STUDIES ON AUSTRALIAN MOLLUSCA. Part XII.

By C. Hedley, F.L.S.

(Plates lxxvii.-lxxxv.)

(Continued from Vol. xxxviii., p.339.)

Leda dasea, sp.nov.

(Plate lxxviii., figs.7, 8, 9.)

Shell rather solid, inflated, trapezoid-ovate, rostrum short and upturned. Sculpture : the entire shell is over-run by fine spaced threads, concentric in early youth. These become oblique in later life, are generally insinuate on the median line, and more abruptly so at the base of the rostrum. Teeth, about twelve on the posterior side, and twenty anteriorly. Shell drawn, 6·2 long, 4 high; depth of single valve 2 mm. Another specimen, length 8, height 5; depth of single valve 2·5 mm.

Hab.—I found a few specimens in 1903, on the beach at Karumba, mouth of the Norman River, Gulf of Carpentaria, Queensland.

This is somewhat the size and shape of *L. verconis* Tate, from which it is readily distinguished by the oblique sculpture and blunt rostrum.

It is worth mentioning here, that the name of *Leda inopinata*, bestowed on a recent Sydney shell in the "Challenger" Report, was lately repeated for a French Tertiary fossil by Mr. Cossmann.* Also that *Leda ramsayi*, another Sydney species discovered by the "Challenger" Expedition, was reported as a Pliocene fossil from Japan by Mr. Yokoyama.†

Leda electilis, sp.nov.

(Plate lxxviii., figs. 10, 11.)

Shell rather solid, inflated, nearly equilateral, elongate with a spout-like rostrum. Colour uniform pale buff. Beak prominent.

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* Cossmann, Bull. Soc. Nantes, ser.2., v., 1908, p.189.

† Yokoyama, Journ. College Science, Tokyo, xxxii., 1911, p.6.

Posterior area large, margined by a ridge radiating from the umbones to the extremity. Lunule narrow, defined by a groove. Posterior dorsal margin excavate, anterior dorsal margin convex, ventral margin gently curved, posteriorly acuminate, anteriorly rounded. Sculptured with close concentric cords, except along the rostrum where there is a smooth ray. Teeth small, about twenty on the anterior side, and sixteen on the posterior. Specimen figured is, in length, 8; height, 4; depth of single valve, 1·7 mm. Another specimen, length, 12; height, 6; depth of single valve, 1·7 mm.

Hab. —Van Dieman's Inlet, 5 fathoms (type), and off the Horsey River, 5 fathoms, mud. Both places in the Gulf of Carpentaria, self, 1903.

This species has a general resemblance to *L. novæguineensis* Smith, but is narrower, more sharply sculptured, and wants the smooth submedian ray. *L. mauritiana* Sowerby, is more inflated, and taller in proportion to length.

LEDA NARTHECIA, sp.nov.

(Plate lxxviii., figs.12, 13, 14.)

Shell rather solid, slightly inequilateral, ovate-acuminate, inflated. Dorsal margin straight, ventral margin curved, posteriorly pointed, anteriorly rounded. Colour lavender-grey dorsally, shading to cream-buff ventrally. Sculpture none, surface very smooth and glossy with an iridescent sheen. Rostrum, lunule, and posterior area not well defined. Beaks full and prominent. Teeth about eighteen on each side. Length, 10·3; height, 6; depth of single valve, 2 mm.

Hab.—In mud, 5 fathoms, off Horsey River, Gulf of Carpentaria, several specimens (self, 1903).

POROLEDA SPATHULA, sp.nov.

(Plate lxxviii., figs.17, 18.)

Leda ensicula Hedley, Mem. Aust. Mus., iv., 1902, p.293, f.41 (not of Angas).

It was kindly explained to me by Mr. Hugh Fulton, that I had fallen into error regarding *Leda ensicula* Angas. The shell which I had so identified is, as he explained, "flatter, more nar-

rowly elongate, with the rostrum much less acute." By the study of an authentic example of *L. ensicula* with which Mr. Fulton favoured me, I am led to the conclusion that the genuine *L. ensicula* is an absolute synonym of *L. lefroyi* Beddome, as Tate and May had already declared it to be. Beddome's name is, consequently, obliterated by priority. For contrast, the authentic specimen of *L. ensicula* referred to is here illustrated (Pl. lxxviii., figs.15, 16); it is 11 mm. long, and 4·5 mm. high, and is labelled as from Port Jackson. I have also seen the species from 63-75 fathoms, off Port Kembla, N. S. Wales, and from the Derwent Estuary, Tasmania.

The species left unnamed is here introduced as *Poroleda spathula;* the type figured is 14 mm. long, and 4·5 high.

I have also taken it outside Sydney Heads, in 80, and in 300 fathoms; and in 40 and 100 fathoms, off Cape Borda, South Australia.

ARCA STRABO, sp.nov.

(Plate lxxviii., figs.19, 20.)

Shell small, solid, obliquely produced posteriorly, very inequilateral, inflated, hinge-line straight, anterior end narrow, rounded, posterior broad and obliquely truncated Epidermis dense, split into long imbricating strips, which conceal the margin Sculpture: low, broad, concentric ridges parting narrow furrows, and traversed by radiate plications. Umbos approximating, prominent, inflated, situated at about one-quarter of the length from the anterior end. Ligamental area very narrow. Hinge with a median toothless space, anteriorly four short irregular teeth, posteriorly about eight narrow, much inclined, elongate teeth. Inner margin of valve smooth, within the pallial line radially scored. Length, 11; height, 6; depth of single valve, 3 mm.

Hab.—Several specimens dredged by self, 1913, from 100 fathoms, north-east of Port Macquarie, N.S.W.(type); and again 111 fathoms, east of Cape Byron, by Mr. G. H. Halligan.

This species belongs to the section *Cucullaria* Conrad, the other recent members of which are *A. sagrinata* Dall, from the West Indies, and the Japanese *A. dalli* Smith.

CRATIS, gen.nov.

A new genus which, in youth, resembles *Philobrya* by crenulated hinge and prodissoconch cap, but, in maturity, approaches *Limarca** by cuboid form, reticulate sculpture, and massive divaricate cardinal teeth. Type *C. progressa*, n.sp. Another species is *Philobrya cuboides* Verco.

CRATIS PROGRESSA, sp.nov.

(Plate lxxix., figs.21, 22, 23.)

Shell inequilateral, rather solid, oblong, inflated, becoming less symmetrical with age. Anterior margin straight, square to the hinge-line, ventral and posterior margins rounded. Prodissoconch hat-shaped, with a broad free rim and a central raised boss. Chondrophore broad, central to the prodissoconch. Primary crenulated teeth evanescent, secondary teeth developed as two massive perpendiculars on the anterior side, and three inclined on the posterior. Medially, the inner margin of the valve is smooth, on either side are half a dozen interlocking tubercles. Height, 4; length, 3·2; depth of single valve, 1·3 mm.

Hab. —100 fathoms, north-east of Port Macquarie, N.S.W. (self, 1913).

This species has assumed a secondary dentition, while the primary or crenulated teeth are in process of disappearing. In the characters, by which it recedes from typical *Philobrya*, it is related to *P. cuboides* Verco.† That South Australian species differs by a smaller prodissoconch, less height in proportion to length, and a smaller size.

MODIOLA PULEX Lamarck.

(Plate lxxix., fig.24.)

In the previous number of this series (*antea*, xxxviii., p.265), the identity of *M. pulex* Lamarck, and *M. crassus* Tenison-Woods, was noted. When that paragraph was written, it was too late to provide an illustration of this unfigured species. The

* *Limarca* Tate, type *L. angustifrons*, a Tertiary fossil, Trans. Roy. Soc. S.A., vii., 1885, p.135, Pl. viii., f.5. There is a resemblance between this figure and that of *Limopsis antillensis* Dall, Bull. Mus. Comp. Zool., xii., 1886, Pl. viii., f.7.

† Verco, Trans. Roy. Soc. S.A., xxxi., 1907, p. 223, Pl. xxviii., f.5-9.

present drawing is of a specimen 23 mm. long, collected by Mr. W. L. May, at Fredrick Henry Bay, Tasmania, and submitted to the Geneva Museum.

In places on the Tasmanian coast, *M. pulex* encrusts the rocks so thickly that the stones appear as if painted black. Though not yet recorded, it will probably be found to reach the southern coast of New South Wales. On further consideration, I would unite *M. ater** as well as *M. crassus* to the synonymy of *M. pulex*.

Codakia pisidium Dunker.

(Plate lxxix., figs.25, 26, 27, 28.)

Lucina pisidium Dunker, Malak. Blatt., vi., 1860, p.227; *Id.*, Moll. Jap., 1861, p.28, Pl.3, f.9.

This species was recorded from Sydney by Angas† as *Lucina parvula* Gould. Though not uncommon, the species is not well known, for the only figure published is poor, and not easily accessible. Figures of a Sydney specimen, 5 mm. long and the same high, are, therefore, here presented.

Joannisiella subquadrata, sp.nov.

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

Shell subquadrate, rather thin, much inflated, slightly excavate on the posterior side, which is bounded by an obscure angle, posterior margin truncate, anterior rounded, ventral straight, dorsal curved. Colour olive-buff. Sculpture fine, close, concentric threads. Umbo prominent, incurved. Two cardinal teeth in each valve. Length, 25; height, 23; depth of single valve, 9 mm.

Hab.—A few separate valves from the beach at Karumba, Gulf of Carpentaria (self, 1903). This is a deeper, squarer shell than *J. oblonga* Hanley, and is somewhat of the same proportions as *J. sphæricula* Desh., than which it is larger and more solid.

Cyamiomactra balaustina Gould.

(Plate lxxvii., figs.2, 3.)

In the preceding volume (p.268), it was noted that my *C. nitida* was synonymous with Gould's species. Figures of the

* Dunker & Zelebor, Verhandl. Zool. Bot. Gesell. Wien, xvi., 1866, p.914.

† Angas, Proc. Zool. Soc., 1867, p.926.

type in the National Museum, Washington, kindly forwarded by Dr. P. Bartsch, are here presented.

Macrocallista sophiæ Angas.

Cytherea sophiæ Angas, Proc. Zool. Soc., 1877, p 176, Pl. 26, fig.23.

This species, described from the neighbourhood of Sydney by Mr. G. F. Angas, was afterwards relegated to the synonymy of *Cytherea hebræa* by Mr. E. A. Smith.*

Discussing the Oriental distribution usually assigned to *C. hebræa*, Dr. H. Lynge† notes that certain writers have remarked it "from the West Indies, but these records are due to its having been confounded with *Cytherea varians* Hanley."

The actual type of *Cytherea hebræa* with Lamarck's autograph label is still preserved in the Geneva Museum. On examination, I found this to answer fairly to *C. varians* as expressed by Römer's figs.4, 4*a*, 4*b* (but not 4*c*) of Plate xxviii., of the Venus Monograph, i., 1867, but Lamarck's shell is a little more inflated and a little higher in proportion to length. Whereas the figures given for *C. hebræa* by Sowerby, Thes. Conch., ii., 1851, Pl.cxxxiv., figs.143, 144, 148, are quite different, both in form and colour, from the type.

The conclusion seems to be that Krebs, Mörch, Simpson and Dall were correct in identifying an American species, ranging from Cape Hatteras to Barbadoes, as *C. hebræa;* that *C. varians* is a synonym of that species, and that the Australian shell may resume the name given to it by Angas.

Lepton concentricum Gould.

(Plate lxxvii., fig.1.)

Lepton concentricum Gould, Proc. Bost. Soc. Nat. Hist., viii., 1861, p.33; *Id.*, Tenison-Woods, These Proceedings, ii., 1878, p.260.

An illustration of this hitherto unfigured species, from the type in the National Museum, Washington, is here supplied by the

* Smith, Chall. Zool., xiii., 1885, p.138.

† Lynge, D., Kgl. Danske Vidensk. Selks. Skrifter, 7 ser., Vol.v., 1909, p.131.

courtesy of Dr. P. Bartsch. I have not yet recognised the species among the fauna of New South Wales; possibly it is exotic. When I saw a single valve, which constitutes the type, I was reminded of *Mysella anomala* Angas. But on comparison of actual specimens by Dr. Bartsch, it proved different.

NEOLEPTON NOVACAMBRICA, sp.nov.

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

Shell small, thin, rounded, rather longer than high, glossy and smooth. Colour white. Faint concentric sculpture. Umbo tumid, prominent. In the left valve, a small posterior and a central arched cardinal with a long thickened anterior limb. In the right, a prominent bifid anterior, and a smaller, simple, posterior cardinal. Height, 2·0; length, 2·2; depth of single valve, 0·6 mm.

Hab.—80 fathoms, 22 miles east of Narrabeen, N.S.W. Numerous specimens.

This is related to *Neolepton antipodum* Filhol,* from New Zealand, which is much larger, more solid, and boldly concentrically sculptured.

ERYCINA HELMSI, sp.nov.

(Plate lxxx., figs.37, 38, 39.)

Shell small, ovate, rather solid and inflated, slightly inequivalve, inequilateral, produced anteriorly, posteriorly and ventrally rounded, umbo prominent. Hinge more developed in the right valve, a minute subumbonal cardinal, and a well developed anterior and posterior lateral in each valve The chondrophore is oblique, and is elongate interiorly and posteriorly. Muscle-scars distinct. Colour buff with irregular purple rays which may coalesce to the exclusion of the ground-colour. Length, 2·5; height, 2·1; depth of single valve, 0·8 mm.

Hab.—Specimens were taken by the veteran conchologist, to whom the species is dedicated, Mr. Richard Helms,† on the *Zostera*-beds at Deewhy Lagoon, N.S.W., in association with

* Hedley, Trans. N.Z. Inst., xxxviii., 1906, p.73, Pl. i., fig.5.

† Since this was written, Mr. Helms died, July 17th, 1914, in his 72nd year.

Potamopyrgus ruppiæ, etc. Twenty years ago, Mr. J. H. Gatliff gave me specimens of this, under another name, from Port Melbourne, Victoria.

LASÆA AUSTRALIS Lamarck.

Cyclas australis Lamarck, Anim. s. vert., v., 1818, p.560; *Pisidium australe* Smith, Journ. Linn. Soc., Zool., xvi., 1881, p.306; *Poronia purpurascens* Deshayes, Tr. elem. Conchyl., i., 1843-50, p.740, Pl. xiv. bis, figs.16-19; *Amphidesma nucleola* Lamarck, Anim. s. vert., v., 1818, p.493(*fide* Récluz, Rev. Zool. Soc. Cuv., vii., 1844, p.328); *Poronia rugosa* Récluz, Journ. de Conch., iv., 1853, p.50, Pl. ii., figs.4, 5; *Poronia scalaris*, *P. parreysii*, and *P. purpurata* Philippi, Zeit. für Malak., iv., 1847, p.72; Smith, Proc. Malac. Soc., iii., 1898, p.23; Gatliff & Gabriel, Vict. Nat., xxxi., 1914, p.84; *Poronia australis* Souverbie, Journ. de Conch, xi., 1863, p.287, Pl. xii., fig.8; *Id.*, Lamy, Bull. du Mus. d'Hist. nat., 1913, p.466.

An interesting review of this species has lately been published by Dr. Ed. Lamy. As his paper may not be readily accessible to Australian conchologists, a summary of it is here offered.

The types of *Cyclas australis*, labelled by Lamarck, and collected by Péron at Timor and King George's Sound, W.A., are preserved in the Natural History Museum of Paris. It is not a fluviatile form, as the name would suggest, but a *Lasæa*, closely related to the European *L. rubra*.

Amphidesma nucleola Lamarck, stated by its author to be a native of the coast of France, is, on the contrary, affirmed by Récluz to be identical with *C. australis*. As the type of that is no longer extant, and as there is some doubt as to its authenticity, and as the name has only page-precedence, not priority, over *C. australis*, it will be safest to disregard it.

Dr. Lamy recommends that the name of *australis* Lamarck, be reserved for the larger and smoother form, and that the smaller variety, with strong concentric sculpture, be named *scalaris* Philippi, 1847 (= *rugosa* Récluz, 1853).

Authorities are divided as to whether the Australian species is identical with, or distinct from, the European. Dr. Dall* has

* Dall, Trans. Wagn. Free Inst. Sci., iii., 1900, p.1163.

arranged the genus as having one member in the northern hemisphere and another in the southern.

EUMONTROUZIERA.

Eumontrouziera, nom.mut. for *Montrouziera* Souverbie, Journ. de Conch., xi., 1863, p.282, Pl xii., fig.5; *Id.*, Hedley, Rec. Austr. Mus., viii., 1912, p.135; *Id.*, Iredale, Proc. Malac. Soc., xi , 1914, p.175; not *Montrouziera* Bigot, Ann. Soc. Ent. France, (3), viii., 1860, p.224.

It was recently pointed out by Iredale, that the name of *Montrouziera* cannot be maintained for the shell, because it was previously appropriated in entomology. My friend invited me to make the necessary correction, and, in accepting this privilege, I desire to maintain a cherished link between this heroic traveller and the science he loved so well. To that end I now propose "*Eumontrouziera.*"

So little has appeared in conchological literature about this remarkable man, that I would take this opportunity to offer a few notes on his career.

Xavier Montrouzier was born at Montpellier, in France, on December 3rd, 1820, and died in his 77th year, at St. Louis, New Caledonia, on May 16th, 1897.

After a brilliant collegiate career, he commenced scientific study in Paris under the celebrated philosopher, Marcel de Serres. From this he withdrew to take up missionary work. In 1844, he was dispatched to Woodlark Island, as one of a pioneering party organised by the Marist Society for service in Melanesia. This party suffered dreadfully; their leader was killed and eaten, whilst Montrouzier himself carried the mark of a spear-thrust to his grave. After most of them had either died of fever or been massacred by cannibals, the remnant was withdrawn.

Even under these difficulties, he found means to gather and publish notes on the Entomology, Ichthyology, Conchology, and Ornithology of Woodlark Island.

In 1846, he was transferred to the healthier, but not less dangerous, post of Balade in New Caledonia, in which island he remained for the rest of his life. As a man of strong character

and disinterested motives, he soon acquired an ascendency over the native tribes.

In a work, "Marins et Missionaires," it is related that it was the patriotic zeal and intelligence of Montrouzier that enabled the French Admiral Febvrier Despointes to anticipate an English annexation of the Isle of Pines. He also was the first to draw attention to the mineral wealth of the island.

In 1855, he was appointed military chaplain at Noumea, but he resumed his missionary work in 1857, at Belep, in 1858 at Lifou, in 1859 at Kanala, and in 1865 at Paita. Returning to official life, he served, from 1872 to 1875, at the penal settlement of Presqu'ile Ducos and Ile Nou, whence he was transferred to the Military Hospital at Noumea. The burden of increasing age, induced his retirement from active service in 1893. In sunshine, among flowers, he spent his declining years, peacefully and happily at the Monastery of St. Louis. His interest in conchology was a pleasure to the last, so that his end was an agreeable contrast to the dangers and hardships of his early life.

Such courage and endurance as his was not excelled by martyrs of the Colosseum. Like them, he was "in journeyings often, in perils of waters, in perils of robbers, in weariness and painfulness, in watchings often, in hunger and thirst, in fastings often, in cold and nakedness."

He wrote comparatively little for publication, but was content to supply other authors from his great store of knowledge and material. The following French Scientific Societies counted him a member, or published his works in their Proceedings:—Société Orientale; Société Linnéenne de Lyon; Académie Scientifique de Lyon; Société Linnéenne de Bordeaux; Société Impériale d'Agriculture, Histoire Naturelle, et des Arts Utiles de Lyon; Académie Scientifique de Montpellier; Société Entomologique de France; Société d'Anthropologie de Paris; and the Academy of Natural Sciences of Philadelphia. His contributions also appeared in the Revue et Magazin de Zoologie and the Journal de Conchyliologie. Either alone, or with collaborators, he wrote sixteen papers on conchology, two on botany, two on entomology, and one on carcinology, besides several on island faunulas.

PANOPÆA ANGUSTA, sp.nov.

(Plate lxxx., figs.40, 41, 42.)

Shell small, thin, oblong, inflated, gaping at each end, but most anteriorly. Colour white. Anterior side a little shorter than the posterior, rounded at each end, excised antero-ventrally. Dorsal margin rather concave. Beak prominent. Cardinal tooth large and projecting. Sculpture consisting of irregular concentric ridges and furrows. Length, 63; breadth, 35; depth of single valve, 13 mm.

Compared with *P. australis* Sowerby,* the new species is more cylindrical, smaller and thinner. Brazier has recorded† *P. australis* from the Sow and Pigs bank, Port Jackson, but that record was based on *P. angusta.* Imperfect shells from Wreck Bay, N.S.W., indicate that *P. australis* reaches north to this State. Under the name of *P. australis*, Valenciennes has described‡ a South African species, which Woodward renamed *P. natalensis*,§ and Sowerby again renamed *P. attenuata.* An extreme variety of *P. australis* is shown under that name by Sowerby, Pl. vi., fig.11, Panopæa, Conch. Icon., xix., 1873. For this, I now propose the name "*spatiosa.*" Sowerby erred in ascribing *P. zelandica* Quoy and Gaimard, to Moreton Bay, Queensland. His *P cancellata*,‖ described as Australian, has not been locally recognised. From external appearance, I should consider that the Table Cape fossil, *Lyonsia agnewi* Ten.-Woods,¶ was a *Lutraria* rather than a *Panopæa*, as it is classed by Tate and Pritchard.

Hab.—One right valve (type) collected at Tewantin, Queensland, by Mr. Carl Laseron. One left valve dredged near North Head, Sydney, by Mr. John Brazier.

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* Sowerby, Genera Rec. and Foss. Shells, i., pt.40, 1834, Pl.32, f.2.

† Brazier, Proc. Linn. Soc. N. S. Wales, ii., 1877, p.371.

‡ Valenciennes, Archiv. du Mus., i., 1839, p.3, Pl.3, f.1; *Id.*, Conch. Illustr., *Panopæa*, 1843, p.3, Pl.8, 11, 12.

§ Woodward, Proc. Zool. Soc., 1855(1856), p.220; Sowerby, Conch. Icon., xix., 1873, Pl. iii.

‖ Sowerby, Conch. Icon., xix., 1873, Pl. iv., f.4.

¶ Proc. Roy. Soc. Tasm., 1875, p.25, Pl. iv., fig.13.

SOLECURTUS TENERIOR, sp.nov.

(Plate lxxx., figs.43, 44.)

Shell small, thin, semitransparent, subcylindrical, rounded at each end, straight on the ventral and postero-dorsal margins, compressed medially. Colour uniform pale buff. Epidermis thin, persistent, slightly wrinkled. Surface glossy. Sculpture, fine, concentric, raised threads. Umbos prominent, at one-third of the total length from the anterior end. Within, a raised rounded clavicle extends from the hinge to the antero-ventral margin. The pallial sinus is short. In the left valve are an anterior vertical and a posterior horizontal cardinal. These are clasped in the right valve by two anterior and posterior cardinals respectively. Length, 31; height, 8·5 mm.

Hab.—Plentiful, as dead shells, on the beach near Cardwell, Queensland (type), and again at Cairns (self, 1901 and 1906).

For *Solecurtus*, the value given by Dall as equivalent to *Pharus*,* is here adopted. This genus does not seem to have been previously noted as represented in Australia. Monographers have so regularly omitted to give characters from the interior of the valve, that comparisons with foreign species are difficult. Perhaps *Cultellus vitreus* Dunker,† from Singapore, is related.

MONTFORTIA SUBEMARGINATA Blainville.

Emarginula subemarginata Blainville, Dict. Sci. Nat., xiv., 1819, p.382; *Id.*, Potiez et Michaud, Galerie de Douai, i., 1838, p.519, Pl. xxxvi., figs.13, 14. *Emarginula emarginata* Blainville, Dict. Sci. Nat., xxxii., 1824, p.291, Pl.68, f.3, and Man. Malac., 1825, p.501, Pl.48 bis, f.3; *Id.*, Deshayes, Encycl. Méth., Vers, ii., 1830, p.109, and Anim. s. vert., vii., 1836, p.584; *Id.*, Rang, Man. Moll., 1829, p.247; *Id.*, Récluz, Rev. Zool., 1843, p.259; *Id.*, Tenison-Woods, Proc. Roy. Soc. Tasm., 1877, p.44. (Not *E. emarginata* Reeve, Conch. Syst., ii., 1842, p.23, Pl. cxl., f.4). *Subemarginula emarginata* Pritchard and Gatliff, Proc. Roy. Soc. Vic., xv., 1903, p.187. *Emarginula australis* Quoy and Gaimard,

* Dall, Trans. Wagner Inst., iii., 1908, p.958.

† Conch. Icon., xix, 1874, Pl. vi., f.22.

Zool. Astrolabe, iii., 1834, p.328, Pl.68, f.11-14; *Id.*, Angas, Proc. Zool. Soc., 1865, p.185. *Subemarginula australis* Shirley, Proc. Roy. Soc. Q'land, xxiii., 1911, p.96.

In 1819, De Blainville described a shell from the collection of Valenciennes, as *Emarginula subemarginata*. He noted it as an aberrant member of the genus, and, in a subsequent review, formed a section "C" to receive a species, *emarginata*, with the peculiarities of *subemarginata*. That the second name was a substitute for the first, is shown by the reference of its popular equivalent, Emarginule échancrée, in the explanation of Conchological Plates 68, both to Vol. xiv.(*subemarginata*) and Vol. xxxii. (*emarginata*).

Transferring the scheme of classification of *Emarginula* from the Dictionary to the Manual, Blainville bestowed upon section "C" a popular designation, "Les Submarginules." His arrangement was copied by Rang. This popular French term has universally, but erroneously, been accepted as the introduction of the generic name "*Subemarginula*." Actually, Gray* seems to have been the first to give Blainville's coinage a Latin form, in 1847, while Herrmannsen† was perhaps the first to advance it acceptably.

Meanwhile, *Hemitoma* was interposed in correct form by Swainson, in 1840, with *tricostata* Sowerby, as the type.‡ But Scudder stated that *Hemitoma* was anticipated, in 1820, by Rafinesque, for a mollusc. Accepting this statement, which I cannot verify, we proceed to consider the next candidate.

Recognising "Les Subemarginules" "as a very natural group," Récluz proposed, in 1843, "to give this new genus the name of *Montfortia*, in honour of Denis de Montfort." His evident intention was to treat *subemarginata* as the type, and this, if it is necessary, it is now declared to be.

Blainville was unacquainted with the origin of his shell. Adams assigned it to Honduras, and Pilsbry to the Florida Keys

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* Gray, Proc. Zool. Soc., 1847, p.147.
† Herrmannsen, Index Gen. Malac., ii., 1849, p.520.
‡ Swainson, Treatise on Malacology, 1840, p.356.

and St. Thomas.* But Deshayes, who was in a position to know, asserted positively that Blainville's shell was identical with *E. australis*, a native of King George's Sound, W.A. Mr. A. U. Henn has sent it to me from Bunbury. The species is a characteristic Adelaidean form, and is absent from Eastern Australia. Angas recorded it from St. Vincent's and Spencer's Gulfs, under Quoy's name. While, under Blainville's second name, the species was extended to Tasmania by Tenison-Woods, and to Victoria by Pritchard and Gatliff. Dr. Shirley's record of *Subemarginula australis* Q. & G., from Cairns, Queensland, is obviously wrong. The first name has been uniformly overlooked by all writers subsequent to the unquoted notice of Potiez and Michaud.

Montfortia aspera Gould.

(Plate lxxvii., fig.4.)

Emarginula aspera Gould, Proc. Bost. Soc. Nat. Hist., ii., 1846, p.154; *Id.*, Am. Expl. Exped., xii., 1852, p.372, Pl.32, f.493,*a*,*b*,*c*. *Emarginula radiata* Gould, Proc. Bost. Soc. Nat. Hist., vii., 1859, p.163.

The types of both *E. aspera* and *E. radiata* came from Sydney Harbour, and I think that variability misled Gould into giving to his own species a second name. Angas† recorded this from Sydney as *E. rugosa* Quoy and Gaimard. I have not any West Australian material of *E. rugosa* for comparison. But if the figures of that in the Astrolabe Atlas are trustworthy, Gould was correct in saying that *E. aspera* had a groove and notch more deeply cleft than that of *E. rugosa*. So few beach-shells range unchanged from Sydney to King George's Sound, that it seems prudent to hold *E. aspera* apart from *E. rugosa* till they can be satisfactorily identified.

On this coast, *M. aspera* is a common shell between tide-marks. In colour and elevation, it is quite variable. The number of prominent ribs increases with age; these are roughened by projecting scales. The size is greater than the records in-

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* Adams, Proc. Zool. Soc., 1851(1852), p.89; Pilsbry, Man. Conch., xii., 1890, p.276.

† Angas, Proc. Zool. Soc., 1867, p.219.

dicate; an example I gathered at Byron Bay, N.S.W., is 22 mm. long, 18 broad, and 12 high.

The type of *E. radiata* Gould, is here figured from an excellent drawing of the type in the Smithsonian Institution, kindly communicated by Dr. P. Bartsch. It is improbable that Pilsbry was correct in uniting the Sydney species to one from Fiji,* which might be *M. cratita* A. Adams.

GIBBULA STRANGEI A. Adams.

(Plate lxxxi., fig.45.)

Monodonta strangei A. Adams, Proc. Zool. Soc., 1851 (1853), p.177; *Gibbula strangei* Angas, Proc. Zool. Soc., 1867, p.217; *Id.*, Fischer, Coq. Viv., 1878, p.329, Pl.102, f.3; *Id.*, Shirley, Proc. Roy. Soc. Q'land, xxiii., 1911, p.96; *Gibbula dacostana* Preston, Proc. Malac. Soc., viii., 1909, p.377, text-fig.

A specimen collected at Caloundra, Queensland, by Mr. Tom Iredale, and identified by him with the type of *G. dacostana* in the British Museum, is here illustrated. I should unite this to the prior *G. strangei*, specimens of which from Queensland only differ from Sydney examples by being rather smaller.

SOLARIELLOPSIS GLYPTUS Watson.

Trochus (Gibbula) glyptus Watson, Journ. Linn. Soc., xiv., 1879, p.694; *Id.*, Chall. Rep. Zool., xv., p.75, Pl. vi., fig.6; *Astele glyptus* Hedley & Petterd, Rec. Austr. Mus., vi., 1906, p.213.

Watson's species was not happily placed in *Gibbula*, and it is now suggested that it may be properly transferred to *Solariellopsis*.† This agrees with *Turcicula* in form and sculpture, but differs from it in being umbilicate. In the South Kensington Museum are two specimens, types, obtained in 410 fathoms off Sydney by the "Challenger." Mr. Petterd and I, about thirty years afterwards, dredged two more in 300 fathoms off Sydney.

TALLORBIS AMPULLUS Tate.

Euchelus ampullus Tate, Trans. Roy. Soc. S.A., xvii., 1893, p.197, Pl. ii., f.5; *Id.*, Shirley, Proc. Roy. Soc. Q'land, xxiv., 1913, p.55.

* Pilsbry, Man. Conch., xii., 1890, p.280.

† Schepman, Siboga Exped. Zool., xlix*a*, 1908, p.53.

This species has not been recorded from this State, but ranges as far south as Sydney. It was collected at the Redbank River by Mr. J. Brazier, and at Woolgoolga by Mr. C. Laseron. Dr. Shirley notes it from Caloundra, Queensland, whence he had previously misidentified it as *Euchelus mysticus* Pilsbry.*

By its author, the species was referred to Pilsbry's *Hybochelus*, but that seems to me synonymous with the prior *Tallorbis*,† a name so obscure as to have been omitted from all zoological indices. The type-species of *Tallorbis*, *T. roseolus* G. and H. Nevill, has been recorded by myself from Masthead Id.,(*antea*, xxxii., p.479) under the later name of *Euchelus lamberti* Souverbie.‡ This also occurs at Lord Howe Island.

A third Australian *Tallorbis* is *T. cancellatus* Krauss, recorded from Port Curtis and Torres Straits by Mr. E. A. Smith.§ This seems to me to be a synonym of the later *Euchelus fossulatus* Souverbie.‖

Alcyna exigua Gould.

(Plate lxxvii., fig.5.)

Last year (xxxviii., p.278) it was explained that *Elenchus exiguus* Gould, was really an *Alcyna*, and was erroneously reported from Sydney. By the courtesy of Dr. P. Bartsch, I am now able to offer a figure of the type in the National Museum, Washington.

Liotia botanica, sp.nov.

(Plate lxxxi., figs.46, 47, 48.)

Liotia clathrata Angas, Proc. Zool. Soc, 1871, p.96; *Id.*, Tate, Trans. Roy. Soc. S.A., xxiii., 1899, p.227; *Id.*, Kesteven, Proc. Linn. Soc. N. S. Wales, xxvi., 1902, p.714; (not *Delphinula clathrata* Reeve, Conch. Icon., i., 1843, Pl. v., f.21).

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* Shirley, Proc. Roy. Soc. Q'land, xxiii., 1911, p.96.

† G. and H. Nevill, Journ. Asiat. Soc. Bengal, xxxviii., 1869, Pt. ii., p. 160, Pl. xvii., f.5.

‡ Souverbie, Journ. de Conch., xxiii., 1875, p.37, Pl. iv., f.4; *op. cit.*, xxvi., 1878, p.210.

§ Smith, Zool. Coll. Alert, 1884, p.76.

‖ Souverbie, Journ. de Conch., xxiii., 1875, p.39, Pl. iv., f.5; *op. cit.*, xxiv., 1876, p.151.

Shell solid, subdiscoidal, convex above. Colour cream. Whorls four and one-half, rather loosely coiled, rounded; the last increases rapidly, slightly ascends, and then suddenly descends to its termination. Sculpture: the whole shell is beautifully and delicately cancellated. There are seven spiral cords, two on the shoulder, three on the periphery, one at the margin of the umbilicus and one within it. The upper pair ascend the spire, the lowest peripheral is stronger than the rest. On the last whorl, there are about twenty radials; these ascend the spire, projecting like spokes over the suture. Arising in the sutural trench, they are dormant on the shoulder, are strongly expressed on the periphery, again fade on the base, but revive in the umbilicus, where they project far into the cavity. At the intersection of the spirals, they form polished knots. A secondary sculpture of fine radial laminæ overruns the whole shell. Aperture circular, oblique, guarded by a broad outstanding varix. Umbilicus broad and perspective. Height, 5; maj. diam., 7; min. diam., 4·5 mm.

Following the determination of Angas, this has been locally known as *L. clathrata* Reeve. But Mr. H. B. Preston, whom I asked to compare the Sydney shell with the type of the reputed Philippine *L. clathrata*, reported that the two are distinct, that "*L. clathrata* has not got the clathrate umbilicus" of the Australian shell. I, therefore, introduce it as a new species. The nearest relations are, perhaps, *L. tasmanica* Ten.-Woods, and *L. subquadrata* Ten.-Woods, which lack the radial sculpture of *L. botanica*.

Hab.—Common around Sydney.

Charisma, gen.nov.

A new genus related to *Liotia*, but without a varix to the outer lip, few-whorled, spirally sculptured, umbilicus with an internal funicle. Operculum corneous, concave, multispiral, with a spiral frilled lamella. Type, *C. compacta*.

Another member of this genus is *C. josephi* Tenison-Woods, originally described as a *Cyclostrema*, transferred, in 1901, by Tate and May to *Collonia*; in 1902, by Pritchard and Gatliff, to

Leptothyra; and, in 1908, by Hedley and May, to *Liotia*. In shell-characters, it is somewhat like *Leptothyra*, from which the operculum immediately and widely separates it. *Isanda* is perhaps related.

CHARISMA COMPACTA, sp.nov.

(Plate lxxxi., fig.49.)

Shell small, solid, turbinate. Colour pale cream. Whorls four, rather loosely coiled, separated by channelled sutures. Spire-whorls smooth, body-whorl sculptured by about twenty regularly spaced, sharp, spiral grooves. Umbilicus about one-eighth of the shell's diameter, its margin smooth and rounded, the aperture-side with an obscure funicle. Aperture descending, circular, inner lip slightly expanded, outer lip simple. Height, 1·9; maj. diam., 2; minor diam., 1·7 mm.

Hab.—100 fathoms, north-east of Port Macquarie (self).

Compared with *Cyclostrema josephi* Tenison-Woods,* the novelty is much smaller, more widely umbilicate, comparatively shorter and broader.

ACMÆA INRADIATA Reeve.

Patella inradiata Reeve, Conch. Icon., viii., 1855, Pl. xxix., figs.77*a*, *b*; *Nacella inradiata* Pilsbry, Man. Conch., xiii., 1891, p.120, Pl. 20, figs.43, 44. *Acmæa crucis* Ten.-Woods, Proc. Roy. Soc. Tasm., 1876 (1877), p.52, 1877, p.44 : May, *op. cit.*, 1902, p.113.

Mr. Tom Iredale writes to me that "*Patella inradiata* (Reeve, Conch. Icon, f.77, 1855) is identical with *Acmæa crucis* Ten.-Woods. Reeve gave no habitat, but the type-tablet in the British Museum is now marked "Tasmania."

Tate and May (*antea*, xxvii., 1901, p.411) reduced *A. crucis* to a synonym of *A. cruciata* Linn., and *A. flammea*, Quoy & Gaimard. Mr. May notes that the type of Ten.-Wood's species is in the Tasmanian Museum, but there are also, in the Australian Museum, two specimens presented by Tenison-Woods, and labelled "type *Acmæa crucis* Tenison-Woods," in his own handwriting.

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* These Proceedings, xxvi., 1900, p.400, f.10.

Acmæa mixta Reeve.

Patelloidea flammea Quoy & Gaimard, Zool. Astrolabe, iii., 1834, p.354, Pl. xxi., figs. 15, 16, 21, 22; *Patella jacksoniensis* Reeve, Conch. Icon., viii., 1855, Pl. xxxix., fig.127*a*, *b*; (not *Patella jacksoniensis* Lesson, Voy. Coquille, ii., 1830, p.418); *Patella mixta* Reeve, *op. cit.*, Pl. xxxix., fig.129, *a*, *b*.

Patelloidea flammea Quoy & Gaimard, is a compound of two species, one of which occurred on the beach at Hobart, and the other at the island of Guam, in the Ladrone Archipelago. Apparently figs.15, 16, 21, and 22 with a subcentral apex, represent the Tasmanian form, but the other figures, 17, 18, 19, 20, with an anterior apex, relate to the Guam species.

As the Tasmanian has other names, while the Guam species has not, it will be proper to leave the name *flammea* for the Ladrone shell, and employ one of the alternatives for the Hobart species. Apparently *Patella jacksoniensis* and *P. mixta* stand next in order, but as the former is disqualified by *P. jacksoniensis* Lesson, the adoption of *A. mixta* is recommended.

Acmæa mufria, sp.nov.

(Plate lxxxi., figs.50, 51, 52.)

Shell rather solid, variable in form, usually elevated and narrow, about as high as broad, and twice as long, the apex in advance of the centre. Colour buff, irregularly rayed with brown, usually the apex, interstices of ribs and central interior being brown. Radial ribs varying from twenty to thirty, low and broad, parted by narrow interstices; in youth, the ribs opaque and interstices translucent. Fine concentric threads overrun ribs and interstices. Muscle-scars distinct. Length, 5·5; breadth, 3; and height, 3 mm. Another specimen, length, 8; breadth, 5; and height, 4 mm.

Hab.—In the rough crust of *Galeolaria cæspitosa*, a gregarious annelid, *A. mufria* is common. I have found it dead frequently in shell-sand at Balmoral Beach, Middle Harbour, and at Wreck Bay, N.S.W.

The relatively coarse radials, narrow elevated form and forward apex, part this from the young of *A. mixta* Reeve.

HELCIONISCUS VARIEGATUS Blainville.

Patella tramoserica Chemnitz, Conch. Cab., xi., 1795, p.179, Pl.197, figs.1912, 1913; *Id.*, Tapparone-Canefri, Zool. Magenta, 1873, p.177; *Id.*, Ten.-Woods, Journ. Roy. Soc. N. S. Wales, xxii., 1888, p.140, Pl.3, f.1, 2, Pl.6, f.8; *Id.*, Pritchard & Gatliff, Proc. Roy. Soc. Vict., xv., 1903, p.191; *Helcioniscus tramosericus* Brazier, These Proceedings, xviii., 1893, p.119; *Id.*, Suter, Proc. Malac. Soc., vi., 1905, p.346; *Id.*, Verco, Trans. Roy. Soc. S.A., xxx., 1906, p.205, and xxxvi., 1912, p.181; *Id.*, Iredale, Trans. N. Z. Inst., xl., 1908, p.380; *Id.*, Shirley, Proc. Roy. Soc. Queensland, xxiii., 1911, p.97. Not *Patella tramoserica* Martyn, Univ. Conch., i., 1784, fig.16; Menke, Moll. Nov. Holland. Spm., 1843, p.33; von Martens, Malak. Blatt., xix., 1872, p.26.

Patella variegata Blainville, Dict. Sci. Nat., xxxviii., 1825, p.100 ; Reeve(?), Conch. Syst., ii., 1842, Pl.136, fig.1. Not *Patella variegata* Reeve, Conch. Icon., viii., 1854, Pl.16, fig.36*a*, *b*, *c* = *eucosmia* Pilsbry, 1891.

Patella jacksoniensis Lesson, Zool. Coquille, ii., 1830, p.418.

Patella diemenensis Philippi, Zeits. f. Malak., 1848, p.162; *Helcioniscus diemenensis* Gatliff & Gabriel, Proc. Roy. Soc. Vict., xxi., 1908, p.382.

Patella antipodum Smith, Zool. Erebus & Terror, 1874, Moll., p.4, Pl. i., f.25; *Helcioniscus antipodum* Suter, Man. N. Z. Moll., 1913, p.79, Pl.7, fig.9.

Patella sp., Maplestone, Month. Microscop. Journ., viii., 1872, p.51, Pl. xxvii., fig.3.

The nomenclature of the common Sydney limpet has been a difficulty to Australian conchologists. Under the name of *Patella tramoserica*, it was excellently figured and described by Chemnitz in 1795, and, until lately, his determination was current.

But unfortunately the original *P. tramoserica*, figured in 1784 by Thomas Martyn, differs widely from the Sydney limpet by being rounder, having the apex more central, fewer bolder ribs, scattered black dots, interior submarginal angle and interior broader, and fewer coloured radials than that of Chemnitz. A minor point is that Martyn misquoted his shell as from North-

West America, where Dr. Dall says it does not exist. Its proper habitat has not yet been recovered.

Deshayes excluded reference to Martyn from the Chemnitzian synonymy, and Menke definitely noted that the species of Martyn was different from that of Chemnitz. Gatliff, Gabriel, and Suter, realising this misuse of Martyn's name, have sought to replace it by one more appropriate. The former advanced *Patella diemenensis* Philippi, an unfigured species, described in 1848 as being common at Hobart. Although Philippi introduced *P. diemenensis*, *P. decora*, and *P. limbata* together, yet he omitted the former when he came to figure the others in the Abbildungen, and possibly doubted that it was a good species. For the New Zealand expression of the so-called *tramoserica*, Suter has accepted *P. antipodum*, proposed in 1874 by Mr. E. A. Smith. In doing so, he is on the firm ground that *antipodum* certainly represents the New Zealand shell.

But prior to Philippi, two names were apparently proposed for the Chemnitzian *tramoserica*, from its original locality, and both writers remarked on the general resemblance it has to the European *P. vulgata*, a remark not applicable to another Australian limpet, thereby fixing its identity satisfactorily. In 1825, Blainville proposed *Patella variegata* for a species from Botany Bay; and, five years later, for a Port Jackson shell, Lesson suggested the name *Patella jacksoniensis*. It is likely that the type of Blainville is preserved in the Museum at Paris, and his name is now recommended for adoption. I agree with Iredale that the New Zealand form is not separable specifically from the Australian. According to Suter, it is rare in New Zealand. Brazier traced it northwards to Moreton Bay. Dr. Verco writes that it becomes small and rare in the Great Australian Bight, and fails to reach Western Australia. Features of the radula are discussed by Tenison-Woods and Maplestone. Brazier, Pritchard and Gatliff gave some references to the literature, which are not here repeated.

It is unlikely that shells so large and conspicuous as *Helcioniscus limbatus* and *Patella neglecta* should have been overlooked by the collectors of Baudin's Expedition. Perhaps study of

Blainville's forgotten species will find among them prior names for these also.

OBTORTIO LUTOSUS, sp.nov.

(Plate lxxxi., fig.53.)

Shell small, subulate. Colour buff, spirally banded with chestnut or varying thence to uniform hazel-brown. Whorls eight, slowly increasing, rounded, parted by impressed sutures. First two whorls smooth, fourth sculptured by four narrow elevated spirals; gradually these increase to fourteen on the last whorl. Sometimes these are overridden by rather irregularly disposed, thin radial lamellæ which decrease upwards, or the radials may be absent. Aperture ovate, outer lip thin, simple. Length, 3·3; breadth, 1·2 mm.

Hab.—Beach, Middle Harbour, Sydney(type), and 5-10 fath. Hope Id., Queensland (self).

This species is close to *O. fulvus* Watson, with which, indeed, it may be found ultimately to intergrade, but the form here described seems to differ constantly and appreciably by being comparatively narrower, with feebler radials or none, and rounder whorls.

PETTERDIANA BRAZIERI Smith.

(Plate lxxxii., fig.55.)

Hydrobia brazieri Smith, Journ. Linn. Soc., Zool., xvi., 1882, p.269, Pl. vii., fig.21 ; *Id.*, Hedley & Musson, Proc. Linn. Soc. N. S. Wales, (2), vi., 1892, p.563; *Amnicola positura* Petterd, Journ. of Conch., iv., 1884, p.159.

From Eidsvold, Queensland, a series of *P. brazieri* were forwarded by Dr. T. L. Bancroft, one of which is here figured. This is the northernmost point to which the species has yet been traced. In the south, it has been gathered by Mr. C. T. Musson at Bective, N.S.W., and its western limit, so far known, is Narrabri, where Mr. Musson also collected it. This range, from the head-waters of the Burnett to those of the Peel, and eastwards to the Clarence and Richmond, is in remarkable disregard of present watersheds. It may be that this distribution was attained when the drainage-plan was different from what it is now.

CERITHIUM TOMLINI, sp.nov.

(Plate lxxxv., fig.89.)

Since writing a note on *Cerithium novæ-hiberniæ* Adams,(*antea*, xxxviii., p.290) I have benefited by correspondence with Mr. J. R. Le B. Tomlin on the subject.

It appears that, in the first place, the name was never published by Arthur Adams, and should be cited as of Sowerby. Secondly, Sowerby, under this name, figured two species, to either of which his vague description might apply. It will be, therefore, advantageous now to declare the type of *Cerithium novæ-hiberniæ* Sowerby, to be that single shell presented to the South Kensington Museum by H. Harvey from the Hanley Collection, and ticketed with an old label on the underside, reading, "novæ-hiberniæ S., eburneus K." This type is the original of fig.84, Pl. clxxx., of the second volume of the Thesaurus. Thirdly, Mr. Tomlin says that this figure 84 is not a good one, and that the original of it is quite different from any form of *eburneum* Brug., and could not be identified with any other *Cerithium* in the Museum. Finally, that the locality "Florida," now attached to the specimen, was merely added by Mr. Smith from the Thesaurus, and that he does not now regard it as reliable.

The other half (Fig.85) of Sowerby's compound species is a shell from the Cuming Collection, and was apparently the original of fig.68, Plate x., of *Cerithium*, in the Conchological Iconica. This species now finds itself without a name, and is here called after the able conchologist who assisted me to unravel its complicated history.

Cerithium tomlini is related to its associate, *C. nodulosum* Bruguière, from which it differs by smaller size, less massive habit, and more numerous, more compressed tubercles.

Mr. G. F. Harris* and Dr. W. H. Dall† point out that Bruguière, who introduced the genus *Cerithium*, indicated no type among the 45 species assigned to it, that Lamarck exercised the privilege of first reviser in 1799, and instituted *Murex aluco*

* Harris, Cat. Tert. Moll. Austr. Brit. Mus., i., 1897, p.224.
† Dall, Proc. Nat. Sci. Philad., 1907, p.364.

Linn., as the type. Vignal* suggests that if Bruguière had indicated a type, that naturally it would have been *C. adansoni.*

Under *Cerithium*, Tryon's Manual includes the following Australian species now assigned to *Clava*—*aspera* Linn., *bitubercu-lata* Sowerby, *fasciata* Brug., *pulchra* A. Adams, *sinensis* Gmelin, and *vertaga* Linn.; also *lævis* Q. & G., for which the genus *Ceratoptilus* was framed by Bouvier in 1886. The latter, which reaches a length of eight inches, seems the largest living member of the family. Fossil members of *Ceratoptilus* are *C. torrii* Tate, 1899, and *C. triserialis* Basedow, 1902.

The novelty may be defined as follows :—

Shell solid, elongate. Colour white with rusty irregular dots or broken lines. Apex of the spire always eroded, whorls estimated at fourteen. Suture undulating. Sculpture: prominent pointed tubercles set on the periphery at about eight to a whorl, on the base are two (rarely one) spiral rows of small tubercles, while small spiral threads overrun the whorls generally. There is an incipient varix, two-thirds of a whorl behind the mouth Last whorl slightly ascending at the aperture, which is a little oblique, externally reflected, with a gutter at the posterior corner. Inner lip well developed, canal short and broad. Length, 32; breadth, 12 mm.

Hab.—The individual figured was collected by myself at Green Island, near Cairns. Dr. A. E. Finckh took the species at Lizard Island, and a small variety only 23 mm. long, occurred to me at Murray Island, Torres Straits.

Bittium granarium Kiener.

(Plate lxxvii., fig.6.)

Cerithium granarium Kiener, Coq. Viv., 1842, p.72, Pl.19, fig.5; *C. lacertinum* Gould, Proc. Bost. Soc. Nat. Hist., vi., 1861, p.386; *Id.*, Sowerby, Conch. Icon., xv., 1865, Pl.18, fig.129.

Gould's species is usually accepted as identical with that of Kiener; this valuation is supported by the present figure of the type of Gould in the National Museum at Washington.

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* Vignal, Journ. de Conch., lviii., 1910, p.138.

Bittium elongatum Sowerby.

(Plate lxxxi., fig.54.)

Cerithium elongatum Sowerby, Thes. Conch., ii., 1855, p.878, Pl.184, figs.233, 234; *Id.*, Conch. Icon., xv., 1865, Pl.xix., fig.136.

In the British Museum is a series, apparently the type of this species, labelled "Sydney, under stones, F. Strange." To facilitate the identification of this, Mr. E. A. Smith kindly allowed me to bring back a specimen, 10 mm. in length, which is here figured.

Search failed to find any Australian shell at all like *B. elongatum*, and, as the Mediterranean is mentioned in the original description, I sought the help of Mr. J. R. Le B. Tomlin in this matter. He kindly replied (5/3/14) that *B. elongatum* is certainly a Mediterranean species, and that it is a shell common at Malta. In collections, it is generally known as *Bittium arenarium* Monterosato, a name which, if published, is doubtless subsequent to *B. elongatum*.

So *Cerithium elongatum* Sowerby, can now be eliminated from the list of Australian shells.

Cymatium australasiæ Perry.

Monoplex australasiæ Perry, Conchology, 1811, Pl.3., fig.3; *Triton olearium* Angas, Proc. Zool. Soc., 1867, p.188; *Id.*, Kesteven, These Proceedings, xxvi., 1902, p.712, Pl. xxxv., figs.4, 5; not *Murex olearium* Linné, *fide* Hanley, Ips. Linn. Conch., 1855, p.287.

Triton acclivis Hutton, Cat. N. Zealand Mar. Moll., 1873, p.13.

(?)*Murex costatus* Born, Index Mus. Cæs. Vindob., 1778, p.295; *Id.*, Brauer, Sitz. Akad. Wiss. Wien, lxxvii., 1878, p.49. Not *Murex costatus* Pennant, Brit. Zool., 1777, p.108, Pl.79.

(?)*Murex parthenopeus* von Salis, Reis Neap., 1793, p.370, Pl. vii., f.1.

(?)*Tritonium simpulum* Bolten, Mus. Bolt., 1798, p.128, for Martini, Conch. Cab., iv., 1780, p.96, Pl.131, figs.1252, 1253.

(?)*Triton succinctum* Lamk., Tabl. Encycl. Méth., 1816, Pl.416, fig.2, and Anim. s. vert., vii., 1822, p.181.

The nomenclature of this species is also in an unsettled condition. Deshayes* considered that, in *T. succinctum*, Lamarck had lumped three species; the first Mediterranean (apparently *parthenopeus* von Salis, 1793), the second Australian (apparently *australasiæ* Perry, 1811), the third American (apparently *americánum* D'Orbigny, 1845). On the contrary, Boog Watson,† though prejudiced in favour of division, was unable to separate the Lamarckian aggregate. For a single species, there is here a discontinuous distribution which is remarkable, as Watson notes that it is absent across the whole Indian Ocean. In Australasia, the range is singularly restricted. Suter‡ cites it from the Bay of Islands to the Hauraki Gulf. Angas found it from Brisbane to Sydney, and I can now add it from the Great Australian Bight, where the "Endeavour" trawled it in 80-120 fathoms.

I have not a series sufficient to decide whether the Sydney shell ought to be reckoned as a geographical race or as an independent species; but which ever it be, the current names cannot be employed. For Hanley has shown that *Murex olearium* Linn., referred to another species than Born's *costatum*. Again, Born's name was preoccupied by Pennant, so that if the species be held to have a world-wide range, the name of von Salis must be used, but, if restricted, that of Perry.

Polinices ephebus, sp.nov.

(Plate lxxxii., figs.62, 63.)

Shell solid, obliquely ovate. Colour ferruginous, shading on the base to buff. Whorls five, the last wound obliquely and rapidly descending, flattened on the shoulder. Suture sharply impressed. Surface in general smooth, under the lens fine growth-lines are crossed by finer dense spiral scratches which become coarser in the umbilicus. Aperture semilunate, the posterior angle filled by a thick callus. This extends to the edge of the umbilicus, continuing in a short brown lobe lightly impressed by a median sulcus. Umbilicus narrow, but deep, containing a large funicle. Height, 31; breadth, 26 mm.

* Deshayes, Anim. s. vert., ix., 1843, p.630, footnote.

† Watson, Chall. Zool., xv., 1886, p.390.

‡ Suter, Manual N.Z. Moll., 1913, p.305, Pl.43, fig.2.

The furrow on the pad suggests a relationship with *P. aulacoglossa* Pilsbry and Vanatta. In size, shape, and general appearance, the nearest is *Natica phytelephas* Reeve,* but that differs by its white colour and unfurrowed pad. In the British Museum, four specimens, apparently part of the same lot as my type, are regarded as unnamed.

Hab.—Dredged by Mr. J. Brazier, in 4 fathoms, mud, off Peat's Ferry, Hawkesbury River, N.S.W.

Scaphella Swainson.

Scaphella Swainson, Zoological Illustrations, 2nd Series, Vol. ii., Part 19, 1832, Plate 87, type, *Voluta maculata* Swainson; (not *Scaphella* of subsequent writers). *Amoria* Gray, Proc. Zool. Soc., 1855, p.64, type, *Voluta turneri* Griffiths and Pidgeon. *Ternivoluta* von Martens, Archiv f. Naturg., lxiii., 1897, p.177, type, *V. studeri* von Martens.

"It is extremely probable," wrote Martin Woodward, "that we are at present incorporating in the Volutidæ several forms derived from distinct stocks."† As the type of Linné's genus *Voluta* is generally agreed to be *Voluta musica*,‡ it is apparent that *Voluta* proper does not occur in Australia, and that other names must be found for the species formerly assigned to that genus.

Searching for the foundations of *Scaphella*, error and disagreement are obvious in literature. So reliable an author as Agassiz§ cites the genus from "Swainson's Elements of Modern Conchology, 1835," and the type is variously given as *junonia* Chemnitz, *undulata* Lamarck, or *papillosa* Swainson. Actually, the type is *V. maculata*, and the genus was introduced in 1832. In the second edition of Swainson's "Exotic Conchology," and of the "Bligh Catalogue" issued by Hanley in 1841, *Scaphella* is defined and used. The first edition of these rare publications is

* Reeve, Conch. Icon., ix., 1855, Pl. xi., fig.42.
† Woodward, Proc. Malac. Soc., iv., 1900, p.124.
‡ Pace, Proc. Malac Soc., v., 1902, p.21.
§ Agassiz, Nomina Syst., 1846, Moll., p.80.

not accessible to me. But it is plain that this second edition was entirely rewritten, and does not represent the nomenclature of the first edition of 1822. For Férussac, minutely reviewing the first four parts of the "Exotic Conchology," failed to note *Scaphella* or *Cymbiola*.* Even in 1824, Swainson† had not decided on the generic subdivision of the Volutidæ.

The original reference to *Scaphella* enumerated *S. undulata*, *junonia*, *maculata*, and *zebra* as typical species, and *papillaris* (=*S. papillosa* Swainson, 1822, not *papillaris* Borson, 1820) and *elongata* (*arabica* Martyn var.) as aberrant species. Afterwards, in his "Treatise on Malacology," 1840, p.318, Swainson redefined the genus, and included in it, *fusiformis*, *undulata*, *volvacea*, *zebra*, *junonia*, and *papillosa*; "the best known type" being(p.107) *S. undulata* Lamarck. Thus compounded, the genus covered, more or less, *Amoria* Gray, *Maculopeplum* Dall,‡ and *Ericusa* H. & A. Adams. Of these, the first should apparently sink as a synonym; *Amoria* Gray, was introduced in 1855, with *Voluta turneri* as the first species generally accepted as type. It is noteworthy that *Scaphella volva* Gmelin, var *turneri* Griffiths & Pidgeon, as originally figured,§ is not the form given under that name by Reeve, Sowerby, and subsequent authors, and is perhaps *Amoria broderipi* Gray.‖ Under the name of *Voluta undulata* Lamarck, Swainson seems to have figured¶ not that, but *Scaphella volva* var. *elliotti* Sowerby.

I suggest that the following Australian shells should be ranked under *Scaphella*: *canaliculata* McCoy, *exoptanda* Sowerby, *gatliffi* Sowerby, *hedleyi* Iredale, *maculata* Swainson, *maria-emma* Gray, *moslemica* Hedley, *prætexta* Reeve, *spenceriana* Gatliff, *studeri* Martens, *translucida* Verco, *undulata* Lamarck, *volva* Gmelin, and its numerous varieties, *zebra* Leach.

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* Férussac, Bulletin des annonces nouv. scient., ii., 1823, p.66.

† Swainson, Quart. Journ. Sci., xvii., 1824, p.31.

‡ Dall, Smithson. Miscell. Coll., Vol.48, 1907, p.370.

§ Griffiths & Pidgeon, Anim. Kingdom, xii., 1834, p.601, Pl.40, f.1.

‖ Gray, Ann. Mag. Nat. Hist.,(3), xiv., 1864, p.237.

¶ Swainson, Exotic Conchology, Part iv., 1823, Pl.27.

Livonia Gray.

Livonia Gray, Brit. Mus. Cat. Volutidæ, 1855, p.8; *Mamillana* Crosse, Journ. de Conch., xix., 1871, p.308, type, *M. mamilla* Sowerby; Tate, Proc. Roy. Soc. N. S. Wales, xxxi., 1898, p.386: *Pterospira* Harris, Brit. Mus. Cat. Tert. Moll. Austr., 1897, p.100, type, *V. hannafordi* McCoy.

Livonia Gray, (not to be confused with *Livona** Gray, 1847) was proposed for *V. mamilla* Sowerby, and *V. dubia* Broderip. As H. & A. Adams had already created *Aurinia*† solely for *V. dubia*, the type of *Livonia* becomes *mamilla*, both by elimination and by first mention.

Mörch‡ has pointed out that, in *Cymbiola*, the specific name *mamilla* is preoccupied by Meuschen§ for the shell later renamed *V. scapha* by Gmelin.

The radula of *L. mamilla* has been shown, by Gatliff & Gabriel, and that of *L. roadnightæ* by Verco, to conform to the pattern of *Cymbiola* rather than to that of *Scaphella*.‖

Livonia seems to be closely related to *Alcithoë*, and more distantly to *Ericusa*. The only recent members of *Livonia* are *L. mamilla* Sowerby, and *L. roadnightæ* McCoy.

Cymbiola Swainson.

Cymbiola Swainson, Zoological Illustrations, 2nd series, Vol. ii., Part xviii., 1832, Pl.83, type, *Voluta vespertilio* Linn., var.; *Scapha* Gray, Proc. Zool. Soc., 1847, p.141, type *V. vespertilio*; *Aulica* Gray, *op. cit.*, type *V. aulica* Sowerby; *Nobilia* Gray, Brit. Mus. Cat. Volutidæ, 1855, p.19; *Ausoba* H. & A. Adams, Gen. Moll., ii., 1858, p 618; *Vespertilio* Cossman, Ess. Pal. Conch., iii., 1899, p.117; *Volutoconus* Crosse, Journ. de Conch., xix., 1871, p.306; Tate, Proc. Roy. Soc. N. S. Wales, xxxi., 1898, p.386, type, *Voluta coniformis* Cox.

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* Iredale, Proc. Malac. Soc., x., 1913, p.309.

† H. & A. Adams, Gen. Rec. Moll., i., p.166, 1853.

‡ Mörch, Cat. Conch. Yoldi, 1852, p.123.

§ Meuschen, Mus. Gevers., 1787, p.328, *Murex mamilla.*

‖ Gatliff & Gabriel, Victorian Naturalist, xxvi., 1909, Plate iii., fig.5; Verco, Trans. Roy. Soc. S.A., xxxvi., 1912, Pl. xvi., f.1.

The history of *Cymbiola* is parallel to that of *Scaphella*. Herrmannsen* ascribed it to the "Elements of modern Conchology," 1835, though it really dates from 1832. Subsequent authors have generally perverted it from the original intention. At first presentation, Swainson included the following Australian species, *C. marmorata*, *nivosa*, *rutila*, *pulchra*, *magnifica*, and *flavicans*. But in the "Treatise on Malacology," 1840, p.317, Swainson gave a fresh definition and list of contents, shifting the genus towards *Adelomelon*, to the misleading of his readers.

I suggest that the Australian contents of the genus be grouped thus; under *Cymbiola* restricted, *irvinæ* Smith, *nivosa* Lamarck, *nodiplicata* Cox, (=*dannevigi* Verco), *oblita* Smith, *perplicata* Hedley, *pulchra* Sowerby, and *rutila* Broderip.

Under the subgenus *Aulica*: *flavicans* Gmelin, *guntheri* Smith, *kreuslerœ* Angas, *magnifica* Chemnitz, *marmorata* Swainson, *punctata* Swainson, and *verconis* Tate.

Under the subgenus *Volutoconus*: *bednalli* Brazier, and *coniformis* Cox.

Ericusa.

Ericusa H. & A. Adams, Genera Rec. Moll. ii., 1858, p.619, for *fulgetrum* Sowerby, and *papillosa* Swainson; *Scaphella* Gray, Brit. Mus. Cat., Volutidæ, 1855, p.20 (not Swainson).

Swainson was oppressed by a craze for arranging species and higher groups in quintettes and circles. Probably both *Scaphella* and *Cymbiola* had a heterogenous content on purpose that they might fill a place in the Quinary System. The group of *Ericusa*, though recognised by systematists, long lacked a name because Swainson placed its members as aberrant *Scaphella*, and Gray reconstituted *Scaphella* to receive them. The names of *Ericusa*, *Livonia*, and *Mamillana* have been uniformly omitted from Zoological Indices. A *Voluta fusiformis* was, in 1814, proposed by Brocchi,† so for the Australian shell named *Voluta fusiformis* by Swainson in 1822, it will be necessary to resume the name *Voluta sowerbyi* of Kiener, 1839.

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* Herrmannsen, Indicis Generum Malac., i., 1846, p.352.

† Brocchi, Conch. foss. sub., 1814, p.315.

To *Ericusa* are assigned : *fulgetrum* Sowerby, *papillosa* Swainson, and *sowerbyi* Kiener.

ALCITHOE H. & A. Adams.

Alcithoë H. & A. Adams, Gen. Rec. Moll., i., 1853, p.164, type *pacifica* (*arabica*) selected by Fischer, Manuel, 1883, p.607.

This genus, which is nearly related to *Adelomelon*, does not seem to occur on the Australian coast. Solander erroneously recorded *V. pacifica* from the Endeavour Reef. The same species, under the name of *V. rossiteri*, was described by Brazier* from Gippsland. Reeve, by mistake, recorded *A. gracilis* Swainson, from Australia. Species from the Australian Tertiary, which have been attributed to the genus, do not seem to be happily placed.

MARGINELLA MALINA, sp.nov.

(Plate lxxxii., fig.65.)

Shell small, rather thin, smooth and glossy, subtriangular in outline, shoulder rounded, apex slightly projecting from a rather flat summit. Colour uniform white. Whorls three, wound nearly in the same plane. Aperture straight, wide, as long as the shell. Outer lip rather broadly expanded. Plications four, narrow, erect, becoming smaller and deeper posteriorly, the last midway along the mouth. A slight glaze on the inner lip. Canal a little produced. Length, 3; breadth, 2·4 mm.

Hab.—I dredged several specimens in 100 fathoms, off Wollongong, and, again, in 80 fathoms, off Narrabeen, N.S.W. (type).

The latter were erroneously catalogued as *M. brazieri* Smith.† That species is a larger shell, with more exsert spire, and lives in deeper water.

MARGINELLA TRANSLUCIDA Sowerby.

(Plate lxxxii., fig.67.)

This species was discussed in the last part of these Studies (xxxviii., p.302). A figure of a specimen 5·5 mm. long, from Sydney, compared with the type in the British Museum, is here presented.

* Brazier, Proc. Linn. Soc. N. S. Wales, xxii., 1898, p.779,

† Hedley, Rec. Austr. Mus., vi., 1907, p.287.

Another member of this genus, hitherto unrecorded for New South Wales, is *M. victoriæ* Gatliff & Gabriel, which I have taken in Middle Harbour.*

MARGINELLA INCONSPICUA Sowerby.

(Plate lxxxii., fig.64.)

Marginella inconspicua Sowerby, Thes. Conch., i., 1846, p.387, Pl.75, fig.80; *Id.*, Reeve, Conch Icon., xv., 1865, Pl.25, fig.141; (not *M. inconspicua* G. & H. Nevill, Journ. Asiat. Soc. Bengal, xliii., 1874, p.23; xliv., 1875, p.95, Pl. viii., figs.10, 11).

This shell was described from an unknown locality. Mr. J. R. Le B. Tomlin informed me that it belongs to the Sydney fauna. By his kind assistance, I am now able to identify it from Ballina, Port Stephens, Port Jackson, Gerringong, N.S.W.; and Schouten Island, Tasmania. It is allied to *M. olivella* Reeve, than which it is about one-half the length, and more attenuate anteriorly. *Marginella evanida* Sowerby, is broader, with outer lip inflected, but closely resembles *M. inconspicua.* A specimen, identified by Mr. Tomlin, is here figured; it is 5·5 mm. long.

MARGINELLA ANGASI Crosse.

(Plate lxxxii., fig.66.)

Marginella angasi Crosse, Journ. de Conch., xviii., 1870, p.304; xix., 1871, p.324, Pl. xii., fig.3 : *Id.*, Watson, Chall. Rep. Zool., xv., 1866, p.266.

This shell is figured as with a single columellar fold, a peculiarity to which Watson has alluded. Through the distribution, by Brazier, of authentic specimens, this species was well known in Australia as with many folds. Impressed by the discrepancy between Brazier's specimens and Crosse's figure, I took examples to Paris. Mr. Dautzenberg, who now owns the "collection du journal" which contains the type, kindly showed it to me. I found that the animal had dried in the aperture of the type-specimen and concealed all the folds but the first, hence the error of the artist. To show the proper disposition of the armature, herewith is figured a shell which I compared, in Paris, with the type of *M. angasi.*

* Gatliff & Gabriel, Proc. Roy. Soc. Vict., xxi., 1908, p.365, Pl.21, fig.5.

In the genus *Marginella*, as at present arranged, are included species with diverse radulæ and opercula.* Probably such dismemberment as has occurred in "*Voluta*" will, therefore, be repeated in *Marginella*.

MARGINELLA MAUGEANA, nom.mut.

Marginella gracilis May, Proc. Roy. Soc. Tasm., 1910 (1911), p.383, Pl. xiii., fig.4; (not *M. gracilis* C. B. Adams, Contributions to Conchology, 1852, p.130).

The name chosen by Mr. May for a shell we dredged off Cape Pillar, happens to have been selected for a Jamaican species sixty years before. In giving it a new name, I have associated it with Réné Mauge, an ardent conchologist on the scientific staff of the "Géographe," who died at Maria Island, 21st Feb., 1802.†

A pathetic story relates how his friend Péron landed on Bruni Island, and gathered treasures by the handful. There was the first recent *Trigonia* a naturalist had ever seen, which Péron at once labelled *Trigonia antarctica*; there was a *Turbo* whose beauty he expressed by the name of "*Eustomiris*," but which Martyn had already called *undulatus*; there was a superb *Venus* (*Salacia disjecta*), besides splendid *Phasianella*, *Trochus*, *Patella*, and *Fissurella*.

To interest his sick colleague, he spread these magnificent shells on his bunk. But poor dying Mauge burst into tears at the thought of his helplessness, when such wonderful shells could be gathered. He insisted on joining the shore-party next day, but he fainted on the beach, and his next journey shorewards was to his grave.

DRILLIA COMMENTICUS, sp.nov.

(Plate lxxxii., fig.59.)

Shell small, solid, narrowly fusiform. Colour uniform cream. Whorls nine. First three small and smooth, next with a dozen prominent curved radial ribs. On the following whorl, a keel arises from the base, reaches the periphery, and, as a conspicuous

* Journ. Roy. Micros. Soc., Ser.2, ii., 1882, p.604.

† Péron, Voy. Terr. Aust., i., 1807, p.240; ii., 1816, p. xxvii.

median keel, descends to the aperture. The upper whorls have a second conspicuous spiral keel below the suture, between which and the peripheral keel lies the fasciole, a third and fainter keel runs below the median. On the body-whorl, there are about a dozen spirals below the main keel. The fasciole is sculptured by transverse crescentic threads becoming weaker on the later whorls. Radial threads also appear over the whole shell. Aperture narrow, notch deep, subsutural, outer lip simple, thin, projecting. Canal broad and short. Length, 4; breadth, 1·5 mm.

Hab.—10 fathoms, off Cape Sidmouth, type, A. U. Henn; 15 fathoms, off the Palm Islands, Queensland (self).

Mr. H. B. Preston reports that he was unable to match this small species in the collection of the British Museum. The sculpture of the fourth whorl is a good recognition-mark for this shell.

Daphnella aculeola, sp.nov.

(Plate lxxxii., fig. 58.)

Shell small, lanceolate-fusiform. Colour buff, stained with ferruginous at the extremities. Whorls eight, the first three minute, smooth, forming the protoconch, the rest sculptured, gradate and rapidly increasing in size. Sculpture: broad peripheral undulations compose radial ribs spaced at ten to a whorl, fine spiral cords continue across both ribs and interstices and extend over the base; of these, the last whorl carries sixteen and the penultimate six, those on the periphery increase in size and sharpen the projection of the ribs. Aperture ovate, outer lip thin, simple, a slight smear of callus on the columella. Canal short, straight, open. Length, 8·5; breadth, 4 mm.

Hab.—Middle Harbour, Sydney (self).

This is a narrower shell than *Daphnella aculeata* Webster, with wider radials and spirals.

Glyphostoma alliteratum, sp.nov.

(Plate lxxxii., figs. 56, 57.)

Shell small, solid, acuminate-fusiform. Colour grey to orange, aperture stained with chocolate, usually an intenser patch anteriorly and posteriorly, frequently a chocolate line upon the base

and ascending the suture. Whorls seven, angled at the shoulder, flattened at the periphery, and excavate at the base. Sculpture: first two whorls smooth, on the next are two spiral cords which multiply as they descend, until, on the last whorl, they amount to eighteen. Of these, three run on the fasciole and ten on the base, those on the periphery overrun the ribs unchanged, and carry minor threads in their interstices. On the peripheral belt are prominent undulating perpendicular ribs, which amount to fourteen on the last whorl. Over all are dense microscopic grains. Aperture small, ovate. Outer lip defended by a prominent varix, sculptured like the rest of the shell, with a smooth upturned and notched margin, grooved within the throat. Sinus subsutural, deep and narrow, a solid coloured callus-patch at the right insertion, on the inner lip a smear of callus. Canal short. Length of the orange specimen figured, 6·3; breadth, 2·8 mm. Another grey specimen, length, 7·5; breadth, 3 mm.

Hab.—I have collected this species at Wreck Bay, Sydney Harbour (type-locality), and Dudley, N.S.W.

Hitherto this species has been confused with *Clathurella bicolor* Angas,* with which it is associated. I am indebted to Mr. Tom Iredale for identifying *C. bicolor* for me by the British Museum type. A specimen so authenticated is here figured (Figs. 60, 61). Compared with *C. bicolor*, the novelty is rather larger, comparatively broader, with more prominent sculpture, and consequently sharper shoulder-angle. The uniform orange colour of the base of *C. bicolor* affords a ready means of recognition.

Both these should, I think, take their place in *Glyphostoma*, in which genus they approach *G. aliceæ* Melvill & Standen, and *G. callistum* Hervier, by form, sculpture, and colour-pattern.

Duplicaria ballina, sp.nov.

(Plate lxxxiv., fig.86.)

No perfect specimens of this distinct species have yet reached me. It is, therefore, provisionally described from beach-worn material. In size and general appearance, it is comparable to

* Angas, Proc. Zool. Soc., 1871, p.18, Pl. i., f.20.

D. ustulata Deshayes, from which it differs by being more slender, and by fewer, wider-spaced ribs.

Shell solid, clavate-fusiform. Colour uniform buff. Whorls about fourteen. At two-thirds of the height of the whorl, a deep groove appears on the interstices, but not on the ribs; this ascends the spire, but is inconspicuous on the earlier whorls. Below the groove, there are eight spiral threads. On the last whorl, these continue to the snout and amount to about thirty. The ribs are polished, well spaced, slightly curved, set obliquely, not continuous from whorl to whorl, vanishing on the base, about twenty to a whorl, rather less on the earlier whorls. Length, 23; breadth, 6 mm.

Hab.—Trial Bay (type), C. Laseron; Ballina, C. Hedley; Caloundra, H. L. Kesteven.

MITRA VOLUCRA, sp.nov.

(Plate lxxxiv., fig.84.)

Shell small, solid, compact, ovate-fusiform. Colour purple-slate or cinnamon, with a narrow pale peripheral band and a pale line below the suture. Five whorls remaining in the decollate specimen studied. Suture channelled. The earlier whorls are sculptured by fine close radial riblets developed on the periphery and vanishing towards the suture. These disappear on the last whorl, which is smooth; between the riblets run spiral threads. Aperture elliptical, plaits four, decreasing anteriorly, canal short. Length, 11; breadth, 5 mm.

Hab.—Woolgoolga, N.S.W.; three beach-worn specimens collected by Mr. Carl Laseron.

This species is superficially like the Tasmanian *M. vincta* A. Adams, but differs by being more solid, by having the suture canaliculate, and by the sculpture.

MITRA ACROMIALIS, sp.nov.

(Plate lxxxiv., fig.85.)

Shell ovate-fusiform, rather thin and light. Colour pale buff. Whorls six, including a smooth protoconch of a whorl and a half, spire gradate. Sculpture: perpendicular ribs widely spaced, about seventeen on the last whorl, diminishing and alternating

in ascent from whorl to whorl, knotted at the shoulder and fading at the base. Spirals occur as six prominent cords on the snout, above which a dozen threads become fainter as they ascend, traverse the interstices but not the ribs; about six of these ascend the spire. Aperture pyriform, lip simple. Columella with four well developed, spaced, oblique plaits. Length, 9·5; breadth, 4 mm.

This is the form mentioned in the Thetis Report,* as a variety of *Mitra tasmanica* Ten.-Woods. On reconsidering a larger series, I now conclude that the northern shell is an independent species, readily separable by its sharp shoulder from the real *M. tasmanica*, which does not extend to New South Wales.

Hab.—Off Cabbage-Tree (type) and Broughton Islands, 35 fathoms; Port Stephens (Museum Expedition of 1880); off Port Kembla, 63-75 fathoms (Thetis); off Wollongong, 100 fathoms; off Sydney, 250 fathoms; and off Narrabeen, 80 fathoms (self).

NODOPELAGIA, gen.nov.

A new genus of the Buccinidæ. Shell very solid, fusiform, with a short canal and longitudinal ribs. Type, *Peristernia brazieri* Angas, Proc. Zool. Soc., 1877, p.171, Pl.26, fig.4.

Loc.—Mouth of the Redbank River, N.S.W.

Absence in *P. brazieri*, of the essential character, plaits on the columella, excludes it both from the family and genus of *Peristernia*, and brings it nearer to *Cominella*.

Melvill† noted *P. brazieri* as a *Peristernia* of slightly doubtful affinity, while Tryon transferred it to *Latirus*.‡

In literature, considerable confusion between the genera *Latirus* and *Peristernia* has occurred. Tryon, for instance, considered that the distinction between them was entirely arbitrary. Yet differential characters are shown by the radula.§

The type of *Latirus* is certainly *L. gibbulus* Gmelin, but the type of *Peristernia* is not so plain. The second of five species,

* Hedley, Mem. Austr. Mus., iv., 1903, p.372.

† Melvill, Mem. Manchester Lit. Phil. Soc.,(4), iv., 1891, pp.368, 385, 407.

‡ Tryon, Man. Conch., iii., 1881, p.93.

§ Cooke, in Melvill, *op. cit.*, p.376.

originally named by Mörch,* as constituting his new genus *Peristernia*, was *Turbinella nassatula* Lamarck. This was selected by H. & A. Adams† to represent the genus, a course followed by Cossmann.‡ As example of *Peristernia*, Fischer§ gave *L. wagneri* Anton, a name not in the original list, but one advanced by Tapparone-Canefri‖ to replace *T. crenulata* Reeve, the first species of Mörch. For better definition, *P. nassatula* is now declared the type of *Peristernia*.

From the original locality, *N. brazieri* ranges north to Ballina and Caloundra, Queensland.

ENGINA GANNITA, sp.nov.

(Plate lxxxiv., fig.87.)

Shell solid, fusiform, acuminate at either extremity. Colour uniform cinnamon-brown. Whorls eight, including a protoconch of three smooth whorls. Suture deeply channelled. Sculpture: undulating radial ribs, about ten to a whorl and set a little obliquely, extend from the suture to the base; both ribs and interstices are traversed by prominent polished spiral cords terminating at the lip; the last whorl carries fifteen of these, and the upper whorls three or four; between the major spirals, run three or four small threads. Aperture oblique, narrowly pyriform, arched posteriorly, outer lip contracted, slightly denticulated by the ends of the spiral cords; within are eight entering ridges, the posterior largest. Inner lip with a free margin for most of its length, medial with four strong plaits, posteriorly a double tooth at the angle and a few small wrinkles. Canal short and open. Length, 15; breadth, 7 mm.

In the British Museum, I failed, after some search, to find a representative of this species. *Engina costata* Pease,¶ is like it in general appearance, and has the same sculpture, but is a more

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* Mörch, Cat. Yoldi Coll., 1852, p.99.

† H. & A. Adams, Gen. Rec. Moll., i., 1853, p.153.

‡ Cossmann, Essais Paléoconch. comp., iv., 1901, p.47.

§ Fischer, Man. Conch., 1884, p.617.

‖ Tapparone-Canefri, Journ. de Conch., xxvii., 1879, p.322.

¶ Pease, Proc. Zool. Soc., 1860, p.142.

obese shell. A species from India, *Ricinula xuthedra* Melvill,* is also somewhat like, but has a minute scaly sculpture wanting in the Australian species, and is, besides, larger, comparatively broader and blunter at the ends. Closest of all to our species is *Tritonidea curtisiana* Smith,† but that is variegated instead of monochrome, smaller, less pointed in front, has the ribs closer and more prominent, and the denticles in the aperture are differently arranged. In the Australian Museum collection, there is a specimen of *E. curtisiana* from W. Australia.

Hab.—The specimen described was dredged by Mr. J. Brazier, in 30 fathoms, off Darnley Island, Torres Straits.

Caducifer decapitata Reeve.

Triton decapitatus Reeve, Conch. Icon., ii., 1844, Pl. xviii., f.85; *T. (Epidromus) decapitatus* Melvill & Standen, Journ. of Conch., viii., 1895, p.110.

At the Palm Islands, Queensland, I found two specimens of this species, which is unrecorded for Australia. But in my Queensland list, these were erroneously noted as *Colubraria tessellata* Reeve.‡

To *Colubraria*, however, I would now refer both *Pisania reticulata* A. Adams, and *Pisania schoutanica* May.

Maculotriton gracilis Sowerby.

(Plate lxxxiv., fig.79.)

Phos gracilis Sowerby, Thes. Conch., iii., 1859, p.91, Pl.222, fig.33.

This rare species escaped the attention of Angas when he collected and catalogued the mollusca of Sydney Harbour. It is related to *Cantharus unicolor* Angas, and *Tritonidea australis* Pease. *M. gracilis* is 12 mm. long, more cylindrical in form, and has finer, closer ribs than its associates. Also *M. gracilis* is uniform cinnamon-brown, *M. unicolor* is straw-yellow, either monochrome or with rusty blotches below the suture, and *M. australis* is chequered buff and chocolate. It is now proposed to

* Melvill, Proc. Manchester Lit. Phil. Soc.,(4), vii., 1893, p.55, Pl. i., f.6.
† Smith, Zool. Coll. Alert, 1881, p.47, Pl. v., f.E.
‡ Hedley, Rep. Austr. Assoc. Adv. Sci., xii., 1910, p.367.

transfer all three to *Maculotriton*, as more suitable for their reception than *Cantharus*. The genus has already been reported from the State as *M. bracteatus* Hinds.*

Probably the genus *Jeannea*† is nearly allied to *Maculotriton*.

ARCULARIA CÆLATA A. Adams, var. TORRESIANA, n.var.

(Plate lxxxiii., fig.76.)

Nassa cœlata A. Adams, Proc. Zool. Soc., 1851(1852), p.97; *Id.*, Reeve, Conch. Icon., viii., 1853, Pl. xx., fig.133.

Shell small, solid, ovate. Whorls six, half of which compose the protoconch. Colour pale buff with a broad orange zone on the upper half of the whorl, and another on the base, white beneath the suture. Sculpture: radial riblets are disposed at the rate of about eighteen to a whorl and are crowded towards the aperture, each expands posteriorly to form a subsutural bead-row. Their interstices are crossed by broken spiral furrows at the rate of sixteen to a whorl. Aperture slightly ascending, varix solid and projecting, outer lip with four interior denticles, inner with a small tubercle at either end. Length, 5; breadth, 2·5 mm.

Hab.—Dredged in 12 fathoms, in Torres Straits, by Mr. J. Brazier.

Mr. G. C. Robson, of the Natural History Museum, London, to whom I referred the form here described, writes that "*N. cœlata* is three times larger, and has more transverse ribs, but is otherwise very near your species; and the latter is probably the young." *N. cœlata* has not previously been recorded from Australia.

ARCULARIA CONOIDALIS Deshayes.

Buccinum conoidale Deshayes, in Bélanger, Voy. aux Indes Orient. Zool., 1833, Pl.3, figs.6, 7; *Id.*, Kiener, Coq. Viv., Buccinum, 1834, p.92, Pl.27, fig.109; *Id.*, Deshayes, Anim. s. vert.,(2), x., 1844, pp.182, 196; *Id.*, Marrat, Proc. Liverpool Geol. Soc., 1879, p.52.

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* Hedley, These Proceedings, xxx., 1905, p.529.

† Iredale, Proc. Malac. Soc., x., 1912, p.220.

Nassa crematа Hinds, Voy. Sulphur Zool., Moll., 1844, p.35, Pl. ix., figs.8, 9; *Id.*, Reeve, Conch. Icon., viii., 1853, Pl. iv., f.26; *Id.*, Melvill & Standen, Journ. Linn. Soc. Zool., xxvii., 1899, p.159; *Id.*, Marrat, Proc. Liverpool Phil. Soc., xxxiii., 1879, p.232.

Nassa ravida (*ranida*) A. Adams, Proc. Zool. Soc., 1851(1852), p.97; *Id.*, Reeve, Conch. Icon., viii., 1853, Pl. xi., figs.68, 74; *Id.*, Brazier, Proc. Linn. Soc N. S. Wales, i., 1876(1877), p.179; *Id.*, Watson, Chall. Rep. Zool., xv., 1886, p.177.

Brazier reported this species as *N. ravida* from 20 fathoms, off Darnley Island, Torres Straits. As *N. crematа*, Melvill & Standen record the species from Albany Pass. I have dredged it off Mapoon in the Gulf of Carpentaria. In the British Museum are two *N. ravida* obtained by Prof. J. B. Jukes, in 7 fathoms, mud, in Port Essington, Northern Territory. On this tablet is a note referring the species to the prior *N. crematа* Hinds. And to a series, probably cotypes of *N. crematа* Hinds, is another note directing the student to *N. conoidalis* Deshayes. It is curious how completely this name of Deshayes has disappeared from modern literature.

Arcularia semigranosa Dunker.

(Plate lxxxiii., fig.78.)

Buccinum semigranosum Dunker, Zeitsch. Malak., 1846, p.170; *Id.*, in Philippi, Abbild. Besch., iii., 1849, pp.45, 68, Buccinum, Pl. i., fig.9, Pl. ii., fig.12; *Id.*, Schmeltz, Mus. Godeff. Cat., 1874, p.124; *Id.*, Marrat, Proc. Liverpool Phil. Soc., xxxiii., 1879, p.232; *Nassa nigella* Reeve, Conch. Icon., viii., 1854, Pl. xxvi., f.173; *Nassa optata* Gould, Proc. Bost. Soc. Nat. Hist., vii., 1860, p.331; *Id.*, Report New York State Museum, xxvii., 1875, p.12; *Id.*, Ten.-Woods, Proc. Linn. Soc. N. S. Wales, ii., 1877(1878), p.257; *Nassa munieriana* Crosse, Journ. de Conch., xii., 1864, p.345, Pl.13, fig.6; *Nassa jacksoniana* Angas, Proc. Zool. Soc., 1867, p.190, and of all Australian writers, but not of Quoy & Gaimard, nor of Kiener.

In cataloguing the mollusca of Port Jackson, Angas treated a common shell as *Nassa jacksoniana*, and for half a century his guidance has been followed in Australia. The French naturalists did not themselves collect the shell thus described. It was par-

ticularly acknowledged that they owed it to the botanist, Mr. Fraser, apparently he who was the first Superintendent of the Sydney Botanic Gardens.

I am disposed to think that it was a foreign shell which Fraser gave to the zoologists of the Astrolabe. For not only does *Buccinum jacksonianum* differ widely in the external sculpture and the armature of the aperture from *Arcularia semigranosa*, with which it has been confounded, but it cannot be matched with any other Australian shell. A species differing from either that of Quoy or of Dunker was figured by Kiener under the name of *Buccinum jacksonianum*. Deshayes, who drew attention to this error, states that Kiener represented Quoy's species by his Fig.119 of *B. polygyratum* var.,* but I see no likeness between the latter and the Astrolabe figure. Marrat supposed that *B. jacksonianum* was a variety of *Nassa monile* Kiener.†

I noticed, in the British Museum, an unnamed series from Bombay, which appeared to be more like *jacksoniana* than any Australian shell. *Nassa jacksoniana* Quoy & Gaimard, is recorded from Ceylon by A. W. Langdon.‡

Dunker gave good descriptions and figures of his species, and properly compared it with its near relation *A. pauperata* Lamk. The locality was unknown to him, but it is worth noting that he had a considerable supply of unlocalised Sydney shells for description. In the same paper are, for instance, *Buccinum parvulum*, and *B. jonasi*.

Nassa nigella was ascribed by its author to New Zealand, but it has not been recovered there, and is now excluded from the New Zealand catalogue. In London, I examined three shells from the Cuming Collection, probably Reeve's types of *nigella*, but not so marked; these I found to be a chestnut monochrome of *semigranosa*, a common form of the Sydney shell.

The type of *Nassa optata* Gould, was collected at Sydney by Dr. W. Stimpson. It has never been figured. In 1863, Gould's collection was transferred to the New York State Museum. On

* Kiener, Coq. Viv. Buccinum, 1834, p.92, Pl.29, fig.119.
† Marrat, Journ. of Conch., i., 1878, p.374.
‡ Langdon, Journ. of Conch., i., 1875, p.72.

application to that institution, Mr. W. G. van Name most kindly sent me an enlarged photograph of the type, here re-drawn (Fig. 78), which suffices to establish the name as a synonym of *A. semigranosa*.

Nassa munieriana Crosse, was described from St. Vincent's Gulf, S.A. The type was presented by Mr. G. F. Angas to the British Museum, where it is now labelled as a synonym of *A. semigranosa*. The figure suggests an abnormal, distorted shell, which perhaps accounts for Watson's mistake in referring it to *N. pauperata*.

The affinities of *A. semigranosa* are, as was recognised by Dunker, Marrat, and Watson, with *A. pauperata*. Both share a smooth space behind the aperture, a subsutural bead-row, and absence of denticles in the aperture; but *A. pauperata* is proportionately broader, absolutely larger, more solid, and generally more highly coloured. For most of their range, the two co-exist, but *A. semigranosa* perhaps extends further east, and *A. pauperata* further west.

A closer relation is *Arcularia tasmanica* Ten.-Woods,* which its author thought might intergrade with *semigranosa*, but which I have not yet found to do so. Tenison-Woods' type of the small, sturdy, southern species is preserved in the Tasmanian Museum, Hobart.† Typically, *A. tasmanica* is shorter, more solid, and more closely ribbed than *A. semigranosa*, is strongly sculptured on the back of the last whorl, where *A. semigranosa* is, as its name implies, smooth, and finally has several teeth in the aperture, while *A. semigranosa* is edentulous. As *A. tasmanica* has not been illustrated, a figure of it is here offered (Fig. 81).

When Angas‡ recorded *Nassa lirella* from S. Australia, he appears to have had *A. tasmanica* before him. The Cumingian specimens of *N. lirella*, probably Reeve's types, which I examined in London, are distinct, being larger and proportionately broader than *A. tasmanica*; further, they are marked "Japan."

* Ten.-Woods, Proc. Roy. Soc. Tasm., 1875 (1876), p. 150.
† May, Proc. Roy. Soc. Tasm., 1902 (1903), p. 108.
‡ Angas, Proc. Zool. Soc., 1880, p. 415.

ARCULARIA PARTICEPS, sp.nov.

Nassa suturalis Forbes, Voy. Rattlesnake, ii., 1852, p.365; *Id.*, var., Reeve, Conch. Icon., viii., 1853, Pl ii., figs.11*a*, 11*b*; *Id.*, var., Angas, Proc. Zool. Soc., 1867, p.190; *Id.*, var., Marrat, Variation of Sculpture in the genus Nassa, 1877, Pl. i., fig.3; *Nassa glans* var. *suturalis* Watson, Chall. Zool., xv., 1886, p.179. Not *Buccinum suturale* Lamarck, Anim. s. vert., vii., 1882, p.269, and Kiener, Coq. Viv., Buccinum, 1834, p.54, Pl.24, fig.96.

Nassa intermedia Angas, Proc. Zool. Soc., 1877, p.180, *op. cit.*, 1878, p.865; *Nassa glans* var. *intermedia* Whitelegge, Proc. Roy. Soc. N. S. Wales, xxiii., 1889, p.248. Not *Alectrion intermedia* Frauenfeld, Novara Exped. Zool. Moll., 1867, Pl.i., fig.2. [Preocc., Forbes, Rep. Brit. Assoc., 1843 (1844), p.190; replaced by *N. suturalis dunkeri* Suter, Trans. N. Z. Inst., xl., 1907 (1908), p.350].

Nassa glans Pritchard & Gatliff, Proc. Roy. Soc. Vict., x., 1898, p.280. Not *Buccinum glans* Linné, 1758.

A shell, common on this coast, was first noticed by Forbes, under the incorrect title of *Nassa suturalis*, as having been taken in 6 fathoms in Port Jackson by H.M.S. "Rattlesnake." This Sydney shell has features in common both with *A. glans* Linné, (as shown by Kiener's fig.52) and with *A. suturalis* Lamarck, (as shown by Kiener, fig.96), to each of which it has been in turn referred, but from each of which it consistently differs. In form and painting, it closely resembles *A. suturalis*, but differs, as Angas observed, by lacking the characteristic sutural bead-row, in which feature it approximates to *A. glans*. The prickles on the anterior outer lip, possessed both by *A. glans* and *A. suturalis*, are evanescent in *A. particeps*, which is more slender than either, and has a broad sutural shelf or gutter.

This Sydney shell is about 30 mm. long and 15 mm. broad; it has been figured by Reeve as "A light variety of *N. suturalis*," and by Marrat as "A narrow variety of *N. suturalis*."

A species with subsutural nodules, localised as from Sydney, was described in 1866 by Dunker and Zelebor as *Alectrion intermedia*, and figured by Frauenfeld the following year. Pease*

* Pease, Amer. Journ. Conch., vii., 1872, p.23.

has correctly stated that this name is an absolute synonym of *suturalis* Lamarck. Suter noticed that it was preoccupied by Forbes, and has proposed a substitute.

It is improbable that *A. intermedia* was taken, as alleged, at Sydney. And Angas went astray in substituting that name in his catalogues for his previous *N. suturalis* var. Since this form is still undistinguished by a name, it is now proposed to call it *A. particeps*. From Sydney, it appears to range east to the Kermadecs and Cuvier Island in New Zealand, south to Port Phillip, Victoria, and west to Port Lincoln, South Australia. Both *A. glans* and *A. suturalis* occur in Queensland; I took the first at the Palm Islands, and the second at Mapoon.

ARCULARIA PILATA, sp.nov.

(Plate lxxxiv., fig.80.)

Shell small, narrowly ovate, rather solid. Colour pale buff, with occasionally a narrow spiral orange line, chocolate at the insertion of the lip and the tip of the canal. Whorls six, the first two and a half composing the protoconch, the rest constricted at the suture. Sculpture: radial ribs, about fourteen to the whorl, run from base to suture, over-riding both ribs and interstices are polished cords, ten on the last whorl, and five on the penultimate; in the meshes formed by the intersection of ribs and cords are fine, crowded, spiral hair-lines, as if neatly brushed. Canal short, a little recurved. Aperture slightly ascending, varix broad and projecting, outer lip with six interior denticles. Length, 5·7; breadth, 3 mm.

Hab.—Several specimens, Torres Straits, 12 fathoms; another, Darnley Island, 30 fathoms, J. Brazier.

A. compacta Angas, has a general resemblance to the novelty, but is half as long again, has a more prominent sculpture, and lacks the fine hair-lines of the secondary sculpture of *A. pilata*.

PYRENE FELINA, sp.nov.

(Plate lxxxiv., figs.82, 83.)

Shell rather thin and light, ovate-acuminate, flattened at the periphery, contracted at the base, spire pointed, later whorls becoming turreted. Whorls eight, the first two smooth, forming

a mucronate protoconch. Colour: on a cream ground, orange-brown is irregularly disposed, with a tendency to colour the ribs but not the interstices, to leave an uncoloured spot on the shoulder of the rib, and to cover the back of the last whorl in torn confused meshes. The interior of the aperture is faint lilac. Sculpture: the six adult whorls carry narrow, distant, radial ribs at about twelve to a whorl, discontinuous from whorl to whorl, projecting at the shoulder, and vanishing on the base. Behind the aperture, five ribs disappear progressively, from the base upwards, leaving a tubercle on the shoulder to represent the last. The general surface is smooth and glossy. Ten spiral furrows are engraved on the base and snout. Aperture rather broad, within the outer lip are eight or ten entering bars increasing posteriorly in size. Inner lip continuing as a free edge, slightly corrugated by contact with the revolving lines of the snout. Length, 15; breadth, 7 mm.

Hab.—Seven specimens, collected by self on the ocean-beach near Cooktown, Queensland.

This species seems related to *P. zebra* Woods,* than which it is larger and differently coloured.

Zafra darwini Angas.

(Plate lxxxiii., fig.74.)

Columbella lentiginosa Reeve, Conch. Icon., xi., 1859, Pl.xxxvii., fig.240; *C. darwini* Angas, Proc. Zool. Soc., 1877, p.181.

A group of Australian brown *Zafra* has received ill-usage in literature, and is now in a confused state. To begin, Reeve, in 1859, figured a shell collected by Strange in Moreton Bay, Queensland, under the name of *Columbella lentiginosa* Hinds. But the shell described under that name by Dr. Hinds,† from Costa Rica, is so unlike the Queensland species, that it is difficult to understand how the mistake occurred. Then, as a corollary to his first error, Reeve redescribed the genuine *C. lentiginosa* as *Columbella guatemalensis*.‡

* Woods, Index Test., 1828, p.13, Suppl., Pl.4, fig. 30; Smith, Proc. Zool. Soc., 1891, p.406.

† Hinds, Zool. Voy. Sulphur, ii., 1844, p.39, Pl.10, figs.21, 22.

‡ Reeve, Conch. Icon., xi., 1859, Columbella, Pl. xxxi., fig.198.

Angas, following Reeve, listed *C. lentiginosa* Hinds, from Moreton Bay and Port Jackson.* Then Brazier reported *C. lentiginosa* as abundant in 10 to 30 fathoms off Darnley Island, Torres Straits. This latter is described below as *Zafra almiranta*. Kobelt and Tryon adopted the expedient of citing the Australian shell as *Columbella lentiginosa* Reeve, not Hinds. But Angas, realising later that Reeve had misrepresented the shell of Hinds, formally proposed to name the Moreton Bay shell, as drawn by Reeve, *Columbella darwini*. In the British Museum are the two types, so marked, of *C. darwini* Angas, presented by the widow of the Rev. T. Lombe Taylor. I have dredged *C. darwini* in 11 fathoms in Port Curtis, and have received it from Stradbroke Island, Moreton Bay. After being led astray in 1867 by Reeve, Angas returned to the subject in 1871, and, renouncing his former error, became involved in another. He "cancelled *C. lentiginosa* as an Australian species," and redetermined, as *C. atrata* Gould, a longitudinally ribbed, olive-brown shell, two lines long, found under stones at Mosman Bay, Port Jackson.† This is the species described below as *Zafra avicennia*.

Columbella atrata Gould,‡ was described from Hong Kong Harbour.

Two specimens, representing Gould's types, are preserved in the Museum of Albany, U. S. Am.,(Report New York State Museum, xxvii, 1875, p.45). At the Natural History Museum, South Kensington, I compared cotypes of *C. atrata* with the Sydney shells which Angas had misidentified as that species. The two I find to be specifically distinct; the Australian shells are more solid, broader, have more prominent and curved ribs, and are paler in colour than *C. atrata*.

To *C. atrata* Gould, Tryon has united *C. pumila* Souverbie, and E. A. Smith,§ in reviewing the South African mollusca, has accepted this reference.

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* Angas, Proc. Zool. Soc., 1867, p.195.

† Angas, Proc. Zool. Soc., 1871, p.89.

‡ Gould, Proc. Bost. Soc., vii., 1860, p.334.

§ Smith, Proc. Malac. Soc., v., 1903, p.374.

But Souverbie's species, *Z. regulus*, seems to me to be more slender and more closely ribbed, and worthy of distinction. From New Caledonia, Souverbie described *Columbella pumila*, but finding that Dunker had appropriated that name for a Japanese species, he altered it to *C. regulus*.*

Brazier† has correctly reported *C. regulus* from several localities in tropical Queensland; Eclipse, Fitzroy, Palm, Barnard, and Home Islands.

At Port Moresby, Papua, I found *C. regulus* to be common; this is the northernmost record for the species.

Tryon, having wrongly united *C. atrata* to *C. pumila*, proceeded to link together *C. lentiginosa*, *C. smithi*, and *C. darwini*.‡

It has already been explained that *C. lentiginosa* is a Central American shell, distinct from the Australian species. Compared with *C. smithi* Angas, *C. darwini* is twice as long, more solid, of another colour and sculpture, and of a more northern habitat. In *C. darwini*, the ribs continue on the back of the last whorl, but in *C. regulus*, *C. smithi*, and *C. avicennia* there is a smooth space behind the aperture.

So that two distinct Australian shells, namely, *Zafra regulus* (my fig.77) and *Z. avicennia* (figs.68, 69), have been mistaken for the Hong Kong *C. atrata* and the American *C. lentiginosa*, while *Z. darwini* (fig.74), *Z. smithi* (fig.75), and *Z. almiranta* (fig.92) have also been involved in this confusion. That others may sort out these species more easily than I have done, all are now here figured.

ZAFRA AVICENNIA, sp.nov.

(Plate lxxxiii., figs.68, 69.)

Shell solid, glossy, ovate-fusiform. Colour uniform cinnamon-brown. Whorls seven, gradate, last inflated at the periphery and contracted at the base. Sculpture: first two smooth, remainder radially ribbed, ribs prominent, as broad as their inter-

* Souverbie, Journ. de Conch., xi., 1863, p.281, Pl. xii., fig.4.; *Id.*, op. cit., xii., 1864, p.41.

† Brazier, Journ. of Conch., ii., 1879, p.189.

‡ Tryon, Man. Conch., v., 1883, p.171.

spaces, discontinuous from whorl to whorl, increasing in thickness as the shell grows, produced to the base, amounting to sixteen on the penultimate; the last five gradually vanish from the base upwards and onwards, leaving a smooth space behind the aperture. Beneath the suture, along all the sculptured whorls, winds a cord less prominent than the ribs, uniting and overriding them. On the anterior extremity are seven small, but sharp, spiral threads, ceasing where the ribs commence. Aperture vertical, narrow, posteriorly channelled, outer lip slightly thickened and everted; within, three small denticles decreasing anteriorly, inner lip with a raised margin plicated by the anterior spirals. Canal short, broad, and slightly recurved. Length, 4·5; breadth, 2·1 mm.

Hab.—Abundant in Port Jackson, under sticks and stones in the zone of the Avicennia mangrove. Compared with its nearest ally, *Z. regulus*, this is a stouter shell, with more widely spaced ribs. Except that the Sydney shell has the ribs a little further apart and knobbed on the summit, it is like Reeve's figure of *C. atomella* (as, but not of Duclos).*

Zafra almiranta, sp.nov.

(Plate lxxxv., fig.92.)

Columbella lentiginosa Brazier, Proc. Linn. Soc. N. S. Wales, i., 1876 (1877), p.228, (not of Hinds).

Shell small, solid, conical. Colour buff with a peripheral and basal row of ferruginous dashes. Whorls six. Sculpture: the first two whorls smooth, remainder radially ribbed. Ribs prominent, widely spaced, fifteen on the last whorl, their tops cut off as a bead-row by a subsutural furrow. The base has six, crowded, spiral cords, of which the smaller inner ones are nodulose at the passage of the ribs. Aperture narrow, several denticles within the outer lip. Length, 3·5; breadth, 1·6 mm.

Hab.—Abundant in 10-30 fathoms, off Darnley Island, Torres Straits (J. Brazier). Named in memory of the ship of Torres, the first European vessel to traverse this Strait.

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* Reeve, Conch. Icon., xi., 1858, Pl. xx., fig.108.

ZAFRA DEBILIS, sp.nov.

(Plate lxxxiii., figs.70, 71.)

Shell small, thin, slender, conical. Colour fawn with an opaque white zone median on the last whorl, and supersutural on the spire; sometimes there is also a white subsutural band, the white being plainer on the ribs than on the interstices. Whorls seven, gradate. Sculpture: first three whorls smooth, remainder radially ribbed Ribs prominent, broad, vertical, spaced by about their breadth, continuing to the grooving at the base and to the aperture, discontinuous from whorl to whorl, amounting to fourteen on the last whorl. A slender subsutural cord connects the tops of the ribs; beyond the ribs on the exterior extremity are eight, fine, spiral striæ. Aperture narrow, vertical, a little sinuous, contracted posteriorly, inner lip with a free elevate edge, outer lip simple, canal short, bent rather sharply backwards. Length, 3·3; breadth, 1·1 mm.

Hab.—Many specimens dredged, by self, off the Hope Islands, North Queensland, in 5-10 fathoms; and one by Mr. A. U. Henn, off Cape Sidmouth, N. Queensland.

Z. phaula Melvill & Standen, from Karachi (Proc. Zool. Soc., 1901, p.405), is similar in general appearance, but *Z. debilis* is more contracted anteriorly, and has a different colour-pattern.

ZAFRA ATKINSONI Tenison-Woods.

(Plate lxxxiii., fig.72.)

It was briefly observed by Tryon,* under the heading of *Columbella speciosa* Angas, that "*Mangelia atkinsoni* Tenison-Woods, is a synonym." But the name published by Tenison-Woods† appeared on 21st March, 1876, and that of Angas‡ on 1st June, 1877, so that *Zafra atkinsoni* must take precedence.

Though the two appear to intergrade, the forms which received these names are not identical, and, in a varietal sense, the name of Angas deserves to be maintained.

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* Tryon, Man. Conch., v., 1883, p.71.

† Tenison-Woods, Proc. Roy. Soc. Tasm., 1875, p.141.

‡ Angas, Proc. Zool. Soc., 1877, p.35, Pl. v., fig.3.

Typical *Z. atkinsoni* is larger, more solid, more constricted, with fewer and more prominent ribs. Since it has not yet been illustrated, I present a figure of an authentic specimen, kindly communicated by the Rev. H. D. Atkinson, whose name it bears. The species in chief, as well as the variety, occur near Sydney.

ZAFRA LURIDA Hedley.

(Plate lxxxiii., fig.73.)

Pyrene lurida Hedley, Proc. Linn. Soc. N. S. Wales, xxxii., 1907, p.510, Pl.17, fig.19.

The variation of related forms is followed by *Z. lurida*. It It may be translucent with opaque white dots on the shoulder, periphery, and base. These dots may be outlined by brown arrow-heads, which again may be united to those above and below by narrowed waved or crooked lines. On a pellucid ground, there may appear a brown peripheral band margined by an opaque white line or dots, as in the figure. The apex is frequently purple.

MUREX PERMÆSTUS, sp.nov.

(Plate lxxxv., fig.91.)

Murex monachus capucinus Chemnitz, Conch. Cab., xi., 1795, p.123, Pl.192, figs.1849, 1850; *Murex capucinus* Kiener, Coq. Viv., Murex, 1843, p.42, Pl. xlv., fig.2; *Id.*, Reeve, Conch. Icon., iii., 1845, Murex, Pl. ii., fig.10; *Id.*, Brazier, Cat. Australian Shells, Murex, 1893, p.58. (Not *Murex capucinus* Lamarck, Anim. s. vert., vii., 1822, p.164).

A large, massive, dark red shell, four and three-quarter inches long, was named *Murex capucinus* by Lamarck. The type of this is still preserved in the Geneva Museum, where I had the privilege of inspecting it, in October, 1912. As the description would suggest, this type proved quite different from that which, both in books and in Museums, is called *Murex capucinus*. Universal error arose from misapprehension of Lamarck's reference to the account of Chemnitz. The different and adult form described and figured by the latter was erroneously cited by Lamarck as "specimen juvenis" of his greater Murex. Reach-

ing the conclusion that *Murex capucinus* Lamarck, (perhaps related to *M. torrefactus* Sowerby, or *Purpura tubulata* Martyn) is distinct from *Murex monachus capucinus* Chemnitz, that the latter has received no other name, and that the polynomial has no standing in nomenclature, it is proper to advance an unnamed Australian species by the new name of *Murex permæstus.*

This tropical species is about the size and shape of *M. denudatus* Perry, but more massive, with the frills suppressed and almost black. Shell very solid, biconical. Colour uniform chocolate-brown to slate-black. Whorls about eight, apex always eroded, contracted below the suture, which undulates across the ribs of the previous whorl. Sculpture : three to each whorl, thick scaly varices, either shorn or with a few short frills, ascending the spire obliquely; these describe a quarter of a revolution. Between the varices are a pair of broadly undulating peripheral ribs. On the last whorl are about twenty spiral cords between which, on the periphery, smaller threads are intercalated. Aperture comparatively small and round, narrowly channelled above, outer lip slightly everted with half-a-dozen entering denticles, inner lip simple, thickened at the margin, and folded over anteriorly. Snout very broad, canal slightly recurved. Figured specimen, 55 mm. long, 27 broad. Another from Port Darwin, 65 mm. long, 33 broad.

Hab.—10 fathoms, off Mapoon, Queensland, (type, figured specimen, dredged by self); crawling on mud, among the mangroves at Cape York; beach, Port Darwin.

Kalydon vinosus Lamarck.

(Plate lxxxv., fig.88.)

In the previous part of this series (*antea*, xxxviii., p.330), the identity of *Buccinum vinosum* Lamarck, with *Purpura littorinoides* Tenison-Woods, was noted. A figure is now presented of a Tasmanian specimen, 14 mm. in length, which was approved as authentic by the Geneva Museum.

The species has two colour-forms; in the type, as the name implies, the interior is purple; in the other, it is yellow. This latter has already been noticed by Crosse as *Ricinula adelaidensis*

var. (*gamma*).* For this yellow-mouthed form, as developed on the rocks at the south head of Wineglass Bay, Tasmania, I now propose the varietal name of *aurea*.

THAIS DISTINGUENDA Dunker & Zelebor.

Purpura hippocastaneum var., Quoy & Gaimard, Zool. Astrolabe, 1834, Moll., Pl.38, figs.1, 3; *Id.*, Kiener, 1836, Pourpre Armigères, Pl. xiii., fig.36; *Id.*, Reeve, Conch. Icon., vii., 1846, Pl. viii., fig.36*a*. *P. distinguenda* Dunker & Zelebor, Verh. Zool.-bot. Gesell. Wien, 1866, p.910; *Id.*, Frauenfeld, Novara Exped., Moll., 1867, p.5, Pl. i., fig.3; *Id.*, Schmeltz, Mus. Godeff. Cat., v., 1874, p.122; *Id.*, Pease, Amer. Journ. Conch., vii., 1872, p.23; *Id.*, Martens in Möbius, Mauritius, 1880, p.234.

Though repeatedly figured, this form was not distinguished from the hippocastaneum medley until the time of the Novara Expedition. Under the heading of *P. stellata* Bolten, it was reported from Port Denison by Schmeltz. But D'Argenville's figure, Pl.17, fig.H, on which Bolten founded *P. stellata* (Mus. Bolt., 1798, p.54), is too obscure for determination, and, in particular, does not agree with the proportions of *T. distinguenda*.

I have taken this species at Murray Island, Torres Straits, whence it ranges south along the Queensland coast.

THAIS KIENERII Deshayes.

Purpura kienerii Deshayes, Anim. s. vert., x., 1844, p.101, for Kiener, *Purpura*, Pl. xi., fig.32; *Purpura biserialis* Schmeltz, Cat. Mus. Godeff., v., 1874, p.123; *P. bitubercularis* var., Smith, Zool. Alert, 1884, p.50; *P. alveolata* Melvill & Standen, Journ. Linn. Soc. Zool., xxvii., 1899, p.162.

Schmeltz records this from Port Denison. Coppinger found it at Port Molle, and I have taken it at Gatcombe Head. It closely resembles *T. pica*, but may be easily distinguished by the throat, which is smooth, where *T. pica* has raised, coloured, revolving threads.

THAIS PICA Blainville.

Purpura pica Blainville, Nouv. Ann. Mus., i., 1832, Pl.9, fig.9; *Id.*, Reeve, Conch. Icon., vii., Pl. viii., fig.36.

* Crosse, Journ. de Conch., xiii., 1865, p.50.

Under the name of *Murex hippocastaneum*, several species were confused by Linné. His five original citations of it were distributed by Deshayes* thus: three are *Drupa ricinus* Linné, one is *Melongena galeodes* Lamarck, and one an unrecognisable figure by D'Argenville. Hanley† observes that, in later publications, Linné altered his mind, and shifted the name to *P. pica* Blainville. So *M. hippocastaneum* can be reduced to a synonym of *D. ricinus* or transferred to *M. galeodes*, but it cannot be altered to *P. pica*, since that species was not included in the original references of 1758.

T. pica occurs along the whole coast of tropical Queensland.

Thais costata Blainville.

Purpura costata Blainville, Nouv. Ann. Mus., i., 1832, Pl. xi., fig.8; *Id.*, Kiener, Purpura, 1836, p.61, Pl.xvii., fig.51; *Id.*, Küster, Conch. Cab., 1858, pp.153, 181, Pl.30, figs.10-12; *Id.*, von Martens, Journ. Linn. Soc. Zool., xxi., 1889, p.179.

P. gradata Jonas, Zeit. f. Malak., 1846, p.14; *Id.*, Philippi, Abbild. Beschr., ii., 1846, p.187, Pl. xv., fig.2; *P. trigona* Reeve, Conch. Icon., vii., 1846, Pl. xi., fig.53.

This species does not seem to have been reported from Australia. It occurred to me at Mapoon and Karumba, in the Gulf of Carpentaria. Shirley‡ quotes *Thais hæmástoma* Linné, from Moreton Bay. This is a Mediterranean species, and it is improbable that it should occur in the Pacific.

Thais aculeata Regenfuss.

Purpura aculeata Regenfuss, Recueil de Coquillages, 1758, p. viii., Pl. ii., fig. xviii.; *Id.*, Deshayes, Anim. s. vert., x., 1844, p.104; *Purpura hippocastaneum* var., Quoy & Gaimard, Zool. Astrolabe, Moll., Pl.38, figs.5, 6; *Id.*, Kiener, Purpura, Pl.12, fig.33; *Id.*, Reeve, Conch. Icon., Purpura, 1846, Pl. viii., fig.34*c*.

From the compound of *M. hippocastaneum* Gmelin, this species, first named by Regenfuss, was rehabilitated by Deshayes. If

* Deshayes, Anim. s. vert., x., 1844, p.65.

† Hanley, Ips. Linnæi Conch., 1855, p.296.

‡ Shirley, Proc. Roy. Soc. Queensland, xxiii., 1911, p.102.

Regenfuss be rejected as not consistently binomial, the name may be cited as of Deshayes.

I have taken this species at Murray Island.

Thais armigera Dillwyn.

Buccinum armigerum Dillwyn, Descrip. Cat. Rec. Shells, ii., 1817, p.612, for Chemn. Conch. Cab., xi., 1795, p.82, Pl.187, figs. 1798, 1799; Reeve, Conch. Icon., Purpura, 1846, Pl. vi., fig.27; Schmeltz, Mus. Godeff. Cat., v., 1874, p.122; Shirley, Proc. Roy. Soc. Queensland, xxiv., 1913, p.56.

Schmeltz records this species from Port Denison. In the South Kensington Museum are two specimens collected by Prof. J. B. Jukes on the reef of Raine Islet.

Thais bufo Lamarck.

Purpura bufo Lamarck, Anim. s. vert., vii., 1822, p.239; *Id.*, Deshayes, x., 1844, p.69; *Id.*, Reeve, Conch. Icon., Purpura, 1846, Pl. ii., fig.7; *Id.*, Roth, Queensland Ethnog. Bull., iii., 1901, p.18; *Id.*, Shirley, Proc. Roy. Soc. Queensland, xxiii., 1911, p.102; *Purpurea grisea* Schmeltz, Cat. Mus. Godeff., v., 1874, p.122.

Deshayes considered that the figures of Kiener do not represent this species. Examples answering to Reeve's figure have been seen by me from Cape Cleveland and Port Curtis. Roth reported it from Cape Grafton, Shirley from Yeppoon, and Schmeltz from Port Denison.

Thais crassulnata, sp.nov.

(Plate lxxxv., fig.90.)

Ricinula fiscellum Reeve, Conch. Icon., ii., 1846, Pl. iv., fig.28; (not *Murex fiscellum* Gmelin, Syst. Nat., xiii., 1791, p.3552); *Purpura fiscella* var., Hombron & Jacquinot, Voy. Pôle Sud, 1853, Pl.22, figs.19, 20; *Murex* (*Ocinebra*) *fiscellum* var., G. & H. Nevill, Journ. Asiat. Soc. Bengal, xliv., 1875, p.83; *Sistrum undatum* var., Smith, Zool. Coll. Alert, 1884, p.51; *Id.*, Proc. Zool. Soc., 1879, p.213, and 1891, p.409.

Two species, figured and described, but polynomially named, by Chemnitz have been confused together, and with others by Lamarck, Blainville, Kiener, Reeve, and most writers on this

genus.* These are *Murex fiscellum*, etc., Conch. Cab., x., 1788, p.242, Pl.160, figs.1524, 1525, and *Murex undatus*, etc., Conch. Cab., xi., 1795, p.124, Pl.192, figs.1851, 1852. For the former, Gmelin's binomial of *Murex fiscellum* is available. As Dr. H. Fischer† points out, there can be little doubt of the identity of *Murex ricinuloides* Quoy & Gaimard, with *M. fiscellum*. But Gmelin's binomial of *Murex undatus* was applied to a species different from that of Chemnitz. Even if the view of Mr. E. A. Smith, that the "undatus" of Chemnitz was legitimate, and could be accepted, it must yield to an earlier *Murex undatus*, interposed by Meuschen‡ eight years before. So that *Murex undatus* of Chemnitz was left nameless till Broderip called it *Murex margariticola*.§ It has also been identified as *Murex lienardi* Crosse.‖

As *Murex margariticola* is extremely variable, the present North Australian form was received as but another phase of that polymorphic species. But it appears to differ not only in a more restricted geographical range, but in fewer and bolder ribs, short and broad shape. It may be defined as follows :—

Shell very solid, subumbilicate, biconical, in outline subrhomboidal. Whorls about seven. Colour externally uniform blackish-brown, aperture edged within by dark purple passing into heliotrope and lilac in the throat. Sculpture: short, thick, widely spaced radial ribs, projecting on the periphery, but vanishing before reaching the base or suture, six on the last whorl. On ascending the spire, these become smaller and more numerous. The entire shell is densely covered by fine spiral threads, on the last whorl forty, and on the penultimate twelve, beset with close minute imbricating scales. Aperture elliptical, subchannelled posteriorly, outer lip denticulated by the spiral sculpture. Four or five small tubercles within the lip. Canal very short, slightly

* von Martens, Malak. Blatt., xix., 1872, p.242.

† Fischer, Journ. de Conch., xlix., 1901, p.105.

‡ Smith, in Gardiner, Fauna Maldive Arch., ii., 1903, p.609. Meuschen Mus. Gever., 1787, p.330.

§ Broderip, Proc. Zool. Soc., 1832, p.177. Sowerby, Conch. Illustr., Murex, fig.21, 1834.

‖ von Martens, in Möbius, Fauna Mauritius, 1880, p.232.

recurved. Umbilicus variable, usually pervious, surrounded by a funicle running into the canal. Length, 32; breadth, 20 mm.

Hab.—Sweers Island (type) and Mornington Island, Gulf of Carpentaria (coll. self), Port Essington and Port Darwin (Alert), Raffles Bay (Hombron and Jacquinot).

THAIS TURBINOIDES Blainville.

Purpura turbinoides Blainville, Nouv. Ann. Mus., i., 1832, p.217; *Id.*, Kiener, Coq. Viv., p.118, Pl.35, fig.82; *P. thiarella* Quoy & Gaimard (not Lamk.), Zool. Astrolabe, ii., 1833, p.571, Pl.39, figs.4, 6; *Murex iostoma* Sowerby, Conch. Illustr., 1834, p.8, Pl. vii., fig.42; [not *Murex iostoma* A. Adams, Proc. Zool. Soc., 1851 (1853), p.267]; *Murex decussatus* Reeve, Conch. Icon., Murex, 1845, Pl. xxxi., fig.153; (not *Murex decussatus* Gmelin, Syst. Nat., xiii., 1791, p.3527); *Purpura stellaris* Hombron & Jacquinot, Moll. Astrol. and Zélée, 1853, Pl. xxii., figs.13, 14; *Id.*, *op. cit.*, Rousseau, 1854, p.88.

This is another species which has been confused with *T. fiscellum*. A specimen of this was collected at Lizard Island, Queensland, by Dr. A. E. Finckh.

SIPHONARIA VIRGULATA, sp.nov.

(Plate lxxxv., figs.96, 97, 98.)

Siphonaria funiculata Angas, Proc. Zool. Soc., 1867, p.232 [not *S. f.* Reeve, Conch. Icon., ix., 1856, Pl. ii., fig.6, nor *S. f.* (=*lirata* Reeve), *op. cit.*, Pl. vii., fig.35]; *Id.*, Henn & Brazier, Proc. Linn. Soc. N. S. Wales, (2), ix., 1894, p.179.

Shell rather thin, almost symmetrical, suborbicular, apex subcentral. Colour: interior with a central bluish callus, surrounded by a broad dark chocolate zone fading externally to pale brown with white dashes on the margin; exterior with apex dark brown, riblets white, their interstices irregularly chocolate. Sculpture: about seventy radial riblets, which narrow and waver as they ascend. Their size is irregular, about a third or fourth riblet being larger than the rest, margin finely denticulate. Siphonal fold slight and shallow. Length, 21; breadth, 19; height, 9 mm.

Hab.—Terrigal, Sydney, and Twofold Bay; in the wash of the surf on ocean-beaches (self).

This was identified by Angas as *S. funiculata* (No.1) of Reeve. But that Tasmanian species differs by being more solid, narrower, taller, with sharper contrast between light and dark stripes, and fewer coarser radials. From the example in South Kensington Museum, I considered that *S. blainvillei* Hanley,* was an elevated form of *S. funiculata.* In the same collection are two tablets of *S. virgulata;* one, a set of four, was from Manly, the other, a set of three, had been first labelled "funiculata," and then corrected to "not funiculata." Nearer to our novelty than *funiculata* is *S. zonata* Ten.-Woods,† which is taller, narrower, darker in colour, more coarsely and evenly sculptured, and ranging from Tasmania to Victoria, and South Australia, being the Adelaidean correspondent of the Peronian *virgulata.*

Besides this misidentification of *S. funiculata*, Angas apparently was mistaken also in recording *S. denticulata*, *S. cochleariformis*, and *S. atra* from New South Wales. After purifying the genus by their exclusion, I can add *Siphonaria stowæ* Verco,‡ of which I have collected several specimens in Middle Harbour.

RETUSA IREDALEANA, sp.nov.

(Plate lxxxv., figs.93, 94.)

Shell small, cylindrical, rounded anteriorly, truncate posteriorly. Colour dull white. Sculpture: fine radial threads which enlarge and curve in on the vertex. Aperture anteriorly pyriform, medially narrow and constricted, posteriorly rising above the last whorl and looped over towards the axis, a small oblique plait on the columella. Spire deeply sunk, the summits of previous whorls visible, sculptured by transverse riblets descending to a papillary apex. Length, 3; breadth, 1·5 mm.

Hab.—Middle Harbour, Sydney (self). This is like *R. amphizosta* from North Queensland, but lacks spiral sculpture, is not as compressed at the waist, has the aperture carried up higher, and the spire more deeply sunk. From Portsea, Victoria, Messrs.

* Hanley, Proc. Zool. Soc., 1858, p.153.

† Ten.-Woods, Proc. Roy. Soc. Tasm., 1877 (1879), pp.47, 99.

‡ Verco, Trans. Roy. Soc. S.A., xxx., 1906, p.223, Pl. vii., f.3-8.

Gatliff & Gabriel* record a variation of *R. amphizosta*, which may possibly be this. *Cylichna atkinsoni* Ten.-Woods,† which also occurs in Sydney Harbour, is larger than *R. iredaleana*, more inflated medially, more contracted posteriorly, with a narrow vertical pore.

Named in honour of Mr. Tom Iredale, and in remembrance of the excellent critical work that he has done on the Australian mollusca.

Ringicula denticulata Gould.

(Plate lxxxv., fig.95)

R. denticulata Gould, Proc. Bost. Soc. Nat. Hist., vii., 1860, p.325; *Id.*, Tenison-Woods, These Proceedings, ii., 1878, p.256.

From Port Jackson, Angas enumerated four species of *Ringicula*, viz., *caron*, *denticulata*, *doliaris*, and *exserta*. As I have already mentioned (*antea*, xxxviii., p.336), his identifications were incorrect; only *R. denticulata* and *R. doliaris* occur here. In the Challenger Reports, *R. doliaris* was figured, but *R. denticulata* has not yet been illustrated. This deficiency is now made good. *R. denticulata* was taken by the Thetis Expedition in 63-75 fathoms, off Port Kembla; it is a rarer shell than *R. doliaris*.

EXPLANATION OF PLATES LXXVII.-LXXXV.

Plate lxxvii.

Fig.1.—Type of *Lepton concentricum* Gould.
Figs.2, 3.—Type of *Kellia balaustina* Gould.
Fig.4.—Type of *Subemarginula radiata* Gould.
Fig.5.—Type of *Elenchus exiguus* Gould.
Fig.6.—Type of *Cerithium lacertinum* Gould.

Plate lxxviii.

Figs.7, 8, 9.—*Leda dysera* Hedley.
Figs.10, 11.—*L. electilis* Hedley.
Figs.12, 13, 14.—*L. narthecia* Hedley.
Figs.15, 16.—*Poroleda ensicula* Angas.
Figs.17, 18.—*Poroleda spathula* Hedley.
Figs.19, 20.—*Arca strabo* Hedley.

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* Gatliff & Gabriel, Proc. Roy. Soc. Vict., xxi., 1908, p.384.
† Proc. Roy. Soc. Tasm., 1876, p.156; 1902, p.113, fig.11.

Plate lxxix.

Figs. 21, 22, 23.—*Cratis progressa* Hedley.
Fig. 24.—*Modiola pulex* Lamarck.
Figs. 25, 26, 27, 28.—*Codakia pisidium* Dunker.
Figs. 29, 30, 31, 32.—*Neolepton novacambrica* Hedley.

Plate lxxx.

Figs. 33, 34, 35, 36.—*Joannisiella subquadrata* Hedley
Figs. 37, 38, 39.—*Erycina helmsi* Hedley.
Figs. 40, 41, 42.—*Panopæa angusta* Hedley.
Figs. 43, 44.—*Solecurtus tenerior* Hedley.

Plate lxxxi.

Fig. 45.—*Gibbula strangei* A. Adams.
Figs. 46, 47, 48.—*Liotia botanica* Hedley.
Fig. 49.—*Charisma compacta* Hedley.
Figs. 50, 51, 52.—*Acmæa mufria* Hedley.
Fig. 53.—*Obtortio lutosus* Hedley.
Fig. 54.—*Bittium elongatum* Sowerby.

Plate lxxxii.

Fig. 55.—*Petterdiana brazieri* Smith.
Figs. 56, 57 —*Glyphostoma alliteratum* Hedley.
Fig. 58.—*Daphnella aculeola* Hedley.
Fig. 59.—*Drillia commenticius* Hedley.
Figs. 60, 61.—*Glyphostoma bicolor* Angas.
Figs. 62, 63.—*Polinices ephebus* Hedley.
Fig. 64.—*Marginella inconspicua* Sowerby.
Fig. 65.—*M. malina* Hedley.
Fig. 66.—*M. angasi* Crosse.
Fig. 67.—*M. translucida* Sowerby.

Plate lxxxiii.

Figs. 68, 69.—*Zafra avicennia* Hedley.
Figs. 70, 71.—*Z. debilis* Hedley.
Fig. 72.—*Z. atkinsoni* Ten.-Woods.
Fig. 73.—*Z. lurida* Hedley, var.
Fig. 74.—*Z. darwini* Angas.
Fig. 75.—*Z. smithi* Angas.
Fig. 76.—*Arcularia cælata* v. *torresiana* Hedley.
Fig. 77.—*Zafra regulus* Souverbie.
Fig. 78.—*Arcularia semigranosa* Dunker; redrawn from a photo of the type of *Nassa optata* Gould.

Plate lxxxiv.

Fig. 79.—*Maculotriton gracilis* Sowerby.
Fig. 80.—*Arcularia pilata* Hedley.
Fig. 81.—*A. tasmanica* Ten.-Woods.
Figs. 82, 83.—*Pyrene felina* Hedley.
Fig. 84.—*Mitra volucra* Hedley.
Fig. 85.—*M. acromialis* Hedley.
Fig. 86.—*Duplicaria ballina* Hedley.
Fig. 87.—*Engina gannita* Hedley.

Plate lxxxv.

Fig. 88.—*Kalydon vinosus* Lamarck.
Fig. 89.—*Cerithium tomlini* Hedley.
Fig. 90.—*Thais crassulnata* Hedley.
Fig. 91.—*Murex permœstus* Hedley.
Fig. 92.—*Zafra almiranta* Hedley.
Figs. 93, 94.—*Retusa iredaleana* Hedley.
Fig. 95.—*Ringicula denticulata* Gould.
Figs. 96, 97, 98.—*Siphonaria virgulata* Hedley.