ART. XLIX.—*The* Mollusca *of the Kermadec Islands.*

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Plates IX–XII.

THE Kermadec Islands form an isolated group in the south-west Pacific Ocean, situated about midway between New Zealand and the Tonga Group. They extend from Sunday Island, in S. lat. 29° 15′, W. long. 177° 59′, about S. 22° W. to French Rock, 227 km. distant. Besides these, in the intervening space, and almost in direct alignment, are Macauley Island and Curtis Island.

The present paper is based mainly on a collection of shells made by R. S. Bell at Sunday Island during 1909 and 1910. I have also had at my disposal a portion of the collection made by the expedition to the Kermadecs in 1908; while Mr. T. F. Cheeseman, F.L.S., F.Z.S., Curator of the Auckland Museum, has kindly allowed me to look over the shells from the Kermadec Islands belonging to the institution under his charge.

A number of specimens of Nudibranchs, Aplysioids, *Cerithiidae*, and other small marine shells still remain to be described. Altogether 261 species, including three found only as fossils in the Kermadecs, are enumerated in the present list, made up as follows: Species already recorded (including four described as new in this paper, but hitherto referred to already-described species)—*Amphineura*, 8; *Gastropoda*, 129 (1 fossil); *Lamellibranchia*, 25; *Cephalopoda*, 16. Species already described and now recorded for the first time from the Kermadec Islands—*Gastropoda*, 36 (2 fossil); *Lamellibranchia*, 5. New species—*Gastropoda*, 37; *Lamellibranchia*, 5.

In the preparation of this paper I have received considerable help from Mr. C. Hedley, F.L.S., of Sydney, to whom I showed a portion of my collection when passing through Sydney in October, 1913. For his invaluable aid, freely given, I beg now to tender my sincere thanks. Mr. T. Iredale, M.B.O.U., of London, has also helped in many points by consulting literature and specimens not available to workers in New Zealand. And I have to thank Mr. H. Suter, of Christchurch, for clearing up a number of points which I submitted to him.

I trust the information I intended to give under each species is clearly stated, but to avoid all misunderstanding the following explanation of the plan of the systematic account is given. In the case of already-described species the reference to the original description is given immediately after the name of the species, and for those species already recorded from the Kermadecs the reference to the work where first so recorded is given. Where no such reference is given it signifies that the species is now recorded from the Kermadec Islands for the first time. With new species I have in all cases described in full a single specimen, the type, which in every case has been deposited in the Canterbury Museum, Christchurch. Also, in all cases of new species the type specimen has been figured. "Habitat" is used strictly in the sense in which it is employed by ecologists—namely, as meaning the station

in which an animal lives; but for the sake of uniformity I have also recorded under the same heading the stations in which dead shells were obtained. In all cases, therefore, where information is given under this head (except where noted "Challenger" Expedition) it signifies that I have actually seen specimens from the Kermadecs of the species in question. Under the heading "Distribution" (as distinct from habitat) I give the places where the species has been found. Where this heading is omitted it signifies that the species is, so far as is known, endemic in the Kermadec Islands.

GASTROPODA.

Scutellastra kermadecensis (Pilsbry).

Patella kermadecensis Pilsbry, "Nautilus," vii, 109, 1894.
Recorded, Pilsbry, *l.c.*

Radula.—Formula $31^{2}1^{2}13$. Rhachidian tooth very small, not nearly reaching to the ends of the laterals. 1st and 2nd laterals, together with the rhachidian, placed anterior to the 3rd lateral and uncini, simple, obtuse; 3rd lateral with 4 cusps, of which the inner one is smallest, the next is largest. Uncini oblique, with 1 cusp.

Shell solid, heavy, broadly oval, narrowed in front. Apex slightly in front of the centre. Slopes straight in all directions. Margin coarsely and irregularly dentate. Height 0·25 to 0·40 of length. *Sculpture:* Shell with raised angular, irregular, radiating ridges, usually only evident at the margin, the greater portion of the upper surface having the ridges obliterated by a covering of shelly matter. Young shell with close irregular high ridges. *Colour:* Upper surface yellowish, but in adult shells the shelly covering usually pale greenish-white. Inner layer porcellaneous white, the muscle-impression often partially or wholly yellow. Margin of interior showing the yellow of the external layer.

Measurements of various shells are here given in tabular form.

Specimen.	Weight.	Length.	Breadth.	Height.	Thickness at Apex.	Ratio Height to Length (L=100).
	Grm.	Mm.	Mm.	Mm.	Mm.	
Young ..	..	68	54	11	..	16
„ ..	..	84	71	20	..	24
High ..	232	122	114	54	9	44
„ ..	193	116	104	56	9	48
Average ..	208	142	121	48	11	34
„ ..	178	149	126	38	8	26
Heavy ..	304	142	117	61	14	43
Largest ..	342	174	160	46	10	26

Habitat.—Abundant living on rocks from just above low-water mark down to 2 m. or 3 m., Sunday Island. The largest specimens have been taken in less than 2 m. of water at low tide. This species lives on the upper surface of the rocks, and the shells are almost invariably covered with coralline and other algae, together with *Siphonaria, Elminius,* and young examples of their own species, all likewise covered with algae. Also found on Macauley Island, Curtis Island, and French Rock.

Fossil.—Small shells occur in fragments of volcanic tuff found on the south-east coast of Sunday Island.

Cellana H. Adams.

Extremely abundant on rocks between tide-marks throughout the Kermadec Islands, the members of this genus constitute a highly variable and puzzling array of forms, diverging into four distinct types, which I have ranked as species. But though typical examples of these four species cannot be confused, and are distinguished by characters of form and sculpture which undoubtedly would be counted as of good specific value in any genus, yet intermediate forms appear so frequently and of such non-characteristic features, and any form merges by so complete a series into each of the others, that it is impossible exactly to define the limits of the species here accepted. But the differences between the extreme forms are so great that it is inconceivable that any one could produce any of the others; consequently I have no hesitation in ranking them as species, notwithstanding the multitude of intermediate variations. Especially bewildering to the despairing systematist are young shells, where nondescript forms inseparable into well-defined groups gradually pass into all four species. This is a suggestive and perhaps significant fact, for it may be that there are four or more species now in course of production in the Kermadec Group, and the form with the least distinctive characters—that which agrees with the type of *C. craticulatus*—possibly approaches most closely to the supposed ancestor. A relationship between variation on the one hand and habitat and distribution on the other is also indicated, for, although all the forms were found on Sunday Island, two only—*C. craticulatus prolixus* and *C. hedleyi*—were there dominant, and these showed a tendency to group themselves in distinct belts, *prolixus* usually occurring higher up on the rocks than *hedleyi*. *C. vulcanicus* was chiefly found on the outlying Meyer Island; *C. hedleyi corrugata* was the only form found on Macauley Island; while *C. scopulinus* alone was collected on French Rock.

To sum up, the examination of ample material leads me to the conclusion that in the Kermadec Group there exist about four species of *Cellana* in process of being formed out of a single species, and the young of all are frequently so much alike that a satisfactory disposition is scarcely possible. I can suggest no explanation of any value as to the cause of this great variability. An inherent tendency to vary which must be postulated for all organisms apparently has had full scope for the production of variants, while, perhaps through the non-arrival of other competitors in the area, selection has not acted on the variable characters. *Cellana* is not the only genus in which apparent unlimited variability has taken place in the Kermadec Islands The case of *Pterodroma neglecta* is perhaps one of the most remarkable among birds. In this species every variation of colour between a uniformly black bird and one all white except the wings and back may be seen during the breeding season at Sunday Island.

Cellana craticulatus (Suter).

Helcioniscus craticulatus Suter, Pro. Mal. Soc., vi, 352, 1905.
Recorded, Suter, *l.c.*

Shell depressed, height 0·24 to 0·32 of length, broadly elliptical, narrowed in front. Apex about one-third the length from the anterior end. Anterior slope nearly straight, posterior slope arched. Margin finely crenulate. *Sculpture:* Exterior with numerous (about 70) close, radiating, small, slightly irregular riblets, made slightly uneven or minutely beaded by concentric growth-lines. *Colour:* Above dark green, variously marked with

blotches of grey or radiating stripes of yellowish. Interior iridescent slaty blue, spatula brown with white centre. Dark colour-markings (seen on holding shell to light) in narrow radiating streaks; sometimes broader bands are faintly indicated.

Length, 25·2 mm. Breadth, 21·4 mm. Height, 7·0 mm.
„ 24·2 mm. „ 20·2 mm. „ 5·8 mm.
„ 27·8 mm. „ 22·7 mm. „ 8·8 mm.

This is a most variable species, to which I assign a multitude of depressed shells which I cannot satisfactorily place under any other species. I would venture to say that its variants afford ample material for the production of all the species of *Cellana* in the Kermadecs.

Habitat.—Abundant living on rocks between tide-marks, Sunday Island; most frequent about half-tide mark.

Subsp. prolixus n. subsp. Figs. 1 and 1*a*.

Description of Type Specimen.—*Shell* depressed, height 0·29 of length, broadly elliptical, slightly narrowed in front. Apex at the anterior fourth. Anterior slope very slightly concave; posterior slope convex above, the lower half straight. Margin crenulate. *Sculpture:* The apical portion is corroded and sharply marked off from the remainder of the shell, which is ornamented by numerous (over 100) fine radiating riblets. These are slightly irregular in size, tending to groups of threes, the central one of which is slightly larger than the others. All are crossed by concentric growth-lines, giving a fine beaded appearance. *Colour:* The apical portion greyish-white with a row of brown spots at the margin. Basal portion pale lemon-yellow, darker above, with numerous radiating narrow brown lines. Interior iridescent lemon-yellow with radiating brown lines, spatula brown with a white centre.

Length, 32 mm. Breadth, 28·2 mm. Height, 9·2 mm.

Variations from Type.—In its typical state this variety is very distinct. On the ground-colour and interior becoming darker it passes over into the typical form. The apex may be quite or not at all corroded. A corroded apex surrounded by a whitish ring showing radiating brown bands is a characteristic feature of this subspecies, and appears frequently in young shells.

Length, 31·4 mm. Breadth, 26·4 mm. Height, 7·4 mm.
„ 27·0 mm. „ 22·5 mm. „ 7·2 mm.
„ 21·5 mm. „ 18·0 mm. „ 5·8 mm.

This subspecies I at first supposed to be the true *craticulatus*, and Iredale also (Pro. Mal. Soc., ix, 72) has confused both this form and *C. scopulinus* with the type of *craticulatus*. By submitting specimens to Mr. Suter I finally had the matter cleared up.

Habitat.—Abundant living on rocks between tide-marks, Sunday Island.

Cellana hedleyi n. sp. Figs. 2 and 2*a*.

Description of Type Specimen.—*Shell* depressed, height 0·24 of length, oval, narrowed in front. Apex about one-fourth the length from the anterior end. Anterior slope nearly straight, posterior slope convex. Margin irregularly crenulate. *Sculpture:* There are 22 broad leading ridges, each with 3 to 5 ribs nearly equal in size and regularly beaded. *Colour:* Above dark yellowish-green with 9 dark brownish-green bands on alternate leading ridges, 4 being directed forwards and 5 backwards from

the apex, thus leaving 3 leading ridges on each side of the apex dark yellowish-green. In addition to the broad bands, there are in the interstices between the ribs numerous narrow reddish-brown streaks leading from the margin towards the apex (seen on holding shell to light in both light and dark areas). Interior iridescent slaty blue, spatula brown.

Length, 42·5 mm. Breadth, 34·8 mm. Height, 10·3 mm.

Variations from Type.—The ridges vary somewhat in height and regularity, and specimens in which they are almost obsolete approach those of *C. craticulatus prolixus* and *C. vulcanicus*. The normal number is apparently 22, though usually more can be counted. The colour-pattern dividing the shell into 22 areas is characteristic of this species. Some New Zealand species exhibit similar pattern. A perfectly regular specimen of *C. hedleyi* shows the central anterior ridge light-coloured, the central posterior ridge dark-coloured. On each side between these the order from the anterior end is dark, light, dark, 3 light, dark, light, dark, light—thus making 22 in all. In old specimens the external surface of the shell is usually corroded and more or less whitish in colour; the anterior, too, is whitish, with the margin clearly showing the ends of the numerous dark streaks.

Length, 45·8 mm. Breadth, 37·5 mm. Height, 14·2 mm.
,, 37·5 mm. ,, 28·7 mm. ,, 9·3 mm.
,, 27·5 mm. ,, 21·6 mm. ,, 5·7 mm.

Habitat.—Living on rocks between tide-marks, Sunday Island. This is the most common limpet on Sunday Island, and occurs generally just above low-tide mark.

Subsp. **corrugata** n. subsp. Figs. 3 and 3*a*.

Description of Type Specimen.—*Shell* moderately high, height 0·32 of length, oval, narrowed and truncated in front. Apex in the anterior third. Anterior and posterior slopes convex. Margin irregularly dentate. *Sculpture:* There are about 27 high angular ridges of varying heights, each bearing 2 to 5 beaded ribs. A beaded rib often in the interstices. *Colour:* Above dark yellowish-green, becoming paler towards the centre. Interior iridescent slaty blue, central portion white. Dark colour-streaks (one in nearly every interstice seen on holding shell to light) reddish-brown, narrow, mostly continuous from near apex to margin.

Length, 38 mm. Breadth, 32·3 mm. Height, 12 mm.

Variations from Type.—Measurements:—

Length, 42·8 mm. Breadth, 37·0 mm. Height, 11·3 mm.
,, 47·8 mm. ,, 42·0 mm. ,, 17·0 mm.
,, 38·8 mm. ,, 31·6 mm. ,, 15·8 mm.

Habitat.—Common living on rocks between tide-marks, Macauley Island, and the only *Cellana* collected there. I have also one specimen from Sunday Island.

Cellana vulcanicus n. sp. Figs. 4 and 4*a*.

Recorded, Iredale, Pro. Mal. Soc., ix, 71, 1910 (*Helcioniscus dirus*).

Description of Type Specimen.—*Shell* high, height 0·42 of length, elliptical, slightly narrowed in front. Apex more than a third of the length from the anterior end. Anterior slope steep, nearly straight; posterior slightly convex. Margin finely crenulate. *Sculpture:* There are about 60 well-marked radiating ribs, alternately high and low, crossed by concentric growth-lines, giving a beaded appearance, The apex is corroded. *Colour:*

Above light yellowish-green. Interior iridescent pearly, the muscle-impression bluish and the spatula brown with a white centre. The margin is marked by numerous short reddish-brown streaks.

Length, 30·2 mm. Breadth, 25 mm. Height, 12·8 mm.

Variations from Type.—The young are prominently ribbed, dark green above and slaty blue within. Old shells are often much corroded, especially above the apex, and are of a pale pearly or whitish appearance within.

Length, 35·2 mm. Breadth, 28·0 mm. Height, 16·3 mm.
,, 32·3 mm. ,, 26·8 mm. ,, 17·8 mm.
,, 27·3 mm. ,, 22·3 mm. ,, 12·8 mm.

A very distinct species, which Iredale referred to *H. dirus* Reeve. In a later communication to me, however, he admits that it differs slightly from that species. As Reeve's species is founded on specimens of unknown locality, and apparently related to a North Atlantic form, I think the proper course is to describe the Kermadec shell as new. The species of *Cellana* are often very restricted in their distribution.

Habitat.—Living on rocks between tide-marks, Meyer Islet. Also collected on Sunday Island.

Cellana scopulinus n. sp. Figs. 5 and 5*a*.

Recorded, Suter, Man. N.Z. Moll., 79, 1913 (*Helcioniscus antipodum*).

Description of Type Specimen.—Shell high, height 0·38 of length, elliptical. Apex acute, in the anterior third. Anterior slope straight, posterior arched. Margin finely crenulate. *Sculpture:* The whole upper surface with close regular radiating ribs crossed by concentric growth-lines, giving a faintly beaded appearance. The ribs not quite equal in size, every third one being slightly larger than the intervening two. *Colour:* Above yellow, darkening towards the apex. Interior bright orange-yellow, paler at the margin and on the muscle-impression, spatula rich brown with white centre. No dark colour-markings.

Length, 35 mm. Breadth, 29·4 mm. Height, 13·4 mm.

Variations from Type.—Large old specimens show the whole outer surface corroded, and sometimes bearing algae and *Elminius;* interior more or less whitish, except the margin, which is yellow, and may show numerous short reddish-brown streaks. Some young specimens show radiating dark colour-streaks. All specimens seen from Sunday Island were young, with radiating dark colour-streaks.

Measurements, French Rock specimens:—

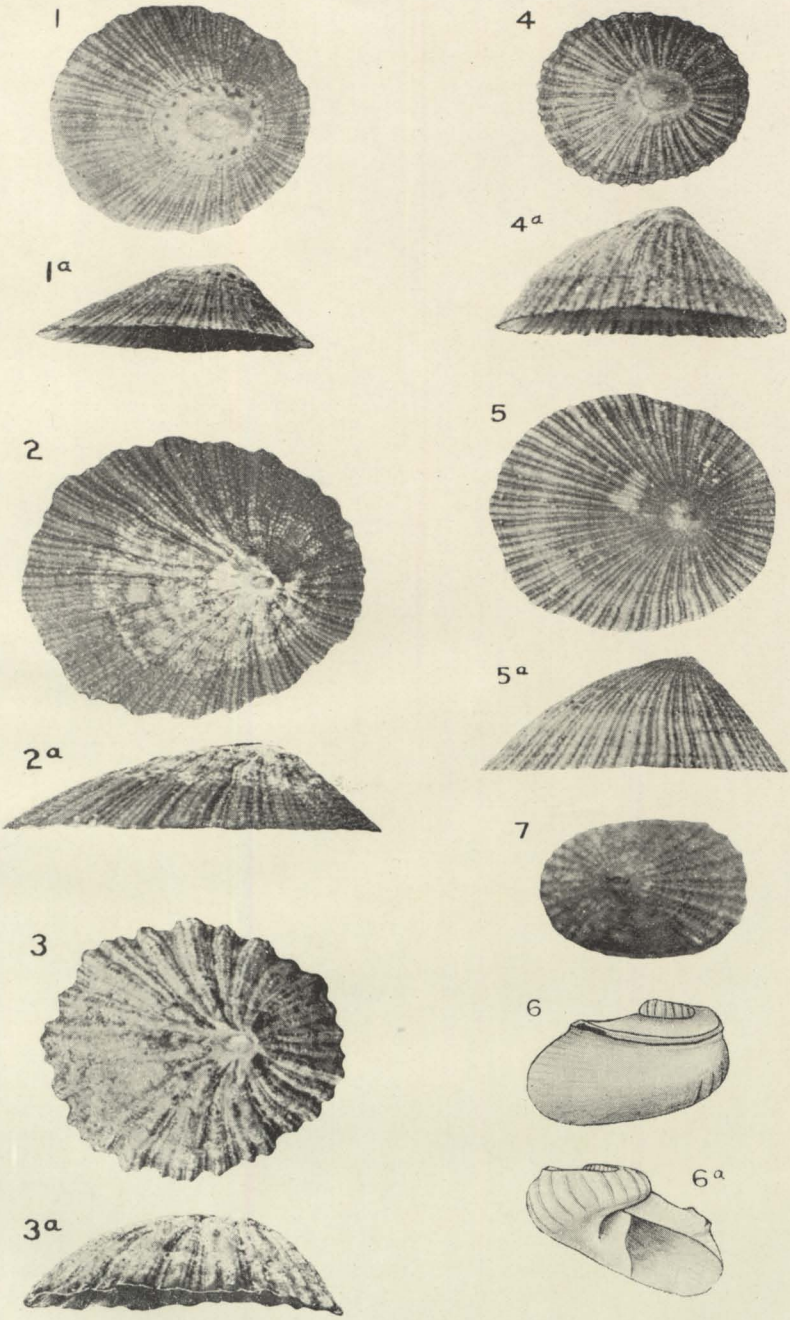
Length, 50·0 mm. Breadth, 42·0 mm. Height, 20·8 mm.
,, 50·6 mm. ,, 42·7 mm. ,, 24·2 mm.

Suter records this species from the Kermadecs as *Helcioniscus antipodum*, but, though young specimens resemble that species somewhat, full-grown examples cannot be confused. Compared with *C. scopulinus*, *C. antipodum* has larger ribs, and the colour-pattern, including about 11 wide dark bands, is quite different. *C. trameroserica* of Australia is apparently identical with Suter's *H. antipodum* of New Zealand.

Habitat.—Common living on rocks between tide-marks, French Rock, and the only species of *Cellana* collected there. Sunday Island; not common.

Schismope pacificus n. sp. Figs. 6 and 6*a*.

Description of Type Specimen. — Shell turbinate, keeled, umbilicate. Spire flattened. Whorls 3, the last rapidly descending. Body-whorl



KERMADEC ISLAND MOLLUSCA.

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strongly keeled midway between the periphery and the suture, the keel double, enclosing the anal perforation, and becoming obsolete near the outer lip. Anal perforation long and narrow, rounded behind, pointed in front. Aperture pyriform, semi-detached. Outer lip at its posterior attachment sharply reflected and spread over the body-whorl till it joins with the inner lip. Umbilicus large, deep. *Sculpture:* There are regular transverse ribs on the apical whorls and part of the periphery of the body-whorl, while the whole shell is crossed by fine spiral striae and faint transverse growth-lines. *Colour* white.

Diameter, 1 mm.

Variations from Type.—The aperture is sometimes quite detached, and the transverse ribs are more prominent in some specimens than in others, while the keel may extend well up the spire.

Habitat.—Dead shells dredged on gravelly bottom in 10 m. to 30 m. near Sunday Island.

Fissuridea bollonsi n. sp. Fig. 7.

Description of Type Specimen. — *Shell* moderately elevated, height 0·41 of length, elongate-elliptical. Apex in anterior third. Anterior slope straight, posterior slightly convex. Margin crenulate. Foramen elongate, the sides parallel at each end, but bowed outwards in the middle third. *Sculpture:* About 40 beaded ribs alternating with an equal number of much smaller beaded riblets. Under the microscope the beads appear as prominent blunt points. *Colour:* Above dirty white, interior white, showing about 10 faint dark bands.

Length, 9·2 mm. Breadth, 6 mm. Height, 3·8 mm.

Variation from Type.—There is some variation in the proportions of the shells, indicated by the following measurements. A few are depressed and elongate-elliptical; a few high, broadly elliptical, with the anterior slope concave and the posterior slope much arched. These latter are old shells, which, from growing normally at first, slightly alter the direction of their sides. Sometimes a distinct horizontal suture is present, as though there had been a resting between two growing periods. Foramen in young specimens well in front of the apex; in adult shells it is at the apex. In many individuals the colour-bands are absent.

Length,	11·0 mm.	Breadth,	7·8 mm.	Height,	4·0 mm.
,,	10·7 mm.	,,	6·6 mm.	,,	3·5 mm.
,,	10·2 mm.	,,	7·2 mm.	,,	6·0 mm.

Habitat.—Living on rocks under a coral-like alga, South Bay, Sunday Island; plentiful.

Tectus royanus (Iredale).

Trochus royanus Iredale, Pro. Mal. Soc., x, 225, 1912.
Recorded, Iredale, *l.c.*

Sculpture: In adult shells the upper surface is invariably covered with algae, coralline and other, while the base usually supports a colony of *Serpulae*. Young shells, however, show the sculpture. Suture well marked. The whorls are flat, with very low rounded nodules along the lower edge, there being about 15 at a distance of 2 cm. from the apex, but sometimes they are so indistinct that they can scarcely be detected. The whole exterior is ornamented by close spiral beaded ribs, about 10 to a centimetre, crossed by diagonal growth-lines, and covered with a white calcareous coating. The base has diagonal growth-lines on a white calcareous covering,

but near the interior, where the coating is absent, it shows regular spiral threads, which are closest along the exterior margin. *Colour* white, interior pearly iridescent, with a well-marked white margin on the exterior of the outer lip.

Height, 77 mm. Major diameter, 84 mm.
" 80 mm. " 97 mm.

A very distinct species, the occurrence of which in the Kermadecs is as remarkable as that of *Scutellastra kermadecensis*, *Cassidea royana*, and *Spondylus raoulensis*. *Tectus royanus* is allied to *T. pyramus* Born, an Indo-Pacific species, but differs in colour and in sculpture, which is much finer than that in *T. pyramus*.

Habitat.—Sunday Island and Meyer Islet. Living on rocks from low-water mark down to 6 m. or 8 m.; fairly plentiful in places, but difficult to collect. One or two live specimens were taken between tide-marks.

Fossil.—A broken shell was extracted from a block of lava lying on the shore on the east side of Sunday Island. The rock was identified as being part of a lava-flow about 50 m. higher up the cliff. (*Trochus* sp. Oliver, Trans. N.Z. Inst., 43, 531.)

Trochus calcaratus Souverbie.

Trochus calcaratus Souverbie, Journ. de Conch., 1875, 41, t. 4, fig. 7.

Fossil.—Fragments taken from hard sandy tuffs of submarine origin on Dayrell Islet, off Sunday Island, agree, so far as they go, with this species. (*Trochus* sp. Oliver, Trans. N.Z. Inst., 43, 527.)

Distribution (Recent).—Lord Howe Island, Australia, New Caledonia, Philippines.

Clanculus atypicus Iredale.

Clanculus atypicus Iredale, Pro. Mal. Soc., x, 225, 1912.
Recorded, Iredale, *l.c.*

Habitat.—Living under stones near low-water mark, Coral Bay, Sunday Island. On stones in rock-pools, Meyer Island.

Clanculus stigmatarius A. Adams.

Clanculus stigmatarius A. Adams, Pro. Zool. Soc., 1851, 161, 1852.

Fossil.—One shell taken from hard sandy tuffs of submarine origin on Dayrell Islet, near Sunday Island. Specimen not quite typical. (*Clanculus* sp. Oliver, Trans. N.Z. Inst., 43, 527.)

Distribution (Recent).—Australia, New Caledonia, Western Pacific, Philippines.

Solariella incerta (Iredale).

Monilea incerta Iredale, Pro. Mal. Soc., x, 226, 1912.
Recorded, Iredale, *l.c.*

Habitat.—Living among rocks between tide-marks, Sunday Island.

Gena oliveri Iredale.

Gena oliveri Iredale, Pro. Mal. Soc., x, 226, 1912.
Recorded, Iredale, *l.c.*

Habitat.—Living among rocks near low-water mark, Sunday Island.

Very closely allied to a species in Norfolk Island, which differs principally in having fine close spiral striae.

Angaria tyria (Reeve).

Delphinula tyria Reeve, Pro. Zool. Soc., 1842, 102, 1843.
Recorded, Iredale, Pro. Mal. Soc., ix, 71, 1910.

Habitat.—Living among rocks near low-water mark, Meyer Island; not common.

Distribution.—Australia.

Angaria distorta (Linné).

Turbo distorta Linné, Syst. Nat., ed. x, p. 764, 1758.
Recorded, Iredale, Pro. Mal. Soc., ix, 71, 1910.

Habitat.—One shell found on beach, Sunday Island (Iredale).

Distribution.—Indian Ocean.

Philorene gen. nov.

Shell subdiscoidal, the body-whorl descending, umbilicate; spire depressed; whorls rounded; aperture circular; peristome continuous.

Type.—*P. texturata* Oliver.

Philorene texturata n. sp. Fig. 8.

Description of Type Specimen.—*Shell* subdiscoidal, the body-whorl slightly descending, umbilicate, whorls 3. Spire flat, body-whorl circular in section, its upper portion level with the periphery of the penultimate whorl. Aperture circular, peristome continuous, slightly expanded above and below on the inner side. Umbilicus deep. Suture deep. *Sculpture:* Protoconch smooth. Regular transverse ridges on the base of the whorls round the umbilicus. Interior of umbilicus with spiral ridges terminating at the lower expansion of the inner lip. Over the whole surface of the shell are close regular low spiral threads ornamented with transverse lenticular beads. *Colour* white.

Maximum diameter, 2 mm.; minimum diameter, 1·5 mm.

Habitat.—Dead shells common in dredgings near Sunday Island.

Brookula stibarochila Iredale.

Brookula stibarochila Iredale, Pro. Mal. Soc., x, 220, 1912.
Recorded, Iredale, *l.c.*

Specimens vary considerably in the number of ribs; the type has them wide apart.

Habitat.—A few dead shells dredged near Sunday Island.

Turbo argyrostomus Linné.

Turbo argyrostomus Linné, Syst. Nat., ed. x, 764, 1758.
Recorded (fossil), Oliver, Trans. N.Z. Inst., 43, 527, 1911.

Fossil.—Plentiful in hard sandy tuffs of submarine origin on Dayrell Islet, off Sunday Island.

Distribution (Recent).—Australia, Pacific Ocean from New Caledonia to Hawaii and the Paumotus, Indian Ocean.

Leptothyra picta (Pease).

Collonia picta Pease, Amer. Journ. Conch., iv, 91, 1868.
Recorded, Iredale, Pro. Mal. Soc., ix, 71, 1910.

Habitat.—Dead shells abundant in dredgings on gravelly bottom near Sunday Island, in 10 m. to 30 m.

Distribution.—Society Islands, Paumotus.

Nerita melanotragus E. A. Smith.

Nerita melanotragus E. A. Smith, Zool. Col. H.M.S. " Alert " (1, viii), 69, 1884.
Recorded, E. A. Smith, *l.c.*

Habitat.—Abundant living on rocks between tide-marks, most frequent at half-tide mark or higher, Sunday Island, Macauley Island.
Fossil.—In fragments of volcanic tuffs at Titi Knob, on east coast of Sunday Island.
Distribution.—Lord Howe Island, Norfolk Island, New Zealand, Tasmania, Australia, Henderson Island (East Pacific .

Nerita plicata Linné.

Nerita plicata Linné, Syst. Nat., ed. x, 779, 1758.
Recorded, Iredale, Pro. Mal. Soc., ix, 71, 1910.

Habitat.—Living on rocks about half-tide mark, Sunday Island and Meyer Island ; very rare.
Distribution.—Lord Howe Island, Norfolk Island, Australia, Pacific Ocean from New Caledonia to Hawaii, Indian Ocean.

Pronesopupa senex Iredale.

Pronesopupa senex Iredale, Pro. Mal. Soc., x, 385, 1913.
Recorded, Iredale, *l.c.*

Habitat.—Living on tree-trunks not moss-covered on the low ground, chiefly on *Corynocarpus* and *Melicytus* trees, Sunday Island.

Melarhaphe unifasciata (Gray).

Litorina unifasciata Gray, King's " Survey of Australia," ii, App., 483, 1826.

Recorded, Iredale, Pro. Mal. Soc., ix, 71, 1910 (*Littorina mauritiana*).
Habitat.—Living on rocks near high-water mark, north coast, Sunday Island ; rare.
Distribution.—Lord Howe Island, New Zealand, Tasmania, Australia

Tectarius feejeensis (Reeve).

Littorina feejeensis Reeve, Conch. Icon., fig. 82, 1857.
Recorded, Iredale, Pro. Mal. Soc., ix, 71, 1910.

Habitat.—Living on rocks near high-water mark, north coast, Sunday Island.
Distribution.—Indian and Pacific Oceans.

Hinea brasilianus (Lamarck).

Buccinum brasilianus Lam., Anim. s. Vert., vii, 272, 1822.
Recorded, Iredale, Pro. Mal. Soc., ix, 71, 1910 (*Planaxis*).

Habitat.—Abundant living on rocks between tide-marks, Sunday Island.
Distribution.—Lord Howe Island, Norfolk Island, New Zealand, Australia, Easter Island.

Haurakia kermadecensis n. sp. Fig. 9.

Description of Type Specimen.—Shell ovate, apex blunt, aperture broadly ovate. Whorls 5, rounded, suture impressed. Inner lip slightly detached,

giving a small umbilical depression. *Sculpture:* Protoconch of 1½ whorls spirally ribbed, there being 4 spirals on the lower whorl. First adult whorl with pronounced longitudinal plications, crossed by 3 spirals, 2 near the upper and 1 near the lower suture, and slightly beaded at the intersections. In the succeeding whorls the three spirals are more pronounced and the central space is faintly spirally ribbed, the axial plications remaining fairly prominent. In the body-whorl the longitudinals become obsolete at the periphery, while there are about 12 spiral ribs, the upper one most prominent, the 4th and 5th least so. *Colour:* White with spiral brown lines; the protoconch ribs are brown, also the two upper and one lower spiral ribs on the succeeding whorls, and 1st to 3rd and 6th to 10th spirals on the body-whorl, leaving the peripheral two white.

Height, 1·8 mm. Diameter, 1 mm.

Habitat.—Dead shells dredged abundantly in 10 m. to 30 m. on gravelly bottom off Sunday Island.

Notosetia electra n. sp. Fig. 10.

Description of Type Specimen. — *Shell* minute, ovate, apex obtuse. Whorls 3½, flattened, suture distinct. Aperture circular, peristome thin, not continuous. A small umbilical depression between the inner lip and the body-whorl. *Sculpture:* Protoconch smooth. Shell with microscopic spiral striae indicated. *Colour* pink.

Height, 0·7 mm. Diameter, 0·4 mm.

Habitat.—A few dead shells dredged on gravelly bottom near Sunday Island.

Merelina pisinna (Melvill and Standen).

Alvania pisinna Melv. & Stand., Journ. Conch., viii, 305, 1896.

Habitat.—Dead shells dredged abundantly in 10 m. to 30 m. on gravelly bottom near Sunday Island.

Distribution.—Loyalty Islands.

Onoba carnosa (Webster).

Rissoia carnosa Webster, Trans. N.Z. Inst., 37, 278, 1905.
Recorded, Iredale, Pro. Mal. Soc., ix, 71, 1910 (*Rissoa*).

This species occurs in four fairly well-defined colour-varieties, which may be characterized as under:—

1. Var. *typica.*—Spirally marked brown and white; the lower half of each whorl brown, the upper half white.
2. Var. *fusca.*—The whole shell brown.
3. Var. *alba.*—The whole shell white.
4. Var. *bicolor.*—Spire brown, body-whorl white.

Habitat.—Dead shells abundant in dredgings on gravelly bottom in 10 m. to 30 m. near Sunday Island.

Distribution.—New Zealand (varieties *typica, fusca,* and *bicolor*).

Onoba candidissima Webster.

Rissoia candidissima Webster, Trans. N.Z. Inst., 37, 278, 1905.
Recorded, Iredale, Pro. Mal. Soc., ix, 71, 1910 (*Rissoa*).

Habitat.—Dead shells dredged on gravelly bottom in 10 m. to 30 m. near Sunday Island.

Distribution.—New Zealand.

Rissoina angasi Pease.

Rissoina angasi Pease, Amer. Journ. Conch., vii, 20, 1872.

Habitat.—Living under stones near low-water mark, Coral Bay, Sunday Island.

Distribution.—New South Wales.

Rissoina plicata A. Adams.

Rissoina plicata A. Adams, Pro. Zool. Soc., 1851, 264, 1852.
Recorded, Iredale, Pro. Mal. Soc., ix, 71, 1910.

Habitat.—Dead shells dredged on gravelly bottom near Sunday Island.
Distribution.—New Guinea, Fiji, Ellice Group, Hawaii.

Zebina cooperi n. sp. Fig. 11.

Description of Type Specimen.—*Shell* elongate-ovate, the right side straight, the left slightly convex. Aperture ovate, slightly produced laterally. Whorls 7, flattened, the suture scarcely marked. Outer lip very thick, with 3 blunt tubercles inside the anterior end. A distinct canal between the posterior end and the body-whorl. *Sculpture:* Protoconch smooth. First adult whorl with about 12 longitudinal plications. The distance between them increases while their height decreases, until they become quite obsolete on the 4th whorl. On the parietal wall, near the posterior canal, are 3 minute longitudinal plications. Otherwise the shell is perfectly smooth and glassy, with microscopic axial striations. *Colour:* Glassy white, the interior structure indicated by darker spiral bands.

Height, 5 mm. Diameter, 2·4 mm.

Habitat.—Dead shells abundant in dredgings on gravelly bottom in 10 m. to 30 m. near Sunday Island.

Isselia chiltoni n. sp. Fig. 12.

Description of Type Specimen.—*Shell* elongate-ovate, the aperture slightly extended laterally. Whorls 5½, slightly flattened, suture deep. Aperture ovate, notched in front. Columella obliquely truncated anteriorly. Inner lip thickened, forming a callosity at the anterior angle of the columella. *Sculpture:* Protoconch of 1 whorl, smooth. First adult whorl with about 10 longitudinal plications. On the following whorl the longitudinal plications are crossed by 3 spiral ribs, the lowest only being prominent, beaded at the intersections. On the penultimate whorl a 4th spiral is added. On the body-whorl above are 9 spiral ribs, forming nodules at the intersections of longitudinal plications; the 2nd and 3rd spirals approximate, as do the 4th and 5th. On the under-surface these appear as 6 ribs, the upper being double. The interstices between the four anterior spirals about twice the width of the ribs. *Colour* white.

Height, 2·8 mm. Diameter, 1·4 mm.

Habitat.—Dead shells abundant in dredgings in 10 m. to 30 m. off Sunday Island.

Epigrus insularis n. sp. Fig. 13.

Description of Type Specimen.—*Shell* elongate, apex blunt, aperture produced, the body-whorl more than half the length of the shell. Whorls 4½, loosely coiled, rounded, shouldered above, suture deeply impressed. Aperture oval, peristome continuous, thickened throughout, a distinct

groove separating the inner lip from the body-whorl. *Sculpture:* Protoconch smooth, shining. Shell smooth, faintly microscopically marked spirally, also transversely, with growth-lines. *Colour* white.

Height, 2·8 mm. Diameter, 1 mm.

Habitat.—Dead shells dredged on gravelly bottom in 10 m. to 30 m. near Sunday Island.

Epigrus gracilis n. sp. Fig. 14.

Description of Type Specimen.—*Shell* elongate, slender, the whorls increasing but little in size. Whorls 4½, flattened, loosely coiled, margined above, suture deeply impressed. Aperture oval, peristone continuous, thin, inner lip separated from body-whorl by a distinct groove. *Sculpture:* Protoconch smooth. Shell with spiral threads and lines. On 1st adult whorl about 5 narrow low threads, which broaden and increase on succeeding whorls, there being on the body-whorl about 6 principal and as many smaller spiral threads, the interstices having under a high power a rough pitted appearance. *Colour* white.

Height, 1·7 mm. Diameter, 0·5 mm.

Habitat.—Dead shells dredged on gravelly bottom in 10 m. to 30 m. off Sunday Island.

Cerostraca n. gen.

Shell ovate, thin, whorls rounded, suture impressed. Aperture detached, circular, body-whorl anteriorly having a callosity just above the produced and expanded outer lip.

Type.—*C. iredalei* Oliver.

Cerostraca iredalei n. sp. Fig. 15.

Description of Type Specimen.—*Shell* ovate, apex blunt, the body-whorl bearing in front a prominent transverse callosity. Aperture completely detached from body-whorl, circular, the margin thin and expanded. *Sculpture:* Shell quite smooth. *Colour:* Protoconch white. Adult whorls glassy pink, a dark-pink spiral line below the suture, and another on the base of the whorl-shell. Anterior callosity dark pink. Peristome white.

Height, 1·3 mm. Diameter, 0·7 mm.

Habitat.—Dead shells dredged on gravelly bottom in 10 m. to 30 m. off Sunday Island.

Amphithalamus sundayensis n. sp. Fig. 16.

Description of Type Specimen.—*Shell* minute, ovate, apex blunt. Whorls 4, flattened, suture impressed. Aperture detached, broadly elliptical, slightly angled behind. Peristome thickened, a ridge connecting its posterior end with the body-whorl. Umbilical furrow wide. *Sculpture:* The whole shell quite smooth. *Colour:* Light olive-brown, the suture, peristome, and lower part of body-whorl darker.

Height, 1·2 mm. Diameter, 0·6 mm.

Habitat.—Dead shells dredged on gravelly bottom in 10 m. to 30 m. near Sunday Island.

Heterorissoa secunda Iredale.

Heterorissoa secunda Iredale, Pro. Mal. Soc., x, 222, 1912.

Recorded, Iredale, *l.c.*

Habitat.—Dead shells common in dredgings in 10 m. to 30 m. off Sunday Island.

Assiminea nitida (Pease).

Hydrocena nitida Pease, Pro. Zool. Soc., 1864, 674, 1865.
Recorded, Iredale, Pro. Mal. Soc., x, 370, 1913 (*Barleeia chrysomela*).

Habitat.—Living on rocks wetted by fresh water near the coast, Sunday Island and Dayrell Islet. (Dead shells occasionally dredged off the shore.)
Distribution.—Lord Howe Island, Norfolk Island, New Caledonia, Polynesia.

Royella sinon (Bayle).

Cerithium sinon Bayle, Journ. de Conch., xxviii, 243, 1880.
Recorded, Iredale, Pro. Mal. Soc., ix, 71, 1910 (*Cerithiopsis*).

Habitat.—Dead shells found on the beaches, Sunday Island.
Distribution.—Norfolk Island, Lifu, Bohol, Henderson Island (East Pacific)

Cerithium bavayi Vignal.

Cerithium bavayi Vignal, Journ. Conch., xlix, 304, 1901.

Habitat.—A few dead shells washed up on the beaches, Sunday Island.
Distribution.—Loyalty Islands.

Joculator pinea (Hedley).

Cerithiopsis pinea Hedley, Pro. Linn. Soc. N.S.W., 34, 440, 1909.

Habitat.—A few dead shells dredged off Sunday Island on gravelly bottom in 10 m. to 30 m.
Distribution.—Queensland.

Joculator aelomitres (Melvill and Standen).

Bittium aelomitres Melvill and Standen, Journ. Conch., viii, 298, 1896.

Habitat.—Dead shells dredged in 10 m. to 30 m. off Sunday Island.
Distribution.—Lifu.

Sundaya n. gen.

Shell pupoid, apex obtuse, sides convex. Protoconch minute, of 1 whorl. Body-whorl contracting anteriorly, canal nearly straight, sculptured with nodulous spiral ribs.
Type.—*S. exquisita* Oliver.

Sundaya exquisita n. sp. Fig. 17.

Description of Type Specimen.—*Shell* pupoid, apex obtuse, body-whorl more than half the length of the shell. Whorls 4, flattened, suture impressed. Aperture rhomboid, angled behind, notched in front. Canal short. Outer lip thin, slightly expanded. *Sculpture:* Protoconch smooth. First adult whorl with 2, remainder with 3, spiral nodulous ribs. The nodules arranged regularly in longitudinal as well as spiral rows, about 15 longitudinal rows on the body-whorl. Base with 3 spiral ridges not nodulous. *Colour:* Reddish-brown, the protoconch and lip lighter.
Height, 1 mm. Diameter, 0·5 mm.
Habitat.—A few dead shells dredged in 10 m. to 30 m. on gravelly bottom near Sunday Island.

Triphora granifera Brazier.

Triforis granifera Brazier, Pro. Linn. Soc. N.S.W., ix, 173, 1894.

Habitat.—Dead shells dredged on gravelly bottom in 10 m. to 30 m. off Sunday Island.

Distribution.—New South Wales.

Triphora jousseaumei Hervier.

Triforis jousseaumei Hervier, Journ. de Conch., 45, 250. 1898.

Habitat.—Dead shells dredged on gravelly bottom in 10 m. to 30 m. near Sunday Island.

Distribution —Lifu.

Triphora ampulla Hedley.

Triphora ampulla Hedley, Pro. Linn. Soc. N.S.W., 27, 615, 1903.

Habitat.—Dead shells dredged on gravelly bottom in 10 m. to 30 m. off Sunday Island.

Distribution.—New Zealand, New South Wales.

Sinistroseila n. gen.

Shell turreted, sinistral, sculptured with spiral ridges only.

Type.—*Triforis incisus* Pease.

Sinistroseila incisus (Pease).

Triforis incisus Pease, Pro. Zool. Soc., 1860, 434, 1861.

Habitat.—A few dead shells dredged in 10 m. to 30 m. on gravelly bottom off Sunday Island.

Distribution.—Hawaii, Funafuti, New Guinea.

Caecum solitarium n. sp. Fig. 18.

Description of Type Specimen.—*Shell* curved, of nearly uniform diameter throughout, anteriorly obliquely truncate. Septum much exserted, hemispherical, making an abrupt shoulder at the junction of the shell. *Sculpture:* Shell smooth, but showing under the microscope regular concentric growth-lines. *Colour* white.

Length, 2·7 mm. Diameter at anterior end, 0·4 mm.; at posterior end, 0·3 mm.

Habitat.—A few dead shells dredged near Sunday Island.

Alata aratrum Martyn.

Alata aratrum Martyn, Univ. Conch., i, 50, 1784.
Recorded, Iredale, Pro. Mal Soc., ix, 71, 1910 (*Strombus*).

Habitat.—Dead shells found on the beaches, Sunday Island.

Distribution.—Indo-Pacific region.

Strombus urceus Linné.

Strombus urceus Linné, Syst. Nat, ed. x, 745, 1758.
Recorded, Iredale, Pro. Mal. Soc., ix, 71, 1910.

Habitat.—Dead shells found on the beaches, Sunday Island.

Distribution.—Lord Howe Island, Norfolk Island, Australia, Philippines, Indian Ocean.

Strombus elegans Sowerby.

Strombus elegans Sowb., Thes. Conch., t. 7, figs. 43, 48.
Recorded, Iredale, Pro. Mal. Soc., ix, 71, 1910.

Habitat.—One dead shell dredged (Iredale).
Distribution.—Australia, Indo-Pacific.

Xenophora corrugata (Reeve).

Phorus corrugata Reeve, Pro. Zool. Soc., 1842, 163, 1843.
Recorded, Iredale, Pro. Mal. Soc., ix, 71, 1910.

Habitat.—Dredged alive in 30 m. near Meyer Island (W. S. Bell).
Distribution.—New Zealand, Indian Ocean, Japan.

Roya nutatus (Hedley).

Capulus nutatus Hedley, Pro. Linn. Soc. N.S.W., 33, 467, 1908.
Recorded, Iredale, Pro. Mal. Soc., x, 218, 1912 (*R. kermadecensis*).

Habitat.—Taken alive at Sunday Island by R. S. Bell.
Distribution.—New South Wales.

Hipponix foliacea Quoy and Gaimard.

Hipponix foliacea Q. & G., Voy. " Astrolabe," Zool., iii, 439, 1834.
Recorded, Iredale, Pro. Mal. Soc., ix, 71, 1910.

Habitat.—Living on stones in rock-pools at Meyer Island ; fairly common.
Fossil.—In hard sandy volcanic tuffs of submarine origin at Dayrell Islet. (*Amalthea* sp. Oliver, Trans. N.Z. Inst., 43, 527.)
Distribution.—Indo-Pacific region.

Natica sagittata Menke.

Natica sagittata Menke, Moll. Nov. Holl., 10, 1843.
Recorded, Iredale, Pro. Mal. Soc., ix, 71, 1910.

Habitat.—A few dead shells washed up on the beaches, Sunday Island.
Distribution.—Lord Howe Island, Norfolk Island, Australia.

Natica orientalis Gmelin.

Natica orientalis Gmelin, Syst. Nat., ed. xiii, 3673, 1791.
Recorded, Iredale, Pro. Mal. Soc., ix, 71, 1910.

Habitat.—Dead shells rarely washed up on beaches, Sunday Island.
Distribution.—Lord Howe Island, Malay Archipelago.

Polinices simiae (Deshayes).

Natica simiae Deshayes, Anim. s. Vert., viii, 522.
Recorded, Iredale, Pro. Mal. Soc., ix, 71, 1910.

Habitat.—Dead shells frequently washed up on the beaches, Sunday Island.
Distribution.—Lord Howe Island, Norfolk Island, Philippines, Pacific Ocean.

Lamellaria ophione Gray.

Lamellaria ophione Gray, Pro. Zool. Soc., 1849, 169, 1850.
Recorded, Suter, Subantarctic Is. N.Z., i, 22, 1909.

Habitat.—Dead shells rarely found washed up on the beaches, Sunday Island.
Distribution.—New Zealand, Tasmania, Australia.

Vanikoro wallacei Iredale.

Vanikoro wallacei Iredale, Pro. Mal. Soc., x, 226, 1912.
Recorded, Iredale, *l.c.*

Habitat.—Living under stones in rock-pools, Meyer Island.

Ianthina violacea (Bolten).

Ianthina violacea Bolten, Mus. Bolt., 75, 1798.
Recorded, Iredale, Pro. Mal. Soc., ix, 71, 1910 (*I. ianthina*).

Specimens from the Kermadecs can be sorted out into two varieties, a larger conoidal form and a smaller depressed form, between which it seems impossible to draw a satisfactory line. Possibly the small depressed shells are young, and afterwards the descent of the body-whorl gives them a more conoidal appearance. But, of course, it must be admitted that if only four species are recognized in the genus, then *I. violacea* must be counted as very variable. I include *J. communis* Lam. and *J. balteata* Reeve of Suter's Manual under this species.

Habitat.—Live specimens cast up on the beaches at Sunday Island in large numbers, many having attached their rafts of eggs. Also found at Macauley Island.

Distribution.—All tropical seas, and extending well into the temperate zones. New Zealand, Lord Howe Island.

Ianthina globosa Swainson.

Ianthina globosa Swains., Zool. Illustr., ii, pl. 85, 1822.
Recorded, Iredale, Pro. Mal. Soc., ix, 71, 1910.

Habitat.—Live specimens at certain times washed up in numbers on the beaches at Sunday Island.

Distribution.—Tropical and warm temperate seas. New Zealand.

Ianthina exigua Lamarck.

Ianthina exigua Lam., Anim. s. Vert., vi, 206, 1822.
Recorded, Iredale, Pro. Mal. Soc., ix, 71, 1910.

Habitat.—Live specimens frequently cast up on the beaches at Sunday Island.

Distribution.—Tropical and warm temperate seas. New Zealand, Lord Howe Island.

Ianthina umbilicata d'Orbigny.

Ianthina umbilicata d'Orbigny, Voy. Amér. Mérid., 414, 1847.
Recorded, Iredale, Pro. Mal. Soc., ix, 71, 1910.

Habitat.—Living adult specimens rarely, young at certain times frequently, washed up on the beaches at Sunday Island.

Distribution.—Lord Howe Island, Hawaii, North Pacific, Atlantic.

Recluzia lutea (Bennett).

Janthina lutea Bennett, Narr. Whaling Voy., ii, 298, 1840.
Recorded, Iredale, Pro. Mal. Soc., ix, 71, 1910 (*R. hargravesii*).

Habitat.—Live specimens occasionally washed up on the beaches at Sunday Island.

Distribution.—Australia.

Cypraea caputserpentis Linné.

Cypraea caputserpentis Linné, Syst. Nat., ed. x, 720, 1758.
Recorded, Cheeseman, Trans. N.Z. Inst., 20, 165, 1888.

Habitat.—Live specimens rarely found in rock-pools and among rocks near low-water mark, Sunday Island (R. S. Bell).

Distribution.—Lord Howe Island, Norfolk Island, Australia, Pacific islands from New Caledonia to the Paumotus, Indian Ocean.

Cypraea carneola Linné.

Cypraea carneola Linné, Syst. Nat., ed. x, 719, 1758.

Habitat.—Dead shells found on the beaches, Sunday Island.

Distribution.—Australia, Pacific islands from New Caledonia to Hawaii, Indian Ocean.

Cypraea isabella Linné.

Cypraea isabella Linné, Syst. Nat., ed. x, 722, 1758.

Habitat.—Dead shells found on the beaches, Sunday Island.

Distribution.—Australia, New Guinea, Pacific islands from New Caledonia to Hawaii, Indian Ocean.

Cypraea erosa Linné.

Cypraea erosa Linné, Syst. Nat., ed. x, 723, 1758.
Recorded, Iredale, Pro. Mal. Soc., ix, 71, 1910.

Habitat.—Dead shells occasionally washed up on the beaches at Sunday Island.

Distribution.—Indo-Pacific region.

Cypraea poraria Linné.

Cypraea poraria Linné, Syst. Nat., ed. x, 724, 1758.

Habitat.—One living specimen found among rocks in Denham Bay, Sunday Island (R. S. Bell).

Distribution.—Lord Howe Island, Australia, Pacific islands from New Caledonia to Hawaii.

Cypraea flaveola Linné.

Cypraea flaveola Linné, Syst. Nat., ed. x, 724, 1758.

Habitat.—Dead shells occasionally washed up on the beaches, Sunday Island.

Distribution.—Australia, Japan.

Trivia desirabilis Iredale.

Trivia desirabilis Iredale, Pro. Mal. Soc., x, 226, 1912.
Recorded, Iredale, *l.c.*

Habitat.—Dead shells occasionally washed up on the beaches, Sunday Island.

Trivia napolina (Keiner).

Cypraea napolina Kiener. Coq. Viv. 144.
Recorded, Iredale, Pro. Mal. Soc., ix, 71, 1910.

Habitat.—One dead shell found on beach, Sunday Island (Iredale).

Distribution.—Indo-Pacific region.

Erato lachryma Gray.

Erato lachryma Gray, Descr. Cat., 17, 1832.
Recorded, Iredale, Pro. Mal. Soc., ix, 71, 1910.

Habitat.—Dead shells frequently dredged on gravelly bottom in 10 m. to 30 m. off Sunday Island.

Distribution.—Australia, Tasmania, Japan.

Charonia lampas (Linné).

Murex lampas Linné, Syst. Nat., ed. x, 748, 1758.
Recorded, Iredale, Pro. Mal. Soc., ix, 71, 1910 (*Septa rubicunda*).

Kermadec specimens vary a good deal in the shape of the shell and the size of the nodules. They appear to have the characters of both *C. rubicunda* and *C. nodifera* as defined by Hedley (" Endeavour " Results, 65, 1914).

Habitat.—Sunday Island. Live specimens up to 12 cm. in length on rocks about low-water mark. Dead shells washed up on the rocks attained a length of over 23 cm.

Distribution.—New Zealand, Tasmania, south-east Australia, Mediterranean, Atlantic, Japan.

Cymatium exaratum (Reeve).

Triton exaratus Reeve, Pro. Zool. Soc., 1844, 116, 1845.
Recorded, Iredale, Pro. Mal. Soc., ix, 71, 1910.

Habitat.—A few live and many dead specimens washed up on the beaches, Sunday Island.

Distribution.—New Zealand, Australia.

Cymatium spengleri (Chemnitz).

Murex spengleri Chemn., Conch. Cab., xi, 117, 1795.
Recorded, Cheeseman, Trans. N.Z. Inst., 20, 165, 1888 (*Triton*).

Habitat.—One live and many dead shells found on the beaches at Sunday Island.

Distribution.—New Zealand, Tasmania, Australia.

Cymatium dunkeri (Lischke).

Triton dunkeri Lischke, Mal. Blatt., xv, 219, 1868.
Recorded, Iredale, Pro. Mal. Soc., ix, 71, 1910.

Habitat.—A few imperfect dead shells found on the beaches at Sunday Island.

Distribution.—Japan.

Cymatium caudatum (Gmelin).

Triton caudatum Gmelin, Syst. Nat., ed. xiii, 3535, 1791.
Recorded, Iredale, Pro. Mal. Soc., ix, 71, 1910.

Habitat.—Dead shells found on the beaches, Sunday Island.

Distribution.—Australia.

Cymatium parthenopeum von Salis.

Murex parthenopeus von Salis, Reise Neapel, 370, 1793.
Recorded, Iredale, Pro. Mal. Soc., ix, 71, 1910 (*C. costatum*).

Habitat.—Dead shells occasionally washed up on the beaches at Sunday Island.

Distribution.—New Zealand, Australia, Society Islands, Japan, Atlantic coasts.

Cymatium labiosum (Wood).

Murex labiosum Wood, Index Test. Suppl., 15, 1828.
Recorded, Iredale, Pro. Mal. Soc., ix, 71, 1910.

Habitat.—Dead shells frequent on the beaches of Sunday Island.
Distribution.—Australia, Philippines, Indian Ocean.

Cymatium vespaceum Lamarck.

Triton vespaceum Lam., Anim. s. Vert., vii, 185, 1822.
Recorded, Iredale, Pro. Mal. Soc., ix, 71, 1910.

Habitat.—Dead shells found on the beaches, Sunday Island.
Distribution.—Australia, Indian Ocean.

Cymatium waterhousei (Adams and Angas).

Triton waterhousei Ad. & Ang., Pro. Zool. Soc., 1864, 35, 1865.

Habitat.—Dead shells occasionally washed up on the beaches at Sunday Island.
Distribution.—South Australia.

Austrotriton parkinsoniana (Perry).

Septa parkinsoniana Perry, Conch., pl. 14, fig. 1, 1811.
Recorded, Iredale, Pro. Mal. Soc., ix, 71, 1910 (*Cymatium*).

Habitat.—A few broken dead shells found on the beaches at Sunday Island.
Distribution.—New Zealand, Australia.

Argobuccinum australasia (Perry).

Biplex australasia Perry, Conch., pl. 4, fig. 24, 1811.
Recorded, Cheeseman, Trans. N.Z. Inst., 20, 165, 1888 (*Ranella leucostoma*).

Habitat.—Common living on rocks at low-water mark, Meyer Island. Shells almost always much corroded.
Distribution.—Lord Howe Island, New Zealand.

Bursa siphonata (Reeve).

Ranella siphonata Reeve, Pro. Zool. Soc., 1844, 138, 1845.
Recorded, Suter, Trans. N.Z. Inst., 38, 328, 1906 (*Tutufa californica*).

Habitat.—Dead shells, rarely washed up on the beaches, Sunday Island. Cheeseman collected a shell on Denham Bay beach in 1887. I am aware of only three others collected since.
Distribution.—Philippines.

Bursa mammata Bolten.

Bursa mammata Bolten, Mus. Bolt. (2), 128, 1798.

Habitat.—Dead shells rarely washed up on the beaches at Sunday Island.
Distribution.—New Caledonia.

Bursa papilla (Wood).

Murex papilla Wood, Index Test. Suppl., 14, 1828.
Recorded, Iredale, Pro. Mal. Soc., ix, 71, 1910 (*Argobuccinum*).

Habitat.—Dead shells frequently washed up on the beaches at Sunday Island. A few live specimens also found.
Distribution.—Lord Howe Island.

Cassidea royana Iredale.

Cassidea royana Iredale, Pro. Mal. Soc., xi, 179, 1914.
Recorded, Cheeseman, Trans. N.Z. Inst., 20, 165, 1888 (*Cassis pyrum*).

Habitat.—One dead shell was found on Denham Bay beach, Sunday Island, by Mr. T. F. Cheeseman in 1887, and is now in the Auckland Museum. A second and imperfect specimen (the type) was brought back by Mr. Iredale, and is now in the Canterbury Museum.

Cassidea perryi Iredale.

Cassidea perryi Iredale, Pro. Mal. Soc., x, 227, 1912.
Recorded, Iredale, Pro. Mal. Soc., ix, 71, 1910 (*C. cernica*).

The type specimen is 41 mm. long, and has a varix exactly similar to the outer lip, and 100° from it. I have not seen a varix on any other specimen.

Habitat.—Dead shells occasionally washed up on the beaches at Sunday Island. One live specimen was obtained in 1908.

Cassidea pyrum (Lamarck).

Cassis pyrum Lamarck, Anim. s. Vert., vii, 226, 1822.
Recorded, Iredale, Pro. Mal. Soc., ix, 71, 1910 (*Cassidea pyrum sophiae*).

Habitat.—One dead shell collected on beach (Iredale).
Distribution.—New Zealand, Tasmania, Australia.

Tonna perdix (Linné).

Buccinum perdix Linné, Syst. Nat., ed. x, 735, 1758.
Recorded, Iredale, Pro. Mal. Soc., ix, 71, 1910 (*Dolium*).

Habitat.—Dead shells rarely found on the beaches at Sunday Island; also one live specimen was found on Denham Bay beach in 1908.

Distribution.—Lord Howe Island, Australia, New Guinea, New Caledonia, Pacific, Atlantic, and Indian Oceans.

Cadium pomum (Linné).

Buccinum pomum Linné, Syst. Nat., ed. x, 735, 1758.
Recorded, Iredale, Pro. Mal. Soc., ix, 71, 1910 (*Dolium*).

Habitat.—Dead shells found on the beaches, Sunday Island.

Distribution.—Australia, New Guinea, Pacific islands from New Caledonia to the Society Islands, Philippines, Indian Ocean.

Architectonica radiata Bolten.

Architectonica radiata Bolten, Mus. Bolt., 1798.
Recorded, Iredale, Pro. Mal. Soc., ix, 71, 1910 (*A. cingula*).

Habitat.—Dead shells found on the beaches, Sunday Island.

Distribution.—Lord Howe Island, Norfolk Island, Fiji, Hawaii, Philippines.

Heliacus variegatus (Gmelin).

Torinia variegatus Gmelin, Syst. Nat., ed. xiii, 3575, 1791.
Recorded, Iredale, Pro. Mal. Soc., ix, 71, 1910.

Habitat.—Dead shells found on the beaches, Sunday Island.

Distribution.—New Zealand, Australia, Pacific and Indian Oceans.

Heliacus stramineus (Gmelin).

Torinia straminea Gmelin, Syst. Nat., ed. xiii, 3575, 1791.
Recorded, Iredale, Pro. Mal. Soc., ix, 71, 1910.

Habitat.—Dead shells found on the beaches, Sunday Island.
Distribution.—Australia, New Guinea, Philippines, India.

Epitonium perplexum (Pease).

Scalaria perplexa Pease, Amer. Journ. Conch., iii, 228, 1867.
Recorded, Suter, Journ. Malac., vii, 54, 1899 (*Scalaria australis*).

Habitat.—Dead shells frequently washed up on the beaches, Sunday Island.
Distribution.—Norfolk Island, Indo-Pacific region.

Pyramidella terebelloides (A. Adams).

Obeliscus terebelloides A. Adams in Sowb. Thes. Conch., ii, 808, 1855.

Habitat.—Dead shells rarely dredged on gravelly bottom near Sunday Island.
Distribution.—Queensland, Funafuti, Hawaii.

Herviera isidella (Melvill and Standen).

Herviera isidella Melv. & Stand., Journ. Conch., ix, 186, 1898.

Habitat.—Dredged near Sunday Island (Iredale).
Distribution.—Loyalty Islands.

Turbonilla oceanica n. sp. Fig. 19.

Description of Type Specimen. — *Shell* subulate. Whorls 8, rounded, shouldered above, suture deeply impressed. Protoconch heterostrophe, of 1 whorl. Aperture ovate-rhomboid, the inner margin somewhat angled, the outer rounded. Outer lip thickened, inner lip thin, anteriorly raised above and separated from the body-whorl. *Sculpture:* Protoconch smooth. Shell with regular longitudinal ribs, there being about 18 on the body-whorl, where they terminate below the periphery. Interstices equal or slightly wider than the width of the ribs. *Colour* white, shining.

Height, 3 mm. Diameter, 0·8 mm.

Variations from Type—Most of the specimens are about the same size as the type. One, however, has 9½ whorls, and measures 3·9 mm. in length.

Habitat.—Dead shells dredged on gravelly bottom in 10 m. to 30 m. off Sunday Island.

Turbonilla sculpturata n. sp. Fig. 20.

Description of Type Specimen.—*Shell* thin, subulate, but little tapered. Whorls 8½, loosely coiled, convex, suture deep. Protoconch heterostrophe, of 1 whorl. Aperture ovate-oblong, produced and rounded in front. Outer lip thin. Inner lip straight, produced and expanded anteriorly. *Sculpture:* Protoconch smooth. Shell with close, slightly oblique, narrow, longitudinal ribs, about 25 on the body-whorl. The interstices 2 or 3 times the width of the ribs. Ribs smooth, interstices with fine spiral striae. Base spirally striate. *Colour* white, translucent.

Height, 2·1 mm. Diameter, 0·5 mm.

Habitat.—Dead shells dredged on gravelly bottom in 10 m. to 30 m. off Sunday Island.

Odostomia clara Brazier.

Odostomia clara Brazier, Pro. Linn. Soc. N.S.W., i, 259, 1877.

Habitat.—Dead shells dredged on gravelly bottom near Sunday Island.
Distribution.—Queensland.

Odostomia metata Hedley.

Odostomia metata Hedley, Pro. Linn. Soc. N.S.W., 32, 503, 1907.

Habitat.—Dead shells dredged on gravelly bottom near Sunday Island.
Distribution.—Queensland.

Miralda austro-pacifica n. sp. Fig. 21.

Description of Type Specimen.—Shell ovate, apex blunt. Whorls 5½, flattened, suture deep. Aperture ovate, peristome not continuous. Outer lip thin. Inner lip thin, narrow. Columella with a small oblique plait, not reaching to the margin of the inner lip. *Sculpture:* Protoconch of 1 whorl, smooth. Adult whorls with 3 spiral ribs, increasing to 4 on the penultimate and with a fifth on the base. Upper two ribs nodulous, the remainder smooth. Nodules in the upper row smaller than in the lower row. There are faint microscopic axial growth-lines on the lower portions of the whorls. *Colour* white.

Height, 2·2 mm. Diameter, 0·9 mm.

This species appears to be closely related to *Odostomia scopulorum* Watson, from Hawaii.

Habitat.—Dead shells dredged in 10 m. to 30 m. on gravelly bottom off Sunday Island.

Hinemoa n. gen.

Shell ovate. Protoconch 1-whorled. Aperture ovate. Columella with a feeble plait. Sculpture of spiral ribs only.

Type.—Hinemoa punicea Oliver.

Hinemoa punicea n. sp. Fig. 22.

Description of Type Specimen.—Shell ovate, apex obtuse. Whorls 4½. Aperture broadly ovate. Outer lip thin. Inner lip anteriorly raised with a slight umbilical chink between it and the body-whorl. Columella-plait small, oblique. *Sculpture:* Protoconch of 1 whorl, smooth, polished. Shell with high rounded equidistant spiral ribs, 2 on each whorl, the distance between them equal to their width, and equal to the distance between those on each side of the suture, which is not distinguishable. Three additional low spiral ribs on the base. Otherwise the surface is quite smooth. *Colour:* Protoconch ruby-red, shining; shell light pink, whitish within the aperture.

Height, 1·1 mm. Diameter, 0·6 mm.

Habitat.—Dead shells dredged in 10 m. to 30 m. off Sunday Island; not common, but easily overlooked.

Pyrgulina insularis n. sp. Fig. 23.

Description of Type Specimen.—Shell ovate, apex obtuse. Whorls 5, flattened, angled at the suture, which is deep. Aperture rhomboid-ovate. Outer lip thin. Inner lip separated from the body-whorl below, leaving a deep umbilical chink. A feeble plait on the columella within. *Sculpture:* Protoconch smooth. Adult whorls with rounded longitudinal ribs, about 20 on the body-whorl. Interstices nearly twice the width of the ribs. On the body-whorl the ribs terminate at a spiral groove below the periphery,

above which there is another ill-defined spiral groove. Base with numerous growth-lines. *Colour* white.

Height, 2 mm. Diameter, 0·9 mm.

Habitat.—Dead shells dredged on gravelly bottom in 10 m. to 30 m. off Sunday Island.

Raoulostraca n. gen.

Shell elongate-ovate, obtuse. Body-whorl nearly half the length of the shell. Protoconch of 1 whorl, apex sinistral. Whorls flat, suture scarcely impressed. Aperture ovate. Inner lip thick, continuous to suture.

Type.—Raoulostraca inexpectata Oliver.

Raoulostraca inexpectata n. sp. Figs. 24 and 24*a*.

Description of Type Specimen.—Shell elongate-ovate, sides nearly straight. Apex sinistral, its convolution easily seen through the semi-transparent covering of the first adult whorl. Whorls 6, flat, suture but slightly marked. Aperture ovate. Outer lip thickened anteriorly. Inner lip thick, continued back to the suture with a distinct groove between it and the body-whorl. *Sculpture:* Shell quite smooth. *Colour* a rich brown, darkest on the upper part of the whorls.

Height, 4·4 mm. Diameter, 1·4 mm.

The type is an average-sized specimen. A single large specimen has 7 whorls, and measures—height, 6·3 mm.; diameter, 1·7 mm.

Habitat.—Dead shells abundant in dredgings on gravelly bottom in 10 m. to 30 m. off Sunday Island.

Melanella kermadecensis n. sp. Fig. 25.

Description of Type Specimen.—Shell subulate, apex blunt, right side nearly straight, left side slightly curved outwards. Whorls 6, flat, suture scarcely distinguishable. Aperture ovate, not much produced. Lip thick. Shell smooth, white, and shining.

Height, 2·8 mm. Diameter, 0·9 mm.

Habitat.—Dead shells common in dredgings on gravelly bottom in 10 m. to 30 m. off Sunday Island.

Melanella perplexa n. sp. Fig. 26.

Description of Type Specimen. — Shell subulate, tapered irregularly, apex acute. Right side nearly straight, but the apex tilted to one side; left side very slightly curved. Whorls 11, flat, suture scarcely marked. Aperture broadly ovate, the outer lip produced laterally beyond the line of the spire, and produced and expanded in front. Above the suture a spiral line is visible. Shell smooth, white, shining, translucent.

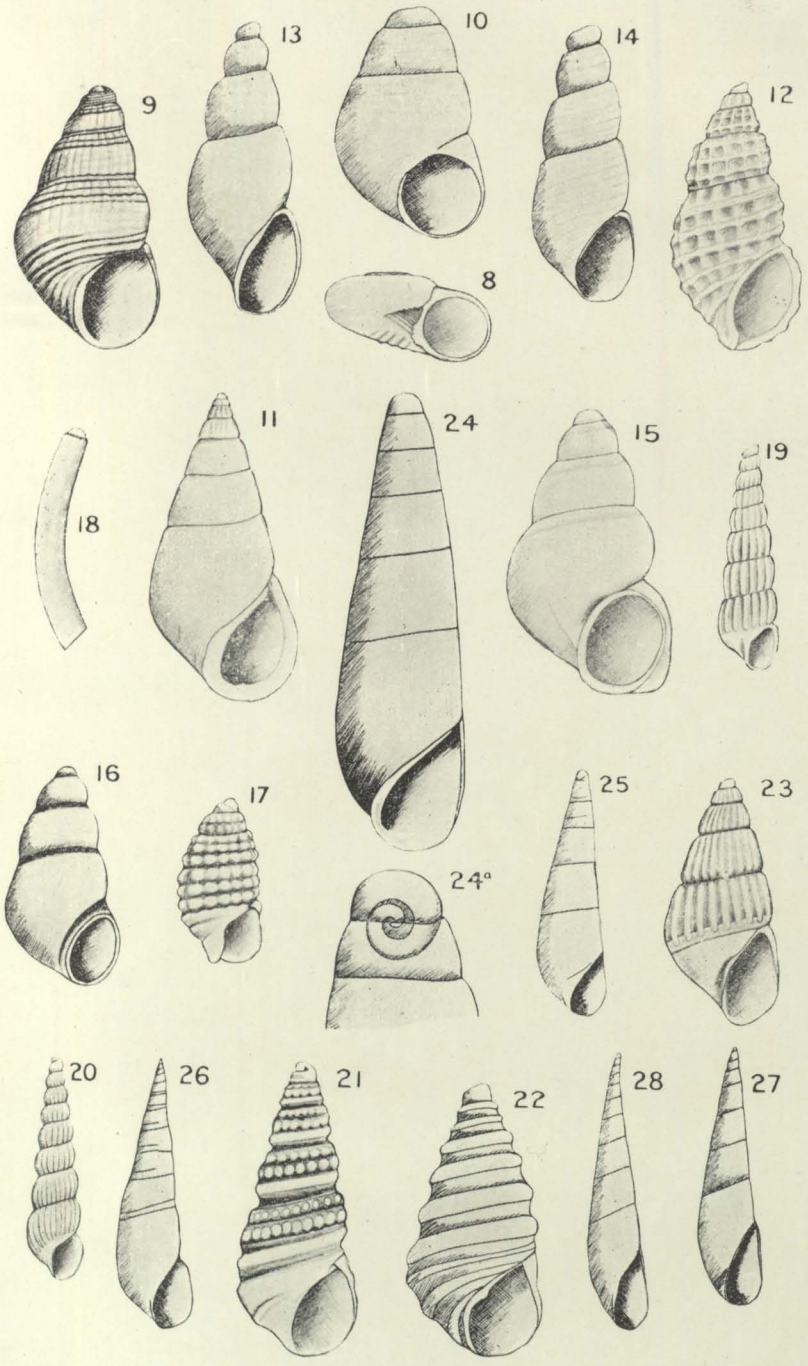
Height, 4·8 mm. Diameter above aperture, 1·4 mm.

A perplexing species, owing to the curious appearance of specimens of various ages of growth, caused by the tilted apex being at different angles to the aperture.

Habitat.—Dead shells abundant in dredgings on gravelly bottom in 10 m. to 30 m. off Sunday Island.

Melanella spinosa n. sp. Fig. 28.

Description of Type Specimen.—Shell narrow subulate, slightly curved to the right, the greatest curvature being near the apex. Whorls 10, flat,



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sutural line distinct, body-whorl about one-third the length of the shell. Aperture narrowly ovate. Inner lip thick, narrowing posteriorly, extending right back to the suture with a distinct groove between it and the body-whorl. *Sculpture:* Shell smooth, a spiral line above the sutural line. *Colour* white, transparent, the internal structure being clearly visible through the shell.

Height, 4·7 mm. Diameter, 1 mm.

Habitat.—A few dead shells dredged on gravelly bottom near Sunday Island.

Subularia perspicua n. sp. Fig. 27.

Description of Type Specimen.—Shell subulate, right side straight, left side nearly straight from apex to periphery of body-whorl, which then contracts towards the anterior end. Apex acute. Whorls 8, flat, suture scarcely distinct, body-whorl a little less than half the length of the shell. Aperture narrowly ovate. *Sculpture:* Shell smooth, a faint spiral line visible above the sutural line. *Colour:* Protoconch white. Spire yellowish-white, suture darker, the body-whorl white, faintly irregularly blotched with yellowish. A diagonal yellowish band across the columella anteriorly. Semi-transparent, the internal structure being visible through the shell.

Height, 3 mm. Diameter, 0·8 mm.

Habitat.—Dead shells dredged on gravelly bottom near Sunday Island.

Cithna wallacei n. sp. Fig. 29.

Description of Type Specimen.—Shell thin, glassy, ovate, apex blunt. Whorls 5, rounded, suture deeply impressed. Aperture broadly ovate, peristome thin. A narrow umbilical groove between the inner lip and the body-whorl. *Sculpture:* The whole shell quite smooth. *Colour:* Protoconch white. Adult whorls glassy, variegated with brown blotches. On the upper portion of the whorls these take the form of irregular brown diagonal bands, which at first slant forwards, then turn at right angles as narrow bands. The lower part of the spire-whorls with a few small brown patches. A clear peripheral band on the body-whorl, but narrow axial brown stripes round the base.

Height, 1·7 mm. Diameter, 1 mm.

Habitat.—Dead shells common in dredgings in 10 m. to 30 m. off Sunday Island.

Scalenostoma suteri n. sp. Fig. 30.

Description of Type Specimen. — Shell thin, turreted, sides straight, apex bluntly acuminate. Whorls 9, angular, sloping away on each side from the upper keel. Suture impressed. Aperture narrowly ovate, produced and truncated in front. Outer lip thick. Inner lip thick, a callosity at its anterior end, and a slight umbilical groove between it and the body-whorl, both lip and groove being continuous right back to the suture. *Sculpture:* Protoconch of 1 whorl, smooth. On the succeeding whorls are two high spiral keels, the upper of which is the higher. The ends of the spirals appear as two prominent projections on the outer lip. Entire surface of shell quite smooth. *Colour* white, translucent.

Height, 4·2 mm. Diameter, 1·2 mm.

Habitat.—Dead shells abundant in dredgings on gravelly bottom in 10 m. to 30 m. off Sunday Island.

Atlanta fusca Eydoux and Souleyet.

Atlanta fusca Eyd. & Soul., Voy. " Bonite," Zool., ii, 389, 1852.
Recorded, Iredale, Pro. Mal. Soc., ix, 71, 1910.

Habitat.—Dead shells frequently washed up on the beaches at Sunday Island.
Distribution.—All seas.

Fusinus toreuma (Martyn).

Buccinum toreuma Martyn, Univ. Conch., i, t. 56, 1784.
Recorded, Iredale, Pro. Mal. Soc., ix, 71, 1910 (*Colus*).

Habitat.—Dredged alive in 30 m. near Meyer Island (W. S. Bell).
Distribution.—Indo-Pacific region.

Mitra mitra (Linné).

Voluta mitra var. *episcopalis* Linné, Syst. Nat., ed. x, 732, 1758.
Recorded, Iredale, Pro. Mal. Soc., ix, 71, 1910.

Habitat.—Dead shells found on the beaches, Sunday Island.
Distribution.—Australia, Indo-Pacific region.

Mitra carbonaria Swainson.

Mitra carbonaria Swainson, Bligh Cat. Append., 10, 1822.
Recorded, Iredale, Pro. Mal. Soc., ix, 77, 1910.

Habitat.—Dead shells found on the beaches at Sunday Island.
Distribution.—New Zealand, New South Wales.

Mitra lanceolata Hervier.

Mitra lanceolata Hervier, Journ. de Conch., 45, 64, 1897.
Recorded, Iredale, Pro. Mal. Soc., ix, 71, 1910.

Habitat.—Dead shells found on the beaches at Sunday Island.
Distribution.—Lifu.

Maculotriton bracteatus (Hinds).

Triton bracteatus Hinds, Pro. Zool. Soc., 1844, 21, 1845.

Habitat.—One dead shell collected by R. S. Bell at Sunday Island.
Distribution.—Lord Howe Island, Australia, Loyalty Islands, Malacca Straits, Marquesas, New Ireland, Henderson Island (East Pacific).

Jeannea hedleyi Iredale.

Jeannea hedleyi Iredale, Pro. Mal. Soc., x, 220, 1912.
Recorded, Iredale, *l.c.*

Habitat.—Living among rocks near low-water mark, Sunday Island; fairly common in places.

Arcularia spiratus (A. Adams).

Nassa spirata A. Adams, Pro. Zool. Soc., 1851, 106, 1852.
Recorded, Iredale, Pro. Mal. Soc., ix, 71, 1910 (*Alectrion*).

Habitat.—Living in sand among rocks at Coral Bay, Sunday Island (R. S. Bell).
Distribution.—Lord Howe Island, Norfolk Island, New Zealand, Australia.

Arcularia gaudiosus (Hinds).

Nassa gaudiosa Hinds, Voy. " Sulphur," 36, 1844.
Recorded, Suter, Trans. N.Z. Inst., 38, 331, 1906 (*Nassa zonalis*).

Habitat.—Dead shells frequently washed up on the beaches at Sunday Island.

Fossil.—In coarse gravel cemented by calcite, Titi Knob, Sunday Island. (*Nassa* sp. Oliver, Trans. N.Z. Inst., 43, 530, 1911.)

Distribution.—Pacific Ocean, Malaya.

Arcularia scalaris (A. Adams).

Nassa scalaria A. Adams, Pro. Zool. Soc., 1851, 108, 1852.
Recorded, Iredale, Pro. Mal. Soc., ix, 71, 1910 (*Alectrion*).

Habitat.—A few dead and broken shells found on the beaches at Sunday Island.

Distribution.—Philippines.

Murex zelandicus Quoy and Gaimard.

Murex zelandicus Q. & G., Voy. " Astrolabe," ii, 529, 1833.
Recorded, Watson, " Challenger " Rep., xv, pt. 42, 157, 1886.

Habitat.—Dredged in 1,100 m. on hard ground north of Sunday Island (" Challenger " Expedition).

Distribution.—New Zealand, Tongatabu.

Hexaplex puniceus n. sp. Fig. 31.

Description of Type Specimen.—*Shell* rhomboidal, the spire about half the length of the shell. Aperture ovate-elliptical. Canal less than the length of the aperture, straight, slightly deflected to the left and its anterior end upturned. Whorls 4½, suture deep. Outer lip formed of the last axial ridge, broad, with 4 transverse ridges. A slight umbilical fissure between the inner lip, and a short false canal opposite the anterior end of the aperture. *Sculpture:* Protoconch of 1 whorl, smooth. Spire-whorls with 2 high spiral keels, crossed by prominent longitudinal ridges, forming nodules at the intersections. Body-whorl with 9 high axial ridges (the last forming the outer lip), and crossed by 4 spiral ridges, forming nodules at the intersections. The two upper spiral ridges on the shoulder are higher than the two lower. A fifth spiral ridge on the canal above. *Colour* pink.

Height, 4·6 mm. Diameter, 2·6 mm.

Habitat.—A few dead and broken shells dredged in 10 m. to 30 m. off Sunday Island.

Trophon subtropicalis Iredale.

Trophon subtropicalis Iredale, Pro. Mal. Soc., x, 227, 1912.
Recorded, Iredale, *l.c.*

Habitat.—Dead shells abundant in dredgings on gravelly bottom in 10 m. to 30 m. off Sunday Island.

Neothais succincta (Martyn).

Buccinum succinctum Martyn, Univ. Conch., ii, fig. 45, 1784.
Recorded, Iredale, Pro. Mal. Soc., ix, 71, 1910 (*Thais*).

Habitat.—Living specimens taken at Sunday Island by R. S. Bell.

Distribution.—Lord Howe Island, Norfolk Island, New Zealand, Tasmania, Australia.

Neothais chaidea (Duclos).

Drupa chaidea Duclos, Ann. Sci. Nat., 106, 1834.
Recorded, Iredale, Pro. Mal. Soc., ix, 71, 1910 (*Thais*).

Habitat.—Living under stones near low-water mark, Coral Bay, Sunday Island; not common.
Distribution.—Lord Howe Island, Norfolk Island, New Caledonia, Australia.

Neothais smithi (Brazier).

Purpura smithi Brazier, Mem. Aust. Mus., ii, pl. 4, 1889 (no description).
Recorded, Suter, Trans. N.Z. Inst., 38, 331, 1906 (*Purapura striata bollonsii*).

Habitat.—Common living on rocks between tide-marks at Sunday Island.
Distribution.—Lord Howe Island, Norfolk Island, New Zealand.

Neothais dealbata (Reeve).

Ricinula dealbata Reeve, Conch. Icon., iii, sp. 26, 1846.

Habitat.—Dead shells frequently washed up on the beaches, Sunday Island.
Distribution.—Philippines, South Pacific Ocean.

Columbella versicolor Sowerby.

Columbella versicolor Sowb., Pro. Zool. Soc., 1832, 119, 1833.
Recorded, Iredale, Pro. Mal. Soc., ix, 71, 1910.

Habitat.—Living under stones at low-water mark, Coral Bay, Sunday Island; not common.
Distribution.—Lord Howe Island, Australia, Philippines, Japan, Indian and Pacific Oceans.

Columbella varians Sowerby.

Columbella varians Sowb., Pro. Zool. Soc., 1832, 116, 1833.

Habitat.—Dead shells collected at Sunday Island by R. S. Bell.
Distribution.—Lord Howe Island, Australia, New Guinea, New Caledonia eastwards to Hawaii, Galapagos Islands, Philippines.

Coralliophila neritoidea (Lamarck).

Pyrula neritoidea Lam., Anim. s. Vert., vii, 146, 1822.
Recorded, Iredale, Pro. Mal. Soc., ix, 71, 1910.

Habitat.—Dead shells found on the beaches, Sunday Island.
Distribution.—Pacific Ocean.

Coralliophila nivea (A. Adams).

Rhizochilus nivea A. Adams, Mazat. Cat., 484.
Recorded, Iredale, Pro. Mal. Soc., ix, 71, 1910.

Habitat.—Taken alive at Sunday Island by W. S. Bell.
Fossil.—In hard sandy volcanic tuffs of submarine origin, Deyrell Islet. (*Purpura* sp. Oliver, Trans. N.Z. Inst., 43, 527.)
Distribution.—America.

Coralliophila lischkeana (Dunker).

Rapana lischkeana Dunker, Index Moll. Mar. Japan, 43, 1882.
Recorded, Iredale, Pro. Mal. Soc., ix, 71, 1910.

Habitat.—Dead shells rarely found on the beaches at Sunday Island.
Distribution.—Australia, Japan.

Quoyula madreporarium (Sowerby).

Purpura madreporarium Sowerby, Gen. *Purpura*, 1832.
Recorded, Iredale, Pro. Mal. Soc., ix, 71, 1910 (*Coralliophila monodonta*).

Habitat.—Abundant, living on coral attached to rocks in 1 m. to 4 m., Sunday Island and Meyer Island.
Distribution.—Australia, Pacific Islands.

Magilus antiquus Montfort.

Magilus antiquus Montfort, Conch. Syst. 43, 1810.
Recorded, Iredale, Pro. Mal. Soc., ix, 71, 1910.

Habitat.—Living in coral in 1 m. to 4 m., Meyer Island.
Distribution.—Solomon Islands, Indian and Pacific Oceans.

Lyria nucleus (Lamarck).

Voluta nucleus Lam., Ann. Mus., xvii, 73, 1811.
Recorded, Iredale, Pro. Mal. Soc., ix, 71, 1910.

Habitat.—Dead shells occasionally washed up on the beaches at Sunday Island.
Distribution.—Lord Howe Island, Norfolk Island, Australia.

Marginella mustelina (Angas).

Hyalina mustelina Angas, Pro. Zool. Soc., 1871, 14, 1872.
Recorded, Iredale, Pro. Mal. Soc., ix, 71, 1910.

Habitat.—Dead shells dredged on gravelly bottom in 10 m. to 30 m. off Sunday Island.
Distribution.—New Zealand, Australia.

Marginella angasi Brazier.

Marginella angasi Brazier, Journ. de Conch., 304, 1870.

Habitat.—Dead shells dredged on gravelly bottom, Sunday Island.
Distribution.—New South Wales.

Turris cingulifera (Lamarck).

Pleurotoma cingulifera Lam., Anim. s. Vert., vii, 94, 1822.
Recorded, Iredale, Pro. Mal. Soc., ix, 71, 1910.

Habitat.—A few dead shells found on the beaches, Sunday Island.
Distribution.—Indo-Pacific region.

Mangilia bella (Pease).

Daphnella bella Pease, Pro. Zool. Soc., 1860, 147, 1861.

Habitat.—Dead shells dredged in 10 m. to 30 m. on gravelly bottom near Sunday Island.
Distribution.—Hawaii.

Mangilia hedleyi n. sp. Fig. 32.

Description of Type Specimen.—Shell fusiform, the spire more than 1½ times the length of the aperture. Whorls 7½, prominently angled above the periphery, suture deep. Aperture narrow oblong, slightly oblique, angled behind, truncate in front. Outer lip rather thick with sharp edge, sinus deep and broad, separated from the body-whorl by a slight callus. Inner lip narrow and thin. Canal short, wide. *Sculpture:* Protoconch of 3 whorls, the upper quite smooth, the lower two with a spiral peripheral rib, otherwise smooth. Adult whorls with prominent axial ridges, about 15 on the body-whorl, terminating above the slightly contracted base. The whole shell crossed by close spiral ribs, of which one is prominent on all the whorls at the angle above the periphery, and on the penultimate and body-whorls two others are prominent below this. *Colour:* Protoconch white, shining, the extreme tip brown. Shell creamy white, with a broad dark-brown spiral band at the suture, and continued over the base of the body-whorl below the periphery. The extreme anterior end of the shell, the edge of the outer lip, and a small patch on the body-whorl near it are similarly coloured. The brown colour passes through the shell, and appears distinctly in the interior of the aperture

Height, 6 mm Diameter, 2·5 mm.

Habitat.—Dead shells dredged in 10 m. to 30 m. on gravelly bottom near Sunday Island.

Glyphostoma roseocincta n. sp. Fig. 33.

Description of Type Specimen.—Shell broadly fusiform the aperture slightly less than half the length of the shell. Whorls 5½, angled at the periphery, suture deep. Aperture narrow rhomboid-oblique. Outer lip thickened, denticulate within. Sinus deep, its posterior edge a small callous ridge on the body-whorl. Inner lip thin, narrow. Columella with folds very faintly indicated. Canal wide. *Sculpture:* Protoconch 1½ whorls, smooth. Shell with high axial ridges, 12 on the body-whorl, becoming obsolete on the base. The whole crossed by regular equidistant raised spiral threads, the interstices 2 or 3 times the width of the threads. *Colour* pink, a broad spiral dark brownish-pink band at the suture and extended round the base of the body-whorl.

Height, 4 mm. Diameter, 2 mm.

Variations from Type.—In most specimens no columellar folds can be distinguished.

Habitat.—Dead shells fairly common in dredgings in 10 m. to 30 m. on gravelly bottom near Sunday Island.

Iredalea n. gen.

Shell narrow fusiform, turreted, the aperture about a third the length of the shell. Canal short, wide. Sinus deep and broad, separated from the body-whorl by a callosity. Protoconch of 4 whorls, *sinusigera* in form.

Type.—Iredalea subtropicalis Oliver.

Iredalea subtropicalis n. sp. Fig. 34.

Description of Type Specimen.—Shell narrow, fusiform, truncated anteriorly, aperture one-third the length of the shell. Whorls 9, of which the protoconch forms 4, flatly rounded, suture impressed. Protoconch *sinusigera* in form, the exposed portion of its lower lip concave. Aperture

narrow oblong, obliquely angled behind, truncated in front. Outer lip thick, smooth within. Sinus deep, separated from the body-whorl by a thick callous ridge. Columella smooth within. Canal short, wide. *Sculpture:* Protoconch smooth. Shell with regular low axial ridges, about 15 on the body-whorl, slightly constricted at their upper ends near the suture. The ridges extend on to the base of the shell, which at its anterior end has 4 oblique low ridges. Entire surface of shell smooth and shining. *Colour:* Protoconch dark yellow. Shell white, with a faint brown band, dark in patches, along the lower edge of the whorls, but not reaching the outer lip, where, at its anterior end, 2 narrow brown bands are very faintly indicated.

Height, 6·2 mm. Diameter, 2·2 mm.

Habitat.—Dead shells in dredgings in 10 m. to 30 m. on gravelly bottom off Sunday Island; not common.

Kermia n. gen.

Shell fusiform, aperture narrow, nearly half the length of the shell. Canal short and wide. Sinus deep, near the suture, surrounded by a thick lip. Protoconch of 2 whorls. Outer lip thick, denticulate within. Columella smooth.

Type.—Kermia benhami Oliver.

Kermia benhami n. sp. Fig. 35.

Description of Type Specimen.—Shell fusiform, the body-whorl more than half the length of the shell. Whorls 6½, flatly rounded, suture deep. Aperture narrow, slightly oblique, sinuous. Outer lip thick, slightly expanded, denticulate within. Sinus deep and broad, near the suture, but surrounded by a thick lip. Inner lip thin, narrow. Columella smooth. *Sculpture:* Protoconch with 1st whorl smooth, the 2nd crossed by threads which, beginning at the upper suture, pass first longitudinally and singly, then at the periphery bifurcate, each branch passing obliquely to the suture, thus reticulating the lower half. Adult whorls entirely reticulated by axial ribs, about 8 on the first whorl and 20 on the body-whorl, overridden by less prominent and narrower spiral ribs, forming transverse beads at the intersections. There are 2 spirals on the first adult whorl, 5 on the penultimate (of which the two upper are smaller than the others), and 13 on the body-whorl counting just behind the outer lip. Of these, the two upper are less prominent than the others. Interstices deep, between the spirals 2 to 3 times the width of the latter, and between the axials about 1½ times the width of the ribs. At the anterior end of the body-whorl the spirals are more prominent than the axials. The transverse ribs of the body-whorl extend over the expanded outer lip. Under the microscope the whole surface is seen to be finely spirally striated. *Colour:* Protoconch light brown, remainder of shell uniformly dark brown. Outer lip with a white patch at the sinus and another near the centre. Inner lip and interior of aperture pale brown.

Height, 4 mm. Diameter, 1·5 mm.

Habitat.—Dead shells abundant in dredgings in 10 m. to 30 m. on gravelly bottom near Sunday Island.

Mitramorpha expeditionis n. sp. Fig. 36.

Description of Type Specimen.—Shell broadly fusiform, broadest about the middle, aperture equal in length to the spire. Whorls 6½, flattened,

suture impressed, the body-whorl ventricose, regularly tapered in front. Aperture long, oblique, posteriorly deflected to the right. Outer lip not thin, acute. Sinus near the suture, deep, with a thick rim. Inner lip broad, thin. Columella flattened, with 2 obscure plications near the middle. Canal short, wide, truncate in front. *Sculpture:* Protoconch of 1½ whorls, smooth. First adult whorl with 2 spiral threads on the periphery, 2nd with 10 sinuous axial ridges overridden by fine spiral threads. The succeeding two whorls are similarly sculptured, the axial ridges and spiral threads being more numerous. Body-whorl with low axial ridges, sinuous near the suture and becoming obsolete at the periphery, the whole overridden by close regular spiral threads. *Colour:* Dark buff, a faint purple spiral band on the lower edge of the spire-whorls. On the body-whorl are sinuous brown marks near the suture.

Height, 5·2 mm. Diameter, 2·2 mm.

Variations from Type.—The colour varies from white to buff, most shells being ornamented with a few irregular brown marks.

Habitat.—Dead shells dredged in 10 m. to 30 m. on gravelly bottom off Sunday Island.

Zafra kermadecensis n. sp. Fig. 37.

Description of Type Specimen.—Shell broadly fusiform, apex obtuse. Whorls 4½, with a flattened periphery, shouldered, suture deep. Aperture narrow, rhomboidal, the outer and inner lips parallel, obliquely truncated in front and behind. Outer lip with a broad and shallow sinus at the suture. Inner lip distinct throughout, narrow and slightly thickened along its straight central and anterior portion. Canal short, wide. *Sculpture:* Protoconch of 1 whorl, smooth. Shell with low rounded axial plications, about 15 on each whorl. Base of body-whorl with several oblique plications. Surface of shell smooth and shining. *Colour:* Protoconch white. Shell glassy, tinged with yellowish. A spiral row of rectangular light yellowish-brown patches on the spire-whorls, one on each alternate plication, and extending from above the periphery to the lower suture. This row is continued on the periphery of the body-whorl. Below it is a clear spiral band, the base being more or less coloured with the same yellowish-brown. Tip of canal clear.

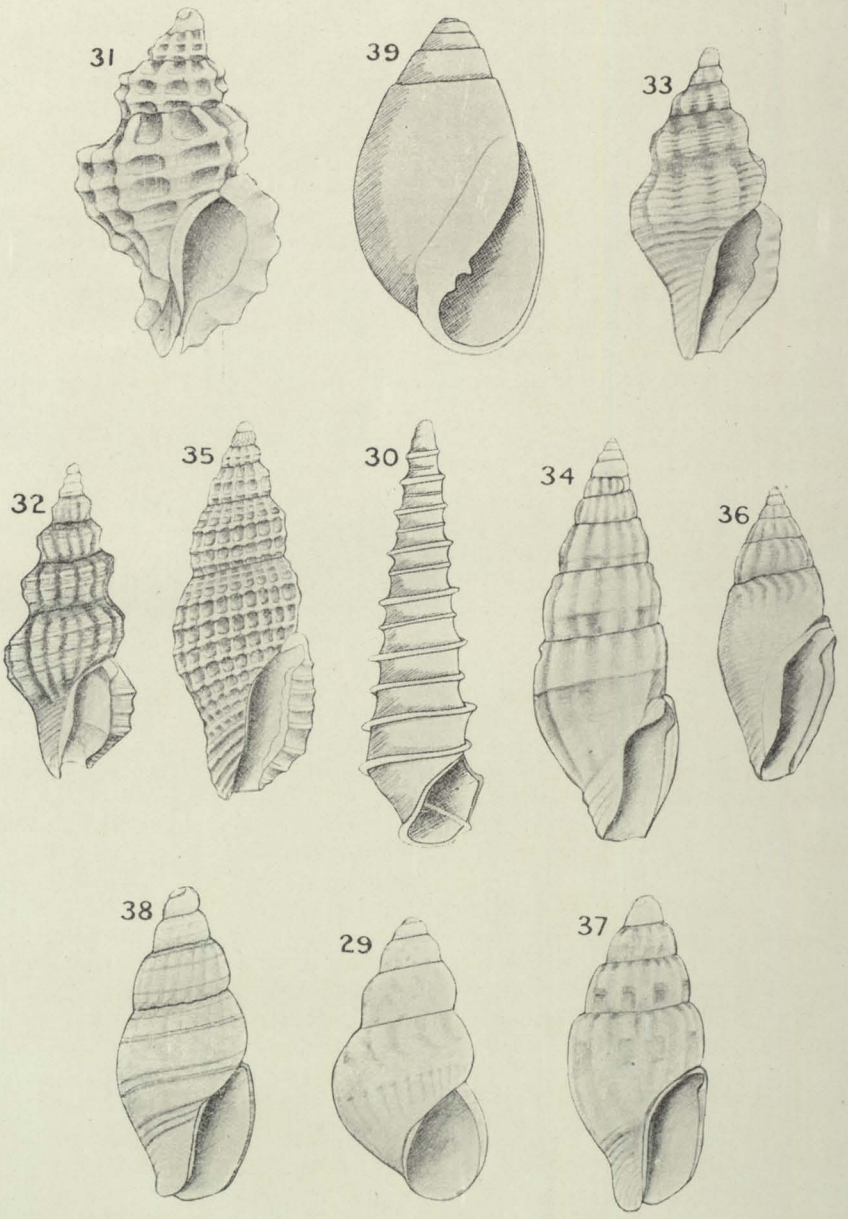
Height, 2·3 mm. Diameter, 1 mm.

Variations from Type.—In some specimens the clear bands above and below the periphery of the body-whorl are ornamented with semicircular brown markings, with their convexity directed towards the aperture.

Habitat.—Dead shells abundant in dredgings on gravelly bottom in 10 m. to 30 m. off Sunday Island.

Zafra fuscolineata n. sp. Fig. 38.

Description of Type Specimen.—Shell broadly fusiform, truncate in front, apex obtuse. Whorls 5, flatly rounded, suture impressed. Aperture oblong, slightly produced in front, outer edge nearly straight, inner edge angled above. Outer lip thin, sinus at the suture, shallow. Inner lip thickened, straight below. Canal short, wide. *Sculpture:* Protoconch of 1½ whorls, smooth. Adult whorls with low, slightly oblique, axial ridges, about 15 on the penultimate whorl, and becoming obsolete on the periphery of the body-whorl. Interstices very shallow, concave. Base with oblique grooves. Over the whole shell there appears under the microscope



KERMADEC ISLAND MOLLUSCA.

Face p. 540.]

fine close spiral striae. *Colour:* Protoconch white, with a spiral brown band in the suture. Remainder of shell creamy white, with a white peripheral band, and light-brown spiral lines disposed as follows: On the spire-whorls, 2, one each side of the white median band, and with a third near the upper suture on the penultimate whorl; on the body-whorl, 1 near the suture, 1 (double) above the white peripheral band, 2 below it, and 3 on the base.

Height, 2·5 mm. Diameter, 1·2 mm.

Variations from Type.—The brown spiral lines vary somewhat in different shells. The line above the periphery on the body-whorl is usually single, while there may be as many as 6 lines on the base.

Habitat.—A few dead shells dredged on gravelly bottom in 10 m. to 30 m. near Sunday Island.

Terebra venosa Hinds.

Terebra venosa Hinds, Pro. Zool. Soc., 1843, 157, 1844.
Recorded, Suter, Trans. N.Z. Inst., 38, 332, 1906.

Habitat.—Dead shells washed up on the beaches, Sunday Island, in large numbers.

Distribution.—Mauritius, Seychelles.

Terebra circumcincta Deshayes.

Terebra circumcincta Desh., Journ. Conch., 77, pl. 3, fig. 9, 1857.

Habitat.—Dredged alive in 30 m. near Sunday Island (R. S. Bell).

Distribution.—Australia, Red Sea.

Conus kermadecensis Iredale.

Conus kermadecensis Iredale, Pro. Mal. Soc., x, 227, 1912.
Recorded, Iredale, *l.c.*

Shells somewhat variable in shape. Two type specimens are in the Canterbury Museum—(*a.*) Height, 47 mm.; diameter, 24 mm.; spire angle, 100°. (*b.*) Height, 43 mm.; diameter, 26 mm.; spire angle, 140°.

Habitat.—Living on rocks just below low-water mark, Meyer Island; common.

Conus vermiculatus Lamarck.

Conus vermiculatus Lam., Anim. s. Vert., vii, 452, 1822.
Recorded, Iredale, Pro. Mal. Soc., ix, 71, 1910.

Perhaps Cheeseman's record of *C. marmoreus* (Trans. N.Z. Inst., 20, 165, 1888) belongs here, as the specimens were small, but they cannot now be found.

Habitat.—Dead shells found on the beaches, Sunday Island.

Distribution.—Lord Howe Island, Pacific Ocean.

Conus minimus Gmelin.

Conus minimus Gmelin, Syst. Nat., ed. xii, 3382, 1791.
Recorded, Iredale, Pro. Mal. Soc., ix, 71, 1910.

Habitat.—Dead shells occasionally found on the beaches at Sunday Island.

Distribution.—Lord Howe Island, Norfolk Island, Indian Ocean, Malaya, New Caledonia.

Conus maculosus Sowerby.

Conus maculosus Sowb., Conch. Illustr., *Conus*, pl. 1, fig. 3, 1833.

Habitat.—A few dead and broken shells found on the beaches at Sunday Island.

Distribution.—Lord Howe Island, Australia, Philippines.

Conus virgo Gmelin.

Conus virgo Gmelin, Syst. Nat., ed. xiii, 3376, 1791.

Habitat.—One imperfect dead shell found on the shore, Sunday Island (R. S. Bell).

Distribution.—New Caledonia, Indian and Pacific Oceans, Malaya.

Acteon flammeus (Gmelin).

Voluta flammeus Gmelin, Syst. Nat., ed. xiii, 3435, 1791.

Habitat.—Dredged alive in 35 m. near Sunday Island.

Distribution.—Indian and Pacific Oceans, Java, Philippines, Australia.

Bullinula ziczac (Muhlfeldt).

Voluta ziczac Muhl., Ges. Nat. Fr. Berlin, Mag. neu. Entdeck, viii, 5, 1818.

Recorded, Iredale, Pro. Mal. Soc., ix, 71, 1910 (*Bullina scabra*).

Habitat.—A few dead shells found on the beaches, Sunday Island.

Distribution.—Norfolk Island, New Zealand, Tasmania, Australia, Pacific and Indian Oceans, Java.

Pugnus parvus Hedley.

Pugnus parvus Hedley, Rec. Austr. Mus., ii, 106, 1896.

Recorded, Iredale, Pro. Mal. Soc., ix, 71, 1910.

Habitat.—A few dead shells dredged on gravelly bottom near Sunday Island.

Distribution.—New South Wales.

Tornatina apicina Gould.

Tornatina apicina Gould, Pro. Bost. Soc. N.H., vii, 139, 1859.

Habitat.—Dead shells abundant in dredgings in 10 m. to 30 m. on gravelly bottom near Sunday Island.

Distribution.—New South Wales.

Cylichnella thetidis (Hedley).

Cylichna thetidis Hedley, Mem. Austr. Mus., iv, 395, 1903.

Habitat.—Dead shells dredged in 10 m. to 30 m. on gravelly bottom near Sunday Island.

Distribution.—New Zealand, Australia.

Bullaria peasiana Pilsbry.

Bullaria peasiana Pilsbry, Man. Conch. (i), xv, 348, 1893.

Recorded, Iredale, Pro. Mal. Soc., ix, 71, 1910 (*B. ampulla*).

Habitat.—Dead shells frequently washed up on the beaches, Sunday Island.

Distribution.—Lord Howe Island, Norfolk Island, Sandwich Islands.

Limacina bulimoides (d'Orbigny).

Atlanta bulimoides d'Orb., Voy. Amér. Mérid., v, 179, 1836.
Recorded, Iredale, Pro. Mal. Soc., ix, 71, 1910.

Habitat.—Dead shells washed up on the beaches, Sunday Island.
Distribution.—All tropical and warm temperate seas.

Limacina inflata (d'Orbigny).

Atlanta inflata d'Orb., Voy. Amér. Mérid., v, 174, 1836.

Habitat.—Dead shells occasionally washed up on the beaches, Sunday Island.
Distribution.—All tropical and warm temperate seas.

Styliola subula (Quoy and Gaimard).

Cleodora subula Q. & G., Ann. Sci. Nat., x, 233, 1827.
Recorded, Iredale, Pro. Mal. Soc., ix, 71, 1910.

Habitat.—Dead shells found on the beaches, Sunday Island.
Distribution.—All tropical and warm temperate seas.

Clio pyramidata Linné.

Clio pyramidata Linné, Syst. Nat., ed. xii, 1094, 1767.
Recorded, Iredale, Pro. Mal. Soc., ix, 71, 1910.

Habitat.—Dead shells found on the beaches, Sunday Island.
Distribution.—All tropical and temperate seas.

Clio acicula (Rang).

Creseis acicula Rang, Ann. Sci. Nat., i, 318, 1828.
Recorded, Iredale, Pro. Mal. Soc., ix, 71, 1910.

Habitat.—Dead shells washed up on the beaches, Sunday Island.
Distribution.—All tropical and warm temperate seas.

Clio virgula (Rang).

Creseis virgula Rang, Ann. Sci. Nat., i, 316, 1828.
Recorded, Iredale, Pro. Mal. Soc., ix, 71, 1910.

Habitat.—Dead shells washed up on the beaches, Sunday Island.
Distribution.—All tropical and warm temperate seas.

Cuvierina columnella (Rang).

Cuvieria columella Rang, Ann. Sci. Nat. (i), xiii, 323, 1827.
Recorded, Iredale, Pro. Mal. Soc., ix, 71, 1910.

Habitat.—Dead shells frequently washed up on the beaches, Sunday Island.
Distribution.—New Zealand; all tropical and warm temperate seas.

Cavolina telemus (Linné).

Monoculus telemus Linné, Syst. Nat., ed. x, 635, 1758.
Recorded, Iredale, Pro. Mal. Soc., ix, 71, 1910 (*C. tridentata*).

Habitat.—Dead shells found on the beaches, Sunday Island.
Distribution.—New Zealand; all tropical and warm temperate seas.

Cavolina trispinosa (Lesueur).

Hyalaea trispinosa Les. in Blainv. Dict. Sci. Nat., xxii, 82, 1821.
Recorded, Iredale, Pro. Mal. Soc., ix, 71, 1910.

Habitat.—Dead shells washed up on the beaches, Sunday Island.
Distribution.—New Zealand; all tropical and warm temperate seas.

Cavolina longirostris (Lesueur).

Hyalaea longirostris Les. in Blainv. Dict. Sci. Nat., xxii, 81, 1821.
Recorded, Iredale, Pro. Mal. Soc., ix, 71, 1910.

Kermadec specimens belong to the variety *strangulata* Hedley (Rec. Austr. Mus., vi, 299, 1907).

Habitat.—Dead shells frequently washed up on the beaches, Sunday Island.
Distribution.—New Zealand; all tropical and temperate seas.

Cavolina inflexa (Lesueur).

Hyalaea inflexa Les., Nouv. Bull. Soc. Philom., iii, 285, 1813.
Recorded, Iredale, Pro. Mal. Soc., ix, 71, 1910.

Habitat.—Dead shells found on the beaches, Sunday Island.
Distribution.—New Zealand; all tropical and warm temperate seas.

Cavolina gibbosa (Rang).

Hyalaea gibbosa Rang in d'Orb. Voy. Amér. Mérid., v, 95, 1836.

Habitat.—Dead shells rarely washed up on the beaches at Sunday Island.
Distribution.—All tropical and warm temperate seas.

Cavolina quadridentata (Lesueur).

Hyalaea quadridentata Lesueur in Blainv. Dict. Sci. Nat., xxii, 81, 1821.

Habitat.—Dead shells rarely washed up on the beaches, Sunday Island.
Distribution.—All tropical and warm temperate seas.

Theceurybia gaudichaudi (Souleyet).

Euribia gaudichaudi Soul., Voy. "Bonite," Zool., t. 2, p. 253, 1852.
Recorded, Pelseneer, "Challenger" Rep., xix, pt. 58, 55, 1887.

Habitat.—Taken on the surface of the ocean between Sunday and Macauley Islands ("Challenger" Expedition).
Distribution.—Philippines.

Umbraculum umbellum (Martyn).

Patella umbella Martyn, Un. Conch., iii, pl. 102, 1786.
Recorded, Iredale, Pro. Mal. Soc., ix, 71, 1910.

Habitat.—Living among rocks near low-water mark, Coral Bay, Sunday Island.
Distribution.—Norfolk Island, New Zealand, Australia, Indian and Pacific Oceans.

Heteroplocamus n. gen. for *Euplocamus* Philippi, preoccupied.

Type.—*Euplocamus pacificus* Bergh.

Heteroplocamus pacificus Bergh.

Euplocamus pacificus Bergh, " Challenger " Rep., x, pt. 26, 57, 1884.
Recorded, Bergh, *l.c.*

Habitat.—Dredged in 1,150 m., between Sunday and Macauley Islands, on volcanic mud (" Challenger " Expedition).

Glaucilla atlanticus (Forster).

Glaucus atlanticus Forster, Voy. " Resolution," i, 49, 1777.

Habitat.—Live specimens frequently washed up on the beaches, Sunday Island.
Distribution.—Atlantic Ocean.

Leuconopsis pacifica n. sp. Fig. 39.

Description of Type Specimen.—*Shell* thin, ovate, apex obtuse. Whorls 4, those of the spire flat, shouldered above, their sides nearly parallel, and, as they decrease in size towards the apex, form a step-like series. Aperture narrowly pyriform. Outer lip thick in front, suddenly becoming thin behind with a free rounded edge, thus forming a narrow posterior canal. Inner lip a broad callous smear. Columella with 3 plaits, the central one largest. Shell smooth with axial growth-lines, white.
Height, 2·7 mm. Diameter, 1·5 mm.
Variations from Type.—The upper columella plication, weak in the type, is absent in all other specimens. The type is the largest specimen seen.
Habitat.—Dead shells rarely found in dredgings in 10 m. to 30 m. off Sunday Island.

Melampus albus Gassies.

Melampus albus Gassies, Journ. Conch., xiii, 211, 1865.

Habitat.—Dead shells dredged on gravelly bottom near Sunday Island.
Distribution.—New Caledonia.

Siphonaria.

The representatives of this genus in the Kermadec Islands recall *Cellana* in the multiplicity of forms and the difficulty of dividing them into specific groups with satisfactory limits. I have a good series of specimens from Sunday Island, Macauley Island, and French Rock, and on comparing them with what specimens are available to me from Norfolk Island, New Zealand, Australia, and Tasmania I find that all appear to be distinct from the species of those countries. The chief affinities lie with Norfolk Island and New Zealand. I separate the Kermadec specimens into four species. Here, as in *Cellana*, there seems to be some relation between specific divergence on the one hand, and habitat and distribution on the other, for the three principal species found at Sunday Island affect distinct habitats, while the dominant forms on Macauley Island and French Rock differ from each other and from those on Sunday Island. Hiding in crevices of rocks near high-water mark on Sunday Island is the small *S. amphibia;* lower down the high and polished *S. raoulensis* occurs; while near low-water mark is found abundantly the remarkable *S. cheesemani*, usually coated with crustaceous algae, and often adhering to the great shells of *Scutellastra kermadecensis.*

Siphonaria raoulensis n. sp. Figs. 40 and 40*a*.

Recorded, Suter, Trans. N.Z. Inst., 39, 265 (*S. diemenensis*).

Description of Type Specimen.—Shell ovate-elliptical, conoidal, height 0·39 of length. Right side straight in centre, then rather sharply turning to either end. Apex a little behind the centre, directed backwards and to the left. Anterior slope slightly arched, posterior nearly straight. Margin fairly regular and crenulated, chiefly on the right side. Siphonal groove not prominent. *Sculpture:* There are about 40 rounded smooth and polished radiating ribs. These are irregular in size, the larger ones being chiefly on the posterior slope, while there are 2 prominent ones on the siphonal groove. *Colour:* Bluish, darker towards the centre, the ribs nearly white, especially near the margin. Interior light-bluish, the margin nearly black, with white transverse bands opposite the ribs. At the siphonal groove 2 white bands extend about half-way towards the apex.

Length, 18 mm. Breadth, 12·8 mm. Height, 7 mm.

Variations from Type.—The ribs vary somewhat in prominence, and the general shape of the shell is liable to variation, as will be seen by the following measurements: (*a*.) Length, 19·6 mm.; breadth, 15·6 mm.; height, 6·4 mm.; ratio height to length (L. = 100), 0·31. (*b*.) Length, 19·8 mm.; breadth, 14·5 mm.; height, 7 mm.; ratio height to length, 0·28. (*c*.) Length, 17 mm.; breadth, 13 mm.; height, 7 mm.; ratio height to length, 0·24. The colour varies somewhat. The interior is sometimes nearly white or yellowish, with a black-banded margin. The apex is occasionally eroded and whitish. Most of my specimens were collected on rocks adjoining sandy beaches, and show the effects of sand-rubbing in their highly polished surfaces.

Habitat.—Living on rocks between tide-marks, Sunday Island; plentiful in places.

Siphonaria cheesemani n. sp. Figs. 41 and 41*a*.

Description of Type Specimen.—Shell elliptical, slightly narrowed in front, very depressed, height 0·21 of length, slopes nearly straight. Margin deeply incised, the principal ribs projecting to a distance equal to their width, slightly crenulated between the projecting ribs. Siphonal groove a double rib, but not more prominent or projecting further than the other large ribs. *Sculpture:* There are 13 high rounded radiating ridges, each projecting beyond the margin. The anterior ridges slightly smaller than the posterior. Ridges irregularly spaced, the largest interstice being behind the siphonal groove, the second-largest immediately posteriorly to this. Between the principal ribs are smaller riblets, chiefly noticeable on the right side. The whole upper surface covered with crustaceous algae, apex eroded. *Colour:* Interior nearly black, with a central white spot. Margin darker, with white bands opposite the ribs and riblets.

Length, 17·3 mm. Breadth between parallels touching the ribs, 13·5 mm. Height, 3·7 mm.

Variations from Type.—There being no adult specimens collected that were not covered with algae, I am obliged to add the following particulars from a smaller beach specimen: Apex situated behind and to the left of the centre and directed away from the centre. Between the principal ribs are fine close riblets. Concentric growth-lines show over the whole surface.

The number of principal ribs varies in different shells, being usually more than in the type, while the anterior ribs are frequently smaller and more numerous than in the type.

Habitat. — Abundant living on rocks near low-water mark, Sunday Island. The shells almost always covered with crustaceous algae, and sometimes found attached to shells of *Scutellastra kermadecensis*. In its depressed form it resembles a number of marine molluscs inhabiting the lowest portion of the littoral belt.

Siphonaria macauleyensis n. sp. Figs. 42 and 42*a*.

Description of Type Specimen.—Shell irregularly ovate, high, conical, height 0·48 of length. Anterior slope long, arched; posterior slope steep, nearly straight. Apex nearly two-thirds the length of the shell from the anterior end, and to the left of the central line, directed backwards. Margin fairly regularly crenulated. Siphonal groove scarcely projecting. *Sculpture:* About 45 close nearly regular radiating ribs, two on the siphonal groove and a few others here and there on the posterior half larger than the others. All crossed by concentric growth-lines. *Colour:* Above grey, the ribs nearly white. Interior whitish in the centre, muscle-impression brown, followed by a whitish band and a dark-brown margin crossed by white bands opposite the ribs.

Length, 19·6 mm. Breadth, 14·6 mm. Height, 9·5 mm.

Variations from Type.—There is a good amount of variation in the shape of the shell, prominence of the ribs, and especially of the siphonal groove, which sometimes projects a considerable distance. When this is the case with depressed forms they come very close to the subspecies *perplexa*. The depth of colour inside varies, some examples having the central portion all brown. The following measurements show variations in the shells: (*a*.) Length, 19·5 mm.; breadth, 16·2 mm.; height, 10 mm.; ratio height to length (L.=100), 0·51. (*b*.) Length, 19·3 mm.; breadth (behind siphonal groove), 15·5 mm.; height, 6·2 mm.; ratio height to length, 0·32.

A few specimens which I collected on French Rock apparently belong to this species. They are larger than those from Macauley Island, and all have the upper surface either corroded or covered by coralline algae, so that the sculpture is obscured. The general shape and the colour of the interior, however, agrees with Macauley Island specimens. Length, 23 mm.; breadth, 18·5 mm.; height, 8·3 mm.

S. macauleyensis comes very close to *S. exulorum* from Norfolk Island, differing principally in the more irregular shape and ribbing, and in the more posterior position of the apex. *S. zealandica* is also allied, but easily distinguishable from the above two.

Habitat.—Living on rocks between tide-marks, Macauley Island (type locality) and French Rock; common. A few specimens were also obtained on Sunday Island.

Subsp. perplexa n. subsp. Figs. 43 and 43*a*.

Recorded, Iredale, Pro. Mal. Soc., ix, 71, 1910 (*S. atra*).

Description of Type Specimen.—Shell depressed, height 0·29 of length, ovate, left side slightly rounded in the centre, sloping sharply away at either end, right side semicircular. Apex subcentral. Slopes slightly arched. Margin irregularly crenulated. Siphonal groove high, angular, and projecting for a distance equal to one-third of that between margin and apex. *Sculpture:* Irregularly spaced straight or wavy radiating ribs, about 20 principal ones, including 2 on the siphonal groove. They are of various sizes, those on the left side and alternate ones on the posterior half

being larger than the others. There are smaller riblets in the interstices, including those on the siphonal groove and a wide space between it and the next posterior large rib. *Colour:* Above bluish-grey, the ribs nearly white. Apex corroded. Interior bluish-brown, the margin darker, and with numerous white cross-bands opposite the ribs.

Length, 17·3 mm. Breadth behind siphonal groove, 13·2 mm. Height, 5 mm.

The type specimen of this subspecies differs considerably from that of the typical subspecies, but intermediate forms which might be referable to either are common, so that I could not divide them satisfactorily into two groups, hence the present arrangement under one species. *S. cheesemani* also in some of its forms approaches the subspecies *perplexa*.

Habitat.—Living on rocks near low-water mark, Sunday Island.

Siphonaria amphibia n. sp. Fig. 44.

Description of Type Specimen.—Shell small, ovate, narrowed in front, conoidal, height 0·35 of length. Apex behind the centre, anterior slope slightly curved, posterior slope straight. Margin irregular, siphonal groove slightly projecting. *Sculpture:* The upper half of the shell corroded. Margin with about 25 scarcely raised radiating ribs. *Colour* brown, the ribs white. Interior black, the margin crossed by white bands opposite the ribs.

Length, 7·8 mm. Breadth, 6·2 mm. Height, 2·7 mm.

Variations from Type.—Most of the shells have the interior entirely black, and in many the entire upper surface is corroded.

Habitat.—This little species was found living in crevices and irregularities of rocks near high-water mark at Fleetwood Bluff, Sunday Island. In size, appearance, and habits it resembles some small species of *Acmaea* which occur in similar situations in New Zealand.

Gadinia conica Angas

Gadinia conica Angas, Pro. Zool. Soc., 1867, 115, 1868.
Recorded, Iredale, Pro. Mal. Soc., ix, 71, 1910.

Habitat.—Living on rocks between tide-marks, Sunday Island.
Distribution.—New Zealand, Australia.

Helicarion kermadecensis (Smith).

Vitrina kermadecensis E. A. Smith, Ann. Mag. Nat. Hist. (4), xi, 288, 1873.
Recorded, E. A. Smith, *l.c.*

Habitat.—Living on the under-surfaces of the leaves of the nikau palm (*Rhopalostylis Baueri*) on the summit of Moumoukai, the highest point of Sunday Island. Found only during wet weather, October. 1908. Also found living under dead leaves on the ground.

Ptychodon royanus Iredale.

Ptychodon royanus Iredale, Pro. Mal. Soc., x, 377, 1913.
Recorded, Iredale, *l.c.*

Habitat.—Living on the moss-covered trunks of trees, Sunday Island.

Ptychodon pseutes Iredale.

Ptychodon pseutes Iredale, Pro. Mal. Soc., x, 378, 1913.
Recorded, Iredale, *l.c.*

Habitat.—Living on the ground under stones, rotten wood, and dead palm-leaves, Sunday Island.

Ptychodon amandus Iredale.

Ptychodon amandus Iredale, Pro. Mal. Soc., x, 378, 1913.
Recorded, Iredale, *l.c.*

Habitat.—Living on the ground under stones, wood, and dead palm-leaves, Sunday Island.

Charopa macgillivrayana Iredale.

Charopa macgillivrayana Iredale, Pro. Mal. Soc., x, 379, 1913.
Recorded, Iredale, *l.c.*

Habitat.—Living on the ground under stones, wood, and leaves on high land only, Sunday Island.

Charopa exquisita Iredale.

Charopa exquisita Iredale, Pro. Mal. Soc., x, 379, 1913.
Recorded, Iredale, *l.c.*

Habitat.—Living on the ground under stones, wood, and leaves, Sunday Island.

Charopa pseudanguicula Iredale.

Charopa pseudanguicula Iredale, Pro. Mal. Soc., x, 380, 1913.
Recorded, Iredale, *l.c.*

Habitat.—Living on the moss-covered trunks of trees, Sunday Island.

Flammulina miserabilis Iredale.

Flammulina miserabilis Iredale, Pro. Mal. Soc., x, 383, 1913.
Recorded, Iredale, *l.c.*

Habitat.—Living on moss-covered trunks of trees, Sunday Island.

Paralaoma raoulensis Iredale.

Paralaoma raoulensis Iredale, Pro. Mal. Soc., x, 381, 1913.
Recorded, Iredale, *l.c.*

Iredale describes a second species of *Paralaoma* from Sunday Island. I have some hundreds of specimens, which, though the number of lamellae varies, can scarcely be separated into two definable groups. I therefore treat his species as subspecies, which, using his diagnoses, may be thus defined:—

Subsp. *typica.*—Periphery rounded, lamellae on last whorl usually exceeding 40.

Subsp. *ambigua* (Iredale).—Periphery semi-keeled, lamellae on last whorl usually less than 30.

Habitat.—Living on the ground under stones, rotten wood, and dead leaves, Sunday Island.

Calymna arboricola Iredale.

Calymna arboricola Iredale, Pro. Mal. Soc., x, 383, 1913.
Recorded, Iredale, *l.c.*

Habitat.—Living on moss-covered trunks of trees, Sunday Island.

Fanulum expositum (Mousson).

Trochonanina exposita Mousson, Journ. de Conch., xxi, 111, 1873.
Recorded, Mousson, *l.c.*

Var. *moumoumkai* Iredale.—Shell yellowish-white. Single specimens only found. Possibly these are albinos. I think they scarcely justify a name.

Habitat.—Living on the ground under rotten palm-leaves in scattered colonies on the higher ground only, Sunday Island.

Kieconcha kermadeci (Pfeiffer).

Helix kermandeci Pfeiffer, Pro. Zool. Soc., 1856, 326, 1857.
Recorded, Pfeiffer, *l.c.*

Habitat.—Living on the ground under rotten wood and palm-leaves. Found sporadically over the whole of Sunday Island.

Elasmias inconspicua (Brazier).

Tornatellina inconspicua Brazier, Pro. Zool. Soc., 1872, 619, 1873.
Recorded, Iredale, Pro. Mal. Soc., x, 386, 1913.

Habitat.—In Denham Bay, Sunday Island, living on a patch of kawa-kawa (*Macropiper excelsum*). Found during rain crawling on the stems and under-surfaces of the leaves.
Distribution.—Lord Howe Island.

Tornatellina novoseelandica (Pfeiffer).

Tornatellina novoseelandica Pfeiffer, Hel. Viv., iii, 524, 1853.
Recorded, Pfeiffer, 1863 (Iredale, Pro. Mal. Soc., x, 386, 1913).

Habitat.—Living on the trunks of trees and palms, Sunday Island.
Distribution.—New Zealand.

Tornatellina subperforata Suter.

Tornatellina subperforata Suter, Pro. Mal. Soc., viii, 263, 1909.
Recorded, Suter, *l.c.*

Habitat.—Living on the ground under stones, leaves, and wood, Sunday Island; extremely abundant. This is the species which Iredale (Pro. Mal. Soc., x, 364, and Trans. N.Z. Inst., 47. p. 481, *ante*) refers to *T. novoseelandica*.
Distribution.—New Zealand.

LAMELLIBRANCHIA.

Pronucula kermadecensis n. sp. Fig. 45.

Description of Type Specimen.—Shell small, very inequilateral, obliquely ovate, beaks at about the posterior fourth, directed backwards. Anterior end sloping, rounded in front, posterior end shortly rounded. Escutcheon indistinctly marked. Hinge with a triangular resilium directed forwards, a series of hinge-teeth on either side of the resilium, 8 anterior and 3 posterior, decreasing in size towards the apex. Adductor-scars scarcely impressed,

nearly equal, pallial line indistinct. *Sculpture:* There are regularly spaced low concentric riblets, variable in size, the larger ones being nearer the margin, crossed by fine close radiating striae. *Colour* yellowish-white.

Diameter—Dorso-ventral, 1·4 mm.; ant.-post., 1·8 mm.

Variations from Type.—Dead shells are white; epidermis on live shells thin, pale olive.

Habitat.—Live shells collected at Sunday Island by R. S. Bell.

Placunanomia zelandica (Gray).

Anomia zelandica Gray in Dieff. N.Z., 260, 1843.
Recorded, Iredale, Pro. Mal. Soc., ix, 71, 1910 (*P. ione*).

Habitat.—Dead shells frequently washed up on the beaches, Sunday Island.

Distribution.—New Zealand, Australia.

Arca foliata Forskal.

Arca foliata Forskal, Descr. Anim., p. xxxi, 1775.
Recorded, Iredale, Pro. Mal. Soc., ix, 71, 1910.

Habitat.—Dead shells found on the beaches, Sunday Island.

Fossil.—In coarse volcanic gravel cemented by calcite, Titi Knob, Sunday Island; and in hard sandy tuffs of submarine origin, Deyrell Islet. (*A. decussata* Oliver, Trans. N.Z. Inst., 43, 527.)

Distribution.—Australia, Indo-Pacific region.

Arca reticulata Gmelin.

Arca reticulata Gmelin, Syst. Nat., ed. xiii, 3311, 1790.
Recorded, Iredale, Pro. Mal. Soc., ix, 71, 1910 (*A. domingensis*).

Habitat.—Living specimens found attached to the underside of stones in rock-pools, Sunday Island and Meyer Island.

Distribution.—New Zealand, Tasmania, Australia, Japan, Atlantic coasts, Funafuti, Lord Howe Island, Norfolk Island.

Philobrya costata (Bernhard).

Hochstetteria costata Bernhard, Bull. d. Nat. Mus., ii, 1896.
Recorded, Iredale, Pro. Mal. Soc., ix, 71, 1910.

Habitat.—Single valves common in dredgings in 10 m. to 30 m. off Sunday Island. Colour varying from dark pink to white.

Distribution.—New Zealand.

Philobrya meleagrina (Bernhard).

Hochstetteria meleagrina Bernhard, Bull. d. Nat. Mus., ii, 1896.

Habitat.—Extremely abundant living among the densely growing alga *Pterocladia capillacea* on rocks about and below low-water mark, Sunday Island.

Distribution.—New Zealand.

Mytilus canaliculus Martyn.

Mytilus canaliculus Martyn, Univ. Conch., ii, fig. 78, 1784.
Recorded, Suter, Man. N.Z. Moll., 864, 1913.

Distribution.—New Zealand, Tasmania.

Modiolus auriculatus Krauss.

Modiolus auriculatus Krauss, Sudafrik. Moll., 20, 1848.
Recorded, Iredale, Pro. Mal. Soc., ix, 71, 1910.

Habitat.—Living in rock-pools and crevices of rocks at low-water mark (not common), Sunday Island.
Distribution.—Lord Howe Island, Norfolk Island, Australia, Indian Ocean.

Lithophaga straminea (Dunker).

Lithodomus straminea Dunker, Reeve, Conch. Icon., x, fig. 11, 1858.
Recorded, Iredale, Pro. Mal. Soc., ix, 71, 1910.

Habitat.—Dead shells found on the beaches, Sunday Island.
Distribution.—Australia, Indo-Pacific region.

Septifer bilocularis (Linné).

Mytilus bilocularis Linné, Syst. Nat., ed. x, 705, 1758.
Recorded, Iredale, Pro. Mal. Soc., ix, 72, 1910.

Habitat.—Living among the alga *Corallina officinalis* in rock-pools between tide-marks, Sunday Island.
Distribution.—Australia, Indo-Pacific region.

Musculus impacta (Hermann).

Mytilus impactus Hermann, Naturforscher, xvii, pl. 3, figs. 5–8, 178, 1782.
Recorded, Iredale, Pro. Mal. Soc., ix, 72, 1910 (*Modiolaria*).

Habitat.—Dead shells found on the beaches, Sunday Island.
Distribution.—New Zealand, Australia.

Pinclada vulgaris (Schum.).

Perlamater vulgaris Schumacher, Essai, 108, 1817.
Recorded, Suter, Trans. N.Z. Inst., 38, 316, 1906 (*Meleagrina radiata*).

Habitat.—Small live specimens found in rock-pools between tide-marks, Sunday Island.
Distribution.—Lord Howe Island, Norfolk Island, Indo-Pacific region.

Melina nucleus (Lamarck).

Perna nucleus Lam., Anim. s. Vert., vii, 78, 1836.
Recorded, Iredale, Pro. Mal. Soc., ix, 72, 1910.

Habitat.—Living in crevices of rocks between tide-marks, Sunday Island.
Distribution.—Indo-Pacific region.

Malleus legumen Reeve.

Malleus legumen Reeve, Conch. Icon., xi, pl. 1, fig. 2, 1858.
Specimens from the Kermadec Islands are in Mr. Suter's collection.
Distribution.—Australia, Malaya.

Julia exquisita Gould.

Julia exquisita Gould, Pro. Bost. Soc. N.H., viii, 284, 1862.
Recorded, Iredale, Pro. Mal. Soc., ix, 72, 1910.

Habitat.—Single valves of this beautiful little shell occurred rarely in dredgings in 10 m. to 30 m. on gravelly bottom near Sunday Island.
Distribution.—Queensland, Hawaii, Indian Ocean.

Spondylus raoulensis n. sp. Fig. 49.

Description of Type Specimen.—Right valve attached to rock, irregular, very deep at apex. Hinge-line straight, sides expanding at first gradually then suddenly, forming a nearly circular outline. Planes of hinge area and margin at right angles, contour of margin viewed laterally convex. Hinge area triangular, slightly concave, sides sinuous. Hinge-teeth projecting, with a deep cartilage-pit between them. *Sculpture:* Hinge area smooth, surface in contact with rock rough and irregular, otherwise with indistinct radiating ribs and concentric growth-lines. *Colour* pink; purplish on the angles of the hinge area; apex and hinge area mostly white.

Diameter—Dorso-ventral, 63 mm.; ant.-post., 54 mm. Hinge area—Base, 30 mm.; height, 27 mm.

Left valve (of another specimen) irregular, shallow. Cartilage-pit narrow, triangular, formed by two raised ridges on hinge-plate converging at apex. Hinge-teeth high, rounded, their dorsal face overhanging a marginal groove. *Sculpture:* There are 12 prominent but irregular radiating ridges, of which 6 high ones alternate with 6 lower ones. The interspaces with close, wavy, lamellated, radiating ribs, slightly irregular in size *Colour* pink, darker on the ridges and ears.

Diameter—Dorso-ventral, 73 mm.; ant.-post., 72 mm.

Variations from Type.—Large shells are massive and heavy. The angle of the planes of hinge area and margin increase with age. The colour varies, some shells being entirely purplish, others with much yellowish diffused with pink, but the ears and angles of the hinge area are usually purplish. Large right valve: Diameter—dorso-ventral, 125 mm.; ant.-post., 98 mm. Angle of planes of hinge area and margins, 135°. The hinge area varies in outline, and the apex points either forward or backward. Young specimens have spines on the ridges; these are probably worn off the types, which are beach specimens.

Habitat.—Single valves, often of large size, commonly washed up on the beaches, Sunday Island. A fragment of pumicestone with a small live shell attached was dredged in 25 m. off Sunday Island by R. S. Bell.

Fossil.—Common in hard sandy tuffs of submarine origin, Deyrell Islet. (*S. ostreoides* Oliver, Trans. N.Z. Inst., 43, 527.)

Spondylus ostreoides E. A. Smith.

Spondylus ostreoides E. A. Smith, "Challenger" Rep., xiii, pt. 35, 326, 1885.

Recorded, E. A. Smith, *l.c.*

Habitat.—Two single valves dredged in 950 m. south of Sunday Island ("Challenger" Expedition).

Cyclopecten kermadecensis (E. A. Smith).

Pecten kermadecensis E. A. Smith, "Challenger" Rep., xiii, pt. 35, 302, 1885.

Recorded, E. A. Smith, *l.c.*

Habitat.—Two valves dredged in 1,100 m. north of Sunday Island on hard ground ("Challenger" Expedition).

Pecten medius Lamarck.

Pecten medius Lamarck, Anim. s. Vert., vi, 163, 1819.

Habitat.—Dredged alive in 30 m. off Meyer Island (W. S. Bell).

Distribution.—New Zealand, Tasmania, Australia.

Chlamys cellularis n. sp. Fig. 46.

Description of Type Specimen.—Left valve triangularly orbicular, flatly rounded. Anterior ear one-third the length of the shell, triangular, its outer edge sinuous, a shallow groove and sinus at its inner margin. Posterior ear narrowly triangular. Disc with the dorsal margins sharply descending, very slightly concave; rounded and descending somewhat along the anterior, basal, and posterior margins, which are slightly crenulate. Resilifer obliquely triangular. The epidermis usually persists, especially in the interstices between the ribs, as a cellular covering, giving the shell a characteristic honeycomb appearance. *Sculpture:* Anterior ear with 6 radiating ribs, the 3 outer ones broad and flattened, the 3 inner ones about half the width of the outer. Posterior ear with small radiating ribs. Disc with 15 principal radiating ribs, the 2 central ones are smaller than the others. The upper surface of the ribs divided by 2 grooves into 3 riblets, of which the central one is largest. In the interstices are 2 riblets in the angles at the bases of the principal ribs, leaving a wide and deep channel in the centre, and grooves the width of the riblets between them and the principal ribs. The surface of the shell presents a microscopically reticulated appearance, apparently due to the growth of the epidermal covering. The marginal portion of the riblets has a series of projecting shelly scales. Interior prominently grooved. *Colour* white, diffused with pink, chiefly on the ribs, and as 3 concentric broad bands on the upper portion of the disc. Base of ears with pink blotches.

Diameter—Ant.-post., 18·5 mm.; dorso-ventral, 20·2 mm.

Variations from Type.—Right valve with the anterior ear oblong, obliquely truncated, a deep byssal sinus below; posterior ear narrowly triangular. The colour is variable. The irregular pink markings are present on all the specimens seen, and are arranged in more or less defined concentric bands. The ground-colour on one shell is lemon-yellow.

Habitat.—The only specimens obtained were single valves found on the beaches at Sunday Island.

Fossil.—A valve apparently referable to this species was found on Deyrell Islet in hard sandy tuffs of submarine origin. (*Pecten kermadecensis* Oliver, Trans. N.Z. Inst., 43, 527, 1911.)

Limatula bullata (Born).

Ostrea bullata Born, Mus. Caes. Vindobin, 110, 1780.
Recorded, Iredale, Pro. Mal. Soc., ix, 72, 1910 (*Lima*).

Habitat.—Valves common in dredgings in 10 m. to 30 m. near Sunday Island.

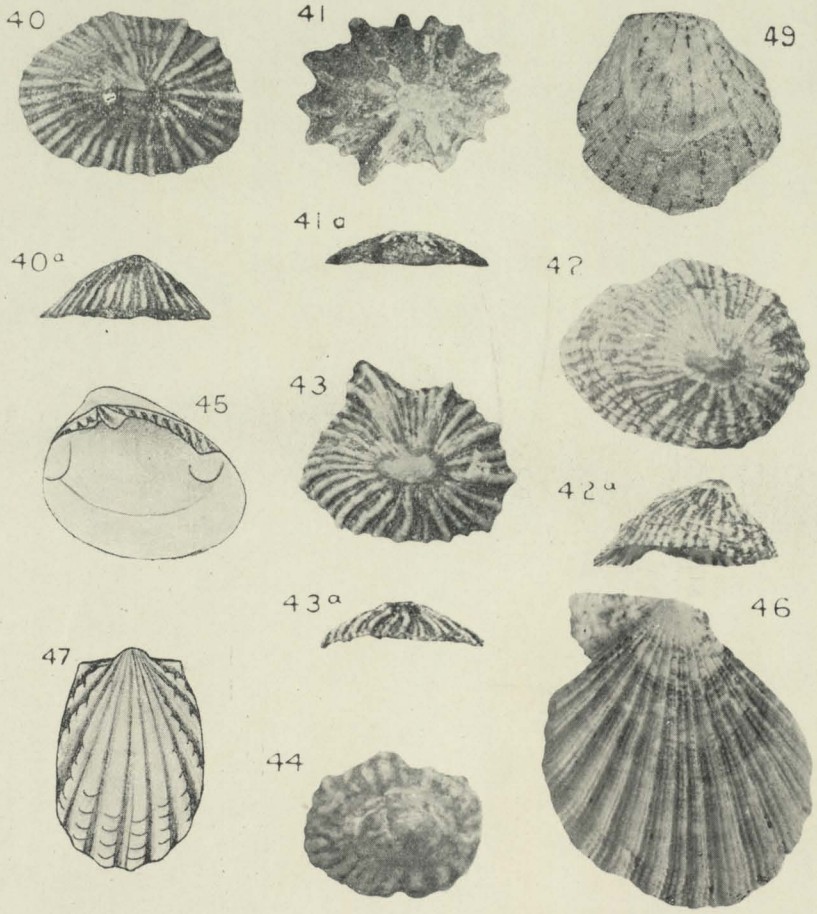
Distribution.—New Zealand, Tasmania, Australia, Pacific, Philippines.

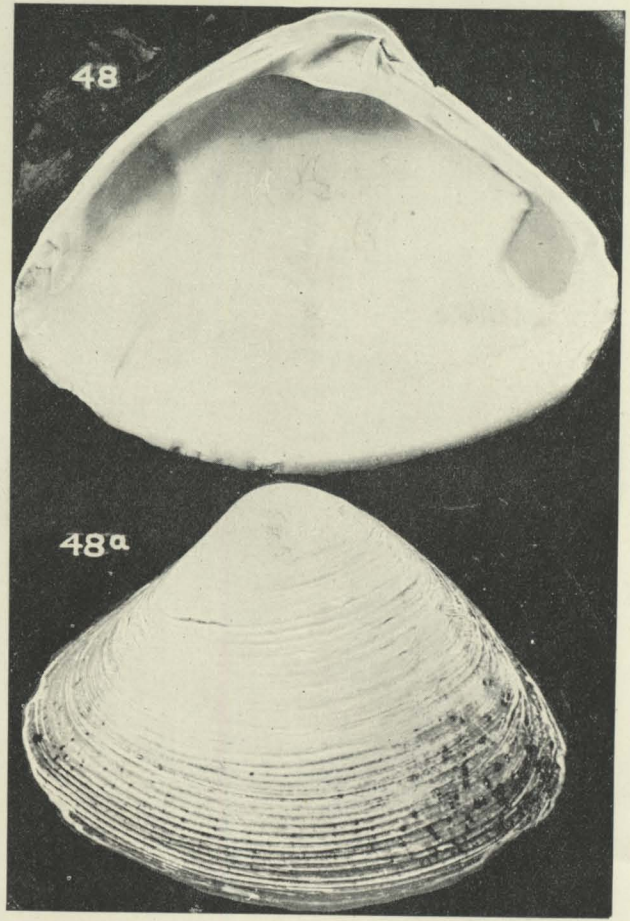
Limatula insularis n. sp. Fig. 47.

Description of Type Specimen.—Shell ovate-oblong, very slightly oblique, ventricose, posterior end slightly more convex than anterior end. Beaks incurved, distant. Ears small, nearly equal. Hinge area straight, lenticular. *Sculpture:* On each valve are 12 rounded radiating ribs, the interstices and ribs about equal in width. These are crossed by close concentric growth-lines, and, near the margins, projecting shelly scales, most prominent at the posterior and anterior ends. *Colour* white.

Diameter—Ant.-post., 2·3 mm.; dorso-ventral, 3·5 mm. Thickness, 2·1 mm.

Face p. 554.]





Kermadec Island Mollusca.

Variations from Type.—The number of ribs varies a little, and may be as high as 15 on each valve. The largest specimen collected measures 3 mm. by 4·4 mm.

Habitat.—Dredged alive near Sunday Island (R. S. Bell).

Codakia bella (Conrad).

Lucina bella Conrad, Journ. Acad. Sci. Phila., vii, 254, 1834.
Recorded, Iredale, Pro. Mal. Soc., ix, 72, 1910.

Habitat.—Live specimens fairly plentiful in sand in rock-pools, Meyer Island.

Distribution.—Australia, Indo-Pacific region.

Diplodonta zelandica (Gray).

Lucina zelandica Gray in Yate's N.Z., 309, 1835.
Recorded, Iredale, Pro. Mal. Soc., ix, 72, 1910.

Habitat.—Dead shells found on the beaches, Sunday Island.

Distribution.—New Zealand, Tasmania, Australia.

Lasaea miliaris Philippi.

Lasaea miliaris Philippi, Wiegman's Archiv. f. Natur., 51, 1845.
Recorded, Iredale, Pro. Mal. Soc., ix, 72, 1910.

Habitat.—Extremely abundant living among the alga *Corallina officinalis* on rocks between tide-marks, Sunday Island.

Distribution.—New Zealand, Lord Howe Island, North Atlantic, Cape of Good Hope, Magellan Straits.

Ervilia bisculpta Gould.

Ervilia bisculpta Gould, Pro. Bost. Soc. N.H., viii, 28, 1861.
Recorded, Iredale, Pro. Mal. Soc., ix, 72, 1910.

Habitat.—Dead shells found on the beaches, Sunday Island.

Distribution.—Australia, Hawaii, Japan, Philippines.

Spisula belliana n. sp. Figs. 48 and 48*a*.

Description of Type Specimen.—Left valve large, solid, somewhat ventricose, trigonal, slightly inequilateral. Posterior dorsal margin arched, anterior straight. Basal margin regularly arched. Anterior and posterior ends subangulated. Posterior dorsal area flattened and laterally bluntly angled. Lunular area lenticular, well defined. Beak incurved, acute. Hinge: Cardinal bifurcating below, lateral laminae high, stout, depression between cardinal and anterior lateral deep. Resilifer obliquely triangular, apex acute. Ligament very short. Adductor-scars deeply impressed, anterior the smaller. Pallial sinus extending about half-way to the anterior adductor, posteriorly coalescent with the pallial line. Epidermis thin, horny. *Sculpture:* There are regular smooth concentric riblets, most prominent at the margins (the apical region is worn smooth and without epidermis). *Colour* white; epidermis yellow with reddish-brown spots.

Diameter—Dorso-ventral, 64 mm.; ant.-post., 83 mm.; transverse (to plane of margin), 17 mm.

Variation from Type.—Right valve with 2 small cardinals coalescing above, 2 anterior and 2 posterior lamellae, the anterior the longer.

Habitat.—Two valves found washed up on the beaches, Sunday Island (R. S. Bell).

Chione toreuma (Gould).

Venus toreuma Gould, Pro. Bost. Soc. N.H., iv, 277, 1850.
Recorded, Iredale, Pro. Mal. Soc., ix, 72, 1910.

Habitat.—Single valves occasionally washed up on the beaches at Sunday Island.

Fossil.—In volcanic gravel cemented by calcite, Titi Knob, Sunday Island. (*Chione* sp. Oliver, Trans. N.Z. Inst., 43, 530.)

Distribution.—Australia, Pacific Ocean.

Lutraria magna (Costa).

Chama magna Costa, Brit. Conch, 230, 1778.
Recorded, Iredale, Pro. Mal. Soc., ix, 72, 1910 (*L. oblonga*).

Habitat.—Valves dredged near Sunday Island.

Distribution.—Australia, Indo-Pacific region.

Protocardia pulchella (Gray).

Cardium pulchellum Gray in Dieff. N.Z., 252, 1843.

Habitat.—Dredged in 30 m. off Meyer Island (W. S. Bell).

Distribution.—New Zealand, Tasmania, Australia, Norfolk Island.

Chama foliacea Quoy and Gaimard.

Chama foliacea Q. & G., Voy. "Astrolabe," Zool., iii, 478, 1835.
Recorded, Iredale, Pro. Mal. Soc., ix, 72, 1910.

Habitat.—Single valves occasionally washed up on the beaches at Sunday Island.

Distribution.—Lord Howe Island, Indo-Pacific region.

Saxicava artica (Linné).

Mya arctica Linné, Syst. Nat., ed. xii, 1113, 1767.
Recorded, Suter, Subantarctic Is. N.Z., i, 48, 1909.

Habitat.—Specimens taken from logs washed up on the beaches at Sunday Island.

Distribution.—New Zealand, Australia, cosmopolitan.

Gastrochaena retzii Deshayes.

Gastrochaena retzii Deshayes, Moll. de Réunion, 7, 1863.
Recorded, Iredale, Pro. Mal. Soc., ix, 72, 1910.

Habitat.—Dead shells found on the beaches, Sunday Island.

Distribution.—Indo-Pacific region.

Uperotis clava (Gmelin).

Teredo clava Gmelin, Syst. Nat., ed. xiii, 3748, 1791.

Habitat.—Colonies attached to coconuts found washed up on the beaches, Sunday Island.

Distribution.—Indo-Pacific region.

Nausitoria aurita Hedley.

Nausitoria aurita Hedley, Mem. Austr. Mus., iii, 507, 1899.

Habitat.—Plentiful in kauri (*Agathis australis*) logs washed up on the beaches at Sunday Island.

Distribution.—New Caledonia, Funafuti.

AMPHINEURA.

Lepidopleurus subtropicalis Iredale.

Lepidopleurus (*Terenochiton*) *subtropicalis* Iredale, Pro. Mal. Soc., xi, 28, 1914.
Recorded, Iredale, *l.c.*

Habitat.—Living on the underside of embedded dirty stones near low-water mark, Coral Bay, Sunday Island.

Parachiton mestayerae Iredale.

Parachiton mestayerae Iredale, Pro. Mal. Soc., xi, 27, 1914.
Recorded, Iredale, *l.c.*

Habitat.—Dredged on gravelly bottom near Sunday Island in 27 m. and 45 m. (Iredale); also living on underside of stones near low-water mark, Coral Bay.

Ischnochiton kermadecensis Iredale.

Ischnochiton kermadecensis Iredale, Pro. Mal. Soc., xi, 35, 1914.
Recorded, Iredale, *l.c.*

This species is closely allied to *I. intermedius* Hedley and Hull, from Norfolk Island. Iredale also describes a colour-variety under the name *exquisita*.

Habitat.—Abundant living on the underside of clean smooth stones near low-water mark, Sunday Island and Meyer Island.

Eudoxochiton perplexus Iredale.

Eudoxochiton perplexus Iredale, Pro. Mal. Soc., xi, 29, 1914.
Recorded, Iredale, *l.c.*

This species varies considerably in the angle of divergence of the median valves, and also slightly in the number of slits in the posterior valves. Using these characters, Iredale separated the Kermadec shells into two species; but as intermediate forms are the rule, and no satisfactory line can be drawn between the extreme forms, I consider the proper course is to treat them as one species. Utilizing the above characters, it is perhaps convenient to refer to Iredale's groups as varieties, which may be thus defined.

Var. *typica*.—Shell elevated, anterior and posterior valves each with about 23 slits.

Var. *imitator* (Iredale).—Shell depressed, anterior valve with more than 25 slits, posterior valve with about 22 slits.

Habitat.—Living on rocks about low-tide mark, Sunday and Meyer Islands. During the winter strong westerly winds caused the shifting of a good deal of sand on the north side of Sunday Island; this partly buried the lower portions of a rocky coast, and drove numbers of marine animals, including *Eudoxochiton* inshore, so that as many as sixteen of this species were captured in a single day.

Plaxiphora mixta Iredale.

Plaxiphora (*Maorichiton*) *mixta* Iredale, Pro. Mal. Soc., xi, 33, 1914.
Recorded, Iredale, *l.c.*

Habitat.—Living on rocks between tide-marks (fairly common), Sunday, Meyer, and Macauley Islands, and French Rock.

Rhyssoplax corypheus (Hedley and Hull).

Chiton corypheus Hedley and Hull, Pro. Linn. Soc. N.S.W., 37, 277, 1912.

Recorded, Iredale, Pro. Mal. Soc., xi, 41, 1914 (*Rhyssoplax exasperata*).

Here again I consider Iredale has overestimated the value of the distinguishing characters of the Kermadec Chitons. There is no good character by which the Norfolk and Sunday Island shells can be differentiated, but, recognizing the differences pointed out by Iredale, the Kermadec form may (as suggested by him) be ranked as a subspecies of *corypheus*, thus:—

Subsp. *exasperata* (Iredale).—Differs from the type in having the sulci weaker and less nodulous.

Habitat.—Living on the underside of clean smooth stones near low-tide mark, Sunday Island.

Distribution (of species).—Norfolk Island.

Sympharochiton themeropis Iredale.

Sympharochiton themeropis Iredale, Pro. Mal. Soc., xi, 43, 1914.
Recorded, Iredale, *l.c.*

Habitat.—Living in crevices of rocks between tide-marks, Meyer Island.

Onithochiton oliveri Iredale.

Onithochiton oliveri Iredale, Pro. Mal. Soc., xi, 46, 1914.
Recorded, Iredale, *l.c.*

Closely allied to *O. filholi* Roch, of New Zealand.

Habitat.—Living in crevices of rocks between tide-marks, Meyer Island; not common.

CEPHALOPODA.

Nautilus pompilius Linné.

Nautilus pompilius Linné, Syst. Nat., ed. x, 708, 1758.
Recorded, Iredale, Pro. Mal. Soc., ix, 72, 1910.

Habitat.—Broken shell washed up on beach, Sunday Island.
Distribution.—Australia, New Hebrides, Fiji, Polynesia.

Nautilus macromphalus Sowerby.

Nautilus macromphalus Sowb., Thes. Conch., 464, 1848.
Recorded, Iredale, Pro. Mal. Soc., ix, 72, 1910.

Habitat.—Broken shell washed up on beach, Sunday Island.
Distribution.—New Caledonia.

Spirula spirula (Linné).

Nautilus spirula Linné, Syst. Nat., ed. x, 710, 1758.
Recorded, Iredale, Pro. Mal. Soc., ix, 72, 1910.

Habitat.—Dead shells washed up on the beaches, Sunday Island, often in large numbers. Portions of the animal were also found.
Distribution.—Lord Howe Island, New Zealand, tropics generally.

Symplectoteuthis oualaniensis (Lesson).

Loligo oualaniensis Lesson, Voy. "Coquille," Zool., ii, 240, 1830.
Recorded, Berry, Trans. N.Z. Inst., 46, 148, 1914.

Habitat.—Rarely washed up on the beaches, Sunday Island
Distribution.—Australia, Indian and Pacific Oceans.

Sthenoteuthis bartramii (Lesueur).

Loligo bartramii Lesueur, Journ. Acad. Nat. Sci. Phila., ii, 90, 1821.
Recorded, Berry, Trans. N.Z. Inst., 46, 148, 1914.

Habitat.—Specimens occasionally washed up on the beaches, Sunday Island.
Distribution.—Atlantic Ocean.

Onychoteuthis banksii (Leach).

Loligo banksii Leach, Zool. Mis., iii, 141, 1817.
Recorded, Berry, Trans. N.Z. Inst., 46, 139, 1914.

Habitat.—Rarely washed up on the beaches, Sunday Island.
Distribution.—Lord Howe Island (Etheridge), cosmopolitan.

Abralia astrolineata Berry.

Abralia astrolineata Berry, Trans. N.Z. Inst., 46, 145, 1914.
Recorded, Berry, *l.c.*

Habitat.—One specimen washed up on beach, Sunday Island.

Abraliopsis hoylei (Pfeiffer).

Enoploteuthis hoylei Pfeiffer, Abh. Nat. Virens. Hamb., viii, 17, 1884.
Recorded, Berry, Trans. N.Z. Inst., 46, 148, 1914.

Habitat.—One young specimen found on the beach, Sunday Island.
Distribution.—Mascarene Islands, Pacific coast, middle America.

Nematolampas regalis Berry.

Nematolampas regalis Berry, Biol. Bull., xxv, 208, 1913.
Recorded, Berry, *l.c.*

Habitat.—Two specimens found on the beach, Sunday Island.

Cirroteuthis meangensis Hoyle.

Cirroteuthis meangensis Hoyle, Ann. Mag. Nat. Hist. (5), xv, 234, 1885.
Recorded, Hoyle, " Challenger " Rep., xvi, pt. 44, 104, 1886.

Habitat.—Dredged in 1,100 m. on hard ground north of Sunday Island (" Challenger " Expedition).
Distribution.—Meangis Islands (near Philippines).

Amphitretus pelagicus Hoyle.

Amphitretus pelagicus Hoyle, Ann. Mag. Nat. Hist. (5), xv, 235, 1885.
Recorded, Hoyle, *l.c.*

Habitat.—Dredged in 950 m. on volcanic mud between Sunday and Macauley Islands (" Challenger " Expedition).

Eledone verrucosa Verril.

Eledone verrucosa Verril, " Blake " Report, 105, 1881.
Recorded, Hoyle, " Challenger " Rep., xvi, pt. 44, 104, 1886.

Habitat.—Dredged in 1,150 m. on volcanic mud between Sunday and Macauley Islands (" Challenger " Expedition).
Distribution.—North Atlantic.

Pinnoctopus kermadecensis Berry.

Polypus (*Pinnoctopus ?*) *kermadecensis* Berry, Trans. N.Z. Inst., 46, 138, 1914.
Recorded, Berry, *l.c.*

Habitat.—One specimen found on beach, Sunday Island.

Polypus oliveri Berry.

Polypus oliveri Berry, Trans. N.Z. Inst., 46, 136, 1914.
Recorded, Berry, *l.c.*

Habitat.—Living among rocks between tide-marks, Sunday Island.

Argonauta argo Linné.

Argonauta argo Linné, Syst. Nat., ed. x, 708, 1758.
Recorded, Iredalè, Pro. Mal. Soc., ix, 72, 1910.

Habitat.—A few shells washed up on the beaches, Sunday Island.
Distribution.—New Zealand, Atlantic, Indian, and Pacific Oceans.

Argonauta nodosa Solander.

Argonauta nodosa Sol., Portl. Cat., 96, 1786.
Recorded, Iredale, Pro. Mal. Soc., ix, 72, 1910.

Habitat.—Both animals and shells occasionally washed up on the beaches, Sunday Island. The description by Berry of a female (Trans. N.Z. Inst., 46, 135) probably refers to this species. The largest shell collected at Sunday Island measured 17 cm. in length, and when cast ashore contained the animal.
Distribution.—New Zealand, Atlantic, Indian, and Pacific Oceans.

Geographical Relationships.

Continuous with the orographical axis of New Zealand a submarine ridge with a steep eastern slope falling to one of the profoundest troughs of the ocean extends in a direction about N. 22° E. as far as the Samoan Islands, though actually separated from the elevated area on which that group stands by a channel over 4,000 m. in depth. This ridge over the greater part of its length is less than 2,000 m., and is nowhere over 4,000 m., beneath the surface of the ocean. It is on this ridge, about midway between New Zealand and the Tongan Islands, that the Kermadec Group is situated. To the eastward is an unbroken expanse of ocean over 4,000 m. in depth; to the westward an area of ocean stretching to the Australian Continent, and whose bed is most irregular, the main features being two basins separated by a submarine ridge trending in a direction north-west from New Zealand towards New Caledonia. The Kermadec Group, therefore, appears to be situated on the eastern edge of a bygone complex continental area now for the most part submerged.

In order correctly to understand the geographical relationships and origin of a fauna it is necessary first to investigate the history of the region from a dynamical standpoint, for conclusions as to past changes in land surfaces based on considerations of faunal relationships must be revised if they conflict with results derived from geological evidence. In the case of the Kermadec Group I have elsewhere* described the structure of the various

* Trans. N.Z. Inst., vol. 43, p. 525, 1911.

islands, and outlined their probable history. Briefly, my conclusions are these: All the islands are of recent volcanic formation, two of them being still in the solfatara stage. Sunday Island is built on a base of which part is known to be composed of syenite, a rock usually associated with continental areas. The first eruptions were submarine, the later ones subaerial. Sunday Island has thus arisen from beneath the sea in recent geological times, and has not exceeded its present limits more than can be accounted for by marine and subaerial denudation. Whatever portion of the continental base was ever formerly above sea-level was entirely submerged before the present group of islands came into existence, and any terrestrial life it may have contained completely destroyed. Assuming that I have interpreted the geological evidence correctly, then the whole of the terrestrial life now found at the Kermadecs has arrived by accidental transoceanic migration; but among its marine forms one might expect to find an element suggestive of a continental connection.

Owing to the vast amount of work still to be done on the *Mollusca* it is not possible to speculate on their origin and relationships except by a statistical method. The relationships of the 261 species enumerated in the present paper may be expressed in tabular form thus:—

——	Total.	Per Cent.	Gastropoda.	Lamelli-branchia.	Amphineura.	Cephalopoda.
Endemic ..	89	34	70	7	8	4
Polynesian ..	108	42	89	19	..	..
New Zealand ..	31	12	22	9	..	..
Pelagic ..	33	12	21	..	..	12
	261	100	202	35	8	16

Endemic Element.

A third of the Kermadec molluscs are not known elsewhere. This proportion will probably be decreased when the molluscan fauna of the south-west Pacific is more closely studied. Taking first the *Gastropoda*, the bulk are probably of Polynesian affinities. Half the species are small shells, mostly under 5 mm. in length, most of them falling within the families *Rissoidae, Cerithiidae, Eulimidae,* and *Turritidae.* About one-fifth are fairly large shells, and these form a very remarkable collection of species which one might hardly expect on an isolated volcanic island. Possibly they indicate a former continental connection. Some of them appear to have no closely related species in the adjacent regions, though their affinities are mainly with the north (*Scutellastra kermadecensis, Tectus royanus, Conus kermadecensis, Cassidea royana, Spondylus raoulensis*). The highly variable members of the genera *Cellana* and *Siphonaria* were apparently derived from the south. The land shells are, according to Iredale, almost entirely of Polynesian origin.

Members of the class *Amphineura* appear to be particularly useful for indicating the routes of migration of marine faunas, especially as they are peculiarly sedentary in their habits, and, no doubt as a consequence, restricted in their distribution. The affinities of the Kermadec species are, as noted by Iredale, entirely with those of New Zealand. The presence of a variable member of the characteristic New Zealand genus *Eudoxochiton* is worthy of special notice.

Polynesian Element.

This is undoubtedly the largest element in the molluscan fauna of the Kermadecs. The figures given above include several species which I have in the literature at my disposal found recorded from Australia only; but most of them are tropical species, and no doubt extend to Polynesia as well. According to the table, over two-fifths of the Kermadec *Mollusca* are also found in Polynesia. But to estimate this element correctly there should be included all those endemic species of Polynesian affinities, and this would bring the proportion up to about two-thirds.

New Zealand Element.

Under this head I include one-eighth of the total number of molluscs known from the Kermadecs. Of these, twenty-three extend also to Australia, and, in addition, there are fifteen other New Zealand species distributed over the headings "Pelagic" and "Polynesian," thus making forty-six species common to the Kermadecs and New Zealand.

Pelagic Molluscs.

These are species which frequent the surface of the open ocean. They form about one-eighth of the total known molluscan fauna of the Kermadecs, a proportion which is evidently due to the situation of the group in a wide tract of ocean. Included are several Cephalopods and Pteropods, *Recluzia*, *Atlanta*, and four species of *Ianthina*, besides some species found in floating logs and coconuts.

Summary.

The *Mollusca* of the Kermadec Islands appear to be derived from two sources; that is, there appear to have been two main streams of migration —one, by far the larger, from Polynesia, and another from New Zealand. A highly peculiar group, typified by *Scutellastra kermadecensis*, may be taken as evidence of a first period of dispersal along a continental shore-line, but the bulk of the species, including all the terrestrial forms, indicate a later period synchronous with the existence of the present islands when no connection existed with other lands.

Ecology.

Although one of the most interesting branches of biological study, very little can be written under this head. A few remarks on the dependence of marine animals on the supply of water and food, quite obvious to the casual observer, interspersed among brief descriptions of the molluscan formations is all that I will attempt. These formations may conveniently be arranged, at least for my present purpose, in four series—namely, land, littoral rocks, sea-bottom, and surface of ocean. In abstracting the molluscan element in a formation, or, as I would prefer to call it, "biological community," one cannot get a correct view of the inter-relations of organisms, because the whole community really consists of every plant and animal living in and responding directly or indirectly—that is, through other plants or animals—to the same habitat. Defined by such considerations, two or more formations may be found in the same area. For instance, in the littoral belt, the group of organisms found living under stones is quite distinct from that found on their upper surfaces. The habitats are different, and few species are common to both.

Land Formations.

The numerous small animals and fungi living under stones and leaves in forest, and subsisting mainly on decaying vegetation, constitute a biological community distinct from but coterminous with the forest formation which gives rise to it. On Sunday Island eight small molluscs are found in this situation. On the trunks of trees eight other species are found; but this habitat is practically an extension of that on the ground, one species (*Helicarion kermadecensis*) being found in both. All the land molluscs found at Sunday Island are small, but this is, no doubt, due to the means of transportation available for them to reach the group—namely, on floating logs or other accidental means.

One land mollusc, *Assiminea nitida*, affected open rocks wetted by fresh water, which habitat was also shared by some crustaceans and cryptogamic plants.

Littoral Rock Formations.

Several communities of plants (algae) and animals are to be distinguished in the marine littoral belt. Certain ecological adaptations are easily observed when the whole belt is examined. For instance, the size of animals is found to increase from high-water mark downwards. In other words, the more water any station receives during the day, the greater the variety and abundance of life found therein; consequently, more food is available, and therefore larger animals are found. A second and more important though scarcely less obvious generalization is that the higher up above low-water mark an animal lives the more it is protected from desiccation by a calcareous shell or chitinous test. In the Kermadec Group rocks between tide-marks support a fauna and flora much poorer in species and individuals than the corresponding belt in New Zealand, and this I presume to be the result of its greater degree of insolation. In New Zealand I have observed that the line between the submerged and emerging belts is much more pronounced in the north than it is in the south.

Rock Belt.—Rocks about and above half-tide mark support no algae except crustaceous species, and in places small filamentous species, which, by harbouring mud, form a kind of slime. Molluscs, however, are fairly numerous. Near high-water mark are small species hiding in crevices of rocks, as *Melarhaphe unifasciata, Tectarius feejeensis, Siphonaria amphibia* —all able to live for more than half their time out of water. The *Siphonaria* by sticking close to the rock retains a drop of water, while *Tectarius* and *Melarhaphe* when withdrawn within their opercula are capable of living without water for days.

Lower down, where the rocks are exposed from about six to fifteen hours daily, are found plentifully *Cellana craticulatus, C. hedleyi, Siphonaria raoulensis, Neothais smithii, Plaxiphora mixta, Nerita melanotragus, Hinea brasilianus*, and less commonly *Pinclada vulgaris, Melina nucleus, Sympharochiton themeropis, Onithochiton oliveri*, and *Nerita plicata*—all able to conserve moisture by pressing close to the rock surface, or withdrawing within opercula or shelly valves.

Corallina Belt.—On rocks just above low-water mark considerable areas are covered by a dense growth, about 15 mm. tall, of the alga *Corallina officinalis*. This harbours, besides much sand and many worms, a large number of small bivalves of the species *Lasaea miliaris* and *Septifer bilocularis*.

Sargassum Belt.—The lowest tract of the emerging belt being exposed only at low spring tides, and constantly bathed by wave-action, is included in the belt of large brown algae extending to 1 m. or more below low-tide mark. This rocky belt, having a maximum quantity of light, supports a rich fauna and flora of a distinctly hydrophilous character. A number of large molluscs in no way protected against desiccation are found here. Such are *Polypus oliveri*, *Umbraculum umbella*, and many Aplysioids; to which should be added those molluscs which cannot draw into their shell behind an operculum, as *Conus kermadecensis*, *Siphonaria cheesemani*, and *Cypraea*. The large limpet *Scutellastra kermadecensis*, which must require a constant supply of food, is characteristic of this belt, in places almost covering the rocks. Its massive shell is rather a protection against predacious fishes than desiccation. Other large species found in this belt are *Charonia lampas*. *Argobuccinum australasia*, *Neothais succincta*, *Eudoxochiton perplexus*, and occasionally *Tectus royanus*. The dominant algae are *Sargassum fissifolium* and *Pterocladia capillacea*, the latter supporting in great abundance the small bivalve *Philobrya meleagrina*.

Under Stones.—With light absent or weak, and the presence of mud and sand, this habitat supports a distinctive fauna, composed of sponges, sea-anemones, worms, echinoderms, and molluscs. No algae were collected on the underside of rocks, except near the edges. The molluscs include four species of *Amphineura*, some small Gastropods (*Columbella versicolor*, *Gadinea conica*, *Vanikoro wallacei*, *Rissoina angasi*, *Clanculus atypicus*, and others), and the bivalves *Arca reticulata* and *Codakia bella*.

Sea-bottom.

Rocks near Shore.—In this belt, which extends from the *Sargassum* belt down for a few fathoms, the dominant fixed animals are corals and compound Ascidians. This is a difficult tract to investigate, as a dredge cannot be used. It is extremely rich in many kinds of animal life, and through a water-telescope presents a magnificent sight. *Tectus royanus* is abundant, while on coral *Magilus antiquus* and *Quoyula madreporarium* are plentiful. There can be little doubt that the large number of species of shells recorded in this paper as dredged on gravelly bottom and as found washed up on the beaches live among rocks below low-water mark.

Sand and Gravel.—A few live shells were dredged near Sunday Island on sand and gravel in 10 m. to 30 m. They include *Xenophora corrugata*, *Fusinus toreuma*, *Terebra circumcincta*, *Pecten medius*, *Protocardia pulchella*, and, attached to pumice, *Spondylus raoulensis*.

Surface of Ocean.

Plankton.—Situated in a vast expanse of ocean, Sunday Island, as might be supposed, frequently has cast up on its shore pelagic animals. Sometimes, as with *Ianthina*, *Spirula*, *Velella*, and *Physalia*, they are washed up in large numbers. Pelagic molluscs recorded in the present list include four species of *Ianthina*, *Recluzia lutea*, fourteen species of Pteropods, and several Cephalopods.

Floating Logs.—Besides numerous stalked cirripedes, crabs, and worms, there were found in logs cast up on the beaches *Saxicava arctica* and *Nausitoria aurita*, while *Uperotis clava* was taken from coconuts.

LITERATURE AND HISTORY.

1857. Pfeiffer, Dr. L. "Descriptions of Fifty-eight New Species of *Helicea* from the Collection of H. Cuming, Esq." Proc. Zool. Soc., 1856, p. 324. Describes two new species of land shells from Sunday Island, *Helix kermandeci* and *H. chimmoi*, collected by Lieut. Chimmo, presumably an officer of H.M.S. "Herald," which surveyed the island in 1854. *H. chimmoi* is omitted from the present list, as Iredale, who examined the type, is of opinion that the locality assigned to it is erroneous.

1873. Smith, E. A. "Description of a New Species belonging to the Genus *Vitrina*." Ann. Mag. Nat. Hist. (4), xi, p. 288. *V. kermadecensis* described from Sunday Island.

1873. Mousson. "Faune Malacologique de quelques Îles de l'Océan Pacifique Occidental, ii, Îles de Norfolk et de Kermandec." Journ. de Conch., xxi, p. 109. Records *Microcystis kermandeci* Pfeiffer, and describes as new *Vitrina ultima*, *Trochonanina exposita* and *Patula modicella* Férussac var. *vicinalis*. Of these, *V. ultima* is the same as *V. kermadecensis* Smith, while *P. modicella* var. *vicinalis* is omitted from the present list, as the type is lost and no specimens answering to Mousson's description have since been collected at Sunday Island. Mousson's specimens were collected by Dr. Graeffe.

1884. Hutton, F. W. "Revision of the Land *Mollusca* of New Zealand." Trans. N.Z. Inst., vol. 16, p. 186. *Vitrina kermadecensis* recorded from the Kermadecs, and also from Hobson's Glen, Auckland; but the latter locality is almost certainly an error.

1884–87. "Reports on the Scientific Results of the Voyage of H.M.S. 'Challenger.'" The "Challenger," on her famous voyage round the world, passed through the Kermadec Group on the 14th and 15th July, 1874. No landing was made on any of the islands, but the trawl was put over three times. Two casts were made between Sunday and Macauley Islands in 520 and 630 fathoms (Station 170), the bottom in both instances being volcanic mud. The following species of *Mollusca* were taken: *Spondylus ostreoides*, *Euplocamus pacificus*, *Amphitretus pelagicus*, *Eledone verrucosa*, and, on the surface, *Halopsyche gaudichaudi*. The trawl was again put over north of Sunday Island (Station 171) in 600 fathoms, bottom volcanic mud, the following *Mollusca* being obtained: *Pecten kermadecensis*, *Murex zelandicus*, *Cirroteuthis meangensis*. The above species were recorded in the undermentioned reports: *Nudibranchiata*, Dr. R. Bergh, vol. x, pt. 26, 1884; *Lamellibranchiata*, E. A. Smith, vol. xiii, pt. 35, 1885; *Gastropoda*, R. B. Watson, vol. xv, pt. 42, 1886; *Cephalopoda*, W. E. Hoyle, vol. xvi, pt. 44, 1886 (diagnoses of new species in Ann. Mag. Nat. Hist. (5), xv, 222); *Pteropoda*, Dr. P. Pelseneer, vol. xix, pt. 58, 1887.

1885–87. Tryon, G. W. "Manual of Conchology," 2nd series. Vol. i, 1885, p. 158, *Vitrina ultima*; vol. ii, 1886, p. 47, *Nanina exposita*; vol. iii, 1887, p. 38, *Helix modicella*.

1888. Cheeseman, T. F. "On the Flora of the Kermadec Islands, with Notes on the Fauna." Trans. N.Z. Inst., vol. 20, p. 151. Six species of marine Gastropods are recorded, while mention is made of a large limpet common on the rocks.

1893. Hedley, C., and Suter, H. "Reference List of the Land and Fresh-water *Mollusca* of New Zealand." Proc. Linn. Soc. N.S.W. (2), vii, p. 613. Recorded from the Kermadecs: *Helicarion ultimus*, *Microcystis kermadeci*, *Trochonanina exposita*, *Charopa modicella* var. *vicinalis*.

1894–95. Proc. Linn. Soc. N.S.W. The locality assigned to *Scutellastra kermadecensis* is disputed by Brazier (vol. ix, p. 18, 1894). Hedley then states that specimens were collected at Sunday Island by the crew of the New Zealand Government steamer "Hinemoa" (vol. ix, p. 465, 1895); but Brazier refuses to believe that this large limpet is found at Sunday Island, though he admits it occurs at Macauley Island (vol. ix, p. 566, 1895). The question is finally settled by Cheeseman, who states that he himself collected the type specimens at Sunday Island during his visit in the New Zealand Government steamer "Stella" in 1887 (vol. x, p. 221, 1895).

1899. Suter, H. "Malacological Communications from New Zealand" Journ. Malac., vol. viii, p. 54. *Scalaria australis* recorded from the Kermadecs.

1902. Suter, H. "On the Systematic Position of *Patella kermadecensis*, Pilsbry." Journ. Malac., vol. ix, p. 111. Branchial cordon and radula described and figured.

1905. Suter, H. "Revision of the New Zealand *Patellidae*, with Descriptions of a New Species and Subspecies." Proc. Mal. Soc., vol. vi, p. 346. *Helcioniscus craticulatus* is described from the Kermadecs.

1906. Suter, H. "Notes on New Zealand *Mollusca*, with Descriptions of New Species and Subspecies." Trans. N.Z. Inst, vol. 38, p. 316. Recorded from the Kermadecs: *Meleagrina radiata, Tutufa californica, Nassa zonalis, Purpura striata* var. *bollonsi, Terebra venosa*.

1907. Suter, H. "Notes and Additions to the New Zealand Molluscan Fauna." Trans. N.Z. Inst., vol. 39, p. 265. *Siphonaria diemenensis* recorded from the Kermadecs.

1909. Suter, H. "Descriptions of New Species and Subspecies of New Zealand *Mollusca*, with Notes on a Few Species." Proc. Mal. Soc., vol. viii, p. 254. Recorded from the Kermadecs: *Drupa bollonsi, Tornatellina subperforata*.

1909. Suter, H. "The *Mollusca* of the Subantarctic Islands of New Zealand." Subantarctic Is. N.Z., vol. 1, p. 1: Six species of marine molluscs recorded from the Kermadecs. Of these, I retain *Lemellaria ophione* and *Saxicava arctica*, but omit until authentic specimens are obtained *Cantharidus opalus, Trophon ambiguus, Chione stutchburyi*, and *C. yatei*.

1910. Iredale, T. "On Marine *Mollusca* from the Kermadec Islands and on the Sinusigera Apex." Proc. Mal. Soc., vol. ix, p. 68 (list of species reprinted in Proc. N.Z. Inst., 1910, p. 57). This is the first paper dealing with the *Mollusca* collected by the expedition to the Kermadec Islands in 1908, of which both Iredale and myself were members. Iredale records ninety-four species of *Gastropoda*, twenty-two of *Lamellibranchia*, and five of *Cephalopoda*. In the present list I have taken account of all of his species except *Erato corrugata* and *Rissoina polytropa*, as Iredale informs me that the shells so named belong to other species, as yet undetermined. Critical notes on several species of shells are given, together with a discussion on the sinusigera apex, which is recorded for several Kermadec species.

1910. Iredale, T. "Notes on *Polyplacophora*, chiefly Australian." Proc. Mal. Soc., vol. ix, p. 153. Contains an account of the Kermadec *Amphineura* collected in 1908, but none are assigned definitely to described species.

1911. Oliver, W. R. B. "The Geology of the Kermadec Islands." Trans. N.Z. Inst., vol. 43, p. 524. The following species are recorded from

the submarine volcanic tuffs of Sunday Island and outlying islets: *Turbo argyrostomus, Spondylus ostroides, Pecten kermadecensis, Arca decussata.* The correct names for these and others only generically identified at the time are given in the present list.

1911. Iredale, T. "On the Value of the Gastropod Apex in Classification." Proc. Mal. Soc., vol. ix, p. 319. A discussion on Gastropod apexes, mainly from Kermadec material, mentioning the following species: *Turris cingulifera, Planaxis brasilianus, Cerithiopsis sinon, Bullina scabra.*

1912. Iredale, T. "New Generic Names and New Species of Marine *Mollusca.*" Proc. Mal. Soc., vol. x, p. 217. Descriptions of thirteen new species of *Gastropoda* from the Kermadecs. Seven new generic names proposed for Kermadec Gastropods—*Roya, Royella, Brookula, Jeannea, Quoyula, Heterorissoa, Neothais.*

1913. Berry, S. S. "*Nematolampas,* a Remarkable New Cephalopod from the South Pacific." Biol. Bull., vol. 25, p. 208. Description and figure of *N. regalis,* collected at Sunday Island.

1913. Iredale, T. "The Land *Mollusca* of the Kermadec Islands." Proc. Mal. Soc., vol. x, p. 364. An account of the land shells collected at Sunday Island in 1908. There are seventeen species enumerated, of which eleven are described as new.

1913. Suter, H. "Manual of the New Zealand *Mollusca.*" In this work there are recorded from the Kermadec Islands thirty-three species of *Gastropoda* and nineteen of *Lamellibranchia.* Of these, thirty-two species were not taken by the expedition of 1908. There are no specimens in Mr. Suter's or any collection known to me, and Captain Bollons informs me he cannot remember collecting any of them. I have therefore omitted them in the present paper. They include the four species noted above (Subantarctic Is. N.Z., vol. i, 1909), and the following twenty-eight: *Haliotis virginea, Cantharidus purpuratus, Calliostoma pellucidum, Turritella carlottae, Struthiolaria papulosa, Natica zelandica, Epitonium zelebori, Cominella huttoni, C. maculosa, C. virgata, Murex octogonus, Trophon plebejus, Fulguraria arabica, Ancilla australis, Bathytoma cheesemani, Solemya parkinsoni, Nucula hartvigiana, Glycymeris laticostata, G. modesta, Venericardia australis, Divaricella cumingi, Tellina deltoidalis, Mesodesma subtriangulatum, Dosinia lambata, D. anus, Chione mesodesma, Soletellina nitida, Myodora striata.*

1914. Iredale, T. "The *Chiton* Fauna of the Kermadec Islands." Proc. Mal. Soc., vol. xi, p. 25. An account of the *Amphineura* collected at the Kermadecs in 1908. Nine species, all described as new. Fragments of four other species are generically determined only—*Acanthochites* (2), *Cryptoconchus, Lucilina.* An interesting comparison is made of the *Chiton* faunas of Lord Howe, Norfolk, and the Kermadec Islands.

1914. Berry, S. S. "Notes on a Collection of Cephalopods from the Kermadec Islands." Trans. N.Z. Inst., vol. 46, p. 134. An account of the Cephalopods collected in 1908 and subsequently. Three new species are described.

1914. Iredale, T. "Description of a New Species of *Cassidea.*" Proc. Mal. Soc., vol. xi, p. 179. *C. royana,* from Sunday Island.

1915. Iredale, T. "A Comparison of the Land Molluscan Faunas of the Kermadec Group and Norfolk Island." Trans. N.Z. Inst., vol. 47, p. 498, *ante.*

EXPLANATION OF PLATES.

Plate IX.

Figs. 1, 1*a*. *Cellana craticulatus* Suter subsp. *prolixus* n. subsp.
Figs. 2, 2*a*. *Cellana hedleyi* n. sp.
Figs. 3, 3*a*. *Cellana hedleyi* Oliver subsp. *corrugata* n. subsp.
Figs. 4, 4*a*. *Cellana vulcanicus* n. sp.
Figs. 5, 5*a*. *Cellana scopulinus* n. sp.
Figs. 6, 6*a*. *Schismope pacificus* n. sp.
Fig. 7. *Fissuridea bollonsi* n. sp.

Plate X.

Fig. 8. *Philorene texturata* n. sp.
Fig. 9. *Haurakia kermadecensis* n. sp.
Fig. 10. *Notosetia electra* n. sp.
Fig. 11. *Zebina cooperi* n. sp.
Fig. 12. *Issella chiltoni* n. sp.
Fig. 13. *Epigrus insularis* n. sp.
Fig. 14. *Epigrus gracilis* n. sp.
Fig. 15. *Cerostraca iredalei* n. sp.
Fig. 16. *Amphithalamus sundayensis* n. sp.
Fig. 17. *Sundaya exquisita* n. sp.
Fig. 18. *Caecum solitarium* n. sp.
Fig. 19. *Turbonilla oceanica* n. sp.
Fig. 20. *Turbonilla sculpturata* n. sp.
Fig. 21. *Miralda austro-pacifica* n. sp.
Fig. 22. *Hinemoa punicea* n. sp.
Fig. 23. *Pyrgulina insularis* n. sp.
Fig. 24. *Raoulostraca inexpectata* n. sp.
Fig. 24*a*. *Roaulostraca inexpectata* n. sp. Apex.
Fig. 25. *Melanella kermadecensis* n. sp.
Fig. 26. *Melanella perplexa* n. sp.
Fig. 27. *Subularia perspicua* n. sp.
Fig. 28. *Melanella spinosa* n. sp.

Plate XI.

Fig. 29. *Cithna wallacei* n. sp.
Fig. 30. *Scalenostoma suteri* n. sp.
Fig. 31. *Hexaplex puniceus* n. sp.
Fig. 32. *Mangilia hedleyi* n. sp.
Fig. 33. *Glyphostoma roseocincta* n. sp.
Fig. 34. *Iredalea subtropicalis* n. sp.
Fig. 35. *Kermia benhami* n. sp.
Fig. 36. *Mitramorpha expeditionis* n. sp.
Fig. 37. *Zafra kermadecensis* n. sp.
Fig. 38. *Zafra fuscolineata* n. sp.
Fig. 39. *Leuconopsis pacifica* n. sp.

Plate XII.

Figs. 40, 40*a*. *Siphonaria raoulensis* n. sp.
Figs. 41, 41*a*. *Siphonaria cheesemani* n. sp.
Figs. 42, 42*a*. *Siphonaria macauleyensis* n. sp.
Figs. 43, 43*a*. *Siphonaria macauleyensis* Oliver subsp. *perplexa* n. subsp.
Fig. 44. *Siphonaria amphibia* n. sp.
Fig. 45. *Pronucula kermadecensis* n. sp. Left valve.
Fig. 46. *Chlamys cellularis* n. sp.
Fig. 47. *Limatula insularis* n. sp. Left valve.
Figs. 48, 48*a*. *Spisula belliana* n. sp. Left valve.
Fig. 49. *Spondylus raoulensis* n. sp. Left valve.