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EDITED BY

WALTER E. COLLINGE, M.Sc.,

LECTURER ON ZOOLOGY AND COMPARATIVE ANATOMY IN THE UNIVERSITY OF BIRMINGHAM; PRESIDENT OF THE MIDLAND MALACOLOGICAL SOCIETY; AND PRESIDENT OF THE BIOLOGICAL SECTION OF THE BIRMINGHAM NATURAL HISTORY AND PHILOSOPHICAL SOCIETY.

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NOTES ON THERSITES (HADRA) BELLENDENKERENSIS, BRAZ., AND BEDDOMAE, BRAZ.

BY HUGH FULTON.

Having examined an authentic specimen of *beddomae*, *Braz.*, from the collection of the late Capt. C. E. Beddome, I have no hesitation in placing it as a variety of *bellendenkerensis*, *Braz.*, a species that is most variable in size and form. The variety *beddomae* is thinner, generally more depressed, and the minute zigzag sculpture is more distinct, being just discernable (on fresh specimens) without a lens.

The specimen mentioned above is of similar dimensions to the type, but two other specimens before me, one of which was collected together with *bellendenkerensis* in Queensland by Emil Weiske, the other being in Dr. Cox's collection and labelled *bellendenkerensis*, are more depressed, viz. :

maj. diam. 41 ; alt. 30. (Coll. Weiske).
" " 38 ; " 28. (Coll. Dr. Cox)

The original figure of *bellendenkerensis* in the Proc. Zool. Soc., 1875, t. 4, f. 4 and copied in Tryon's Manual, vol. vi, pl. 34, fig 1 does not agree with the dimensions given in the description, viz. : Alt. 17, greater diameter 12 lines (= Alt. 36, maj. diam. 45 millim.) whereas the figure measures, alt. 45, maj. diam. 44 millim.

Judging from specimens I have examined the figure is out of proportion, being much too high in proportion to its diameter.

A CRITICAL LIST OF THE SPHOEROSPIRA SECTION OF THERSITES.

By HUGH FULTON.

(Plate i.)

The collections of Dr. James C. Cox of Sydney, and of the late Capt. C. E Beddome, both rich in specimens of this group, having passed through my hands, I have had the opportunity of examining many typical specimens, and thought a critical list might be of some service.

One great difficulty in working out this group has hitherto been the lack of authentic material, so many of the species having been founded upon such slight characters, that without one had for comparison actual types or co-types, it was quite impossible to identify specimens with any certainty from descriptions. Fortunately, the collections mentioned above contained many co-types, especially of the forms described by John Brazier of Sydney, whose descriptions, often without figures, and very rarely with comparative notes, generally indicate but characters common to the whole group.

It is probably owing to lack of authentic material at his disposal, that Dr. H. A. Pilsbry's comparatively recent monograph in Tryon's Manual is not up to his usual excellent form; his division of the section into perforate and imperforate species is not a natural one, for example, *andersoni*, Cox, occurs both perforate and imperforate, and the same thing occurs in other species of the group.

In this list I have endeavoured to arrange the various forms according to their relationship and have added notes upon their distinguishing characters.

I am greatly indebted for valuable assistance to Col. Beddome, Dr. James C. Cox, Chas. Hedley, Esq., John Ponsonby, Esq., and Edgar A. Smith, Esq.

GROUP OF *incei*, Pfr.

1.—T. incei, Pfr.

P.Z.S., 1845, p. 126; Cox's Monog. Aust. L. Sh., pl. 5, fig. 5.
= *challisi*, Cox: P.Z.S., 1873, p. 565, pl. 48, fig. 3.
= *appendiculata*, Pfr.: P.Z.S., 1854, p. 149; Cox: Monog. Aust. L. Sh., pl. 5, fig. 11.
= *thatcheri*, Cox: P.Z.S., 1870, p. 170, pl. 16, fig. 2.
= *hanni*, Braz.: Proc. Linn. Soc. N.S.W. (i), 1876, p. 97.
= *hilli*, Braz.: P.Z.S., 1875, p. 32, pl. 4, fig. 3.
= *johnstonei*, Braz.: P.Z.S., 1875, p. 32, pl. 4, fig. 2.
= *bayensis*, Braz.: P.L.S., N.S.W. (i), 1872, p. 2.
= *praeterinissi*, Cox: Monog. Aust. L. Sh., p. 111, pl. 20, fig. 13.
Loc.—Queensland.

Types of *incei* and *appendiculata* in British Museum

Compared with the type of *incei*, typical *appendiculata* is a little flatter in form, *thatcheri* a little broader, *hilli* smaller and more conical; *johnstonei* same form as *hilli*, but larger; *bayensis* is simply a thicker form of *appendiculata*, *praetermissi* is the lighter coloured variety with no circum-umbilical brown patch, but that character is not constant

I have not seen a speciman of *chattisi*, but judging from the description and figure, it is evidently almost identical with typical *incei*.

The foregoing comparisons are made from typical specimens, but they are closely linked together by intermediate forms, proving that they belong to one species.

Pilsbry, in Tryon's Manual of the Mollusca, vol. vi, p. 167, had evidently not a typical specimen of *incei* before him, but rather one of the varieties, as he distinguishes it by the absence of the brown circum-umbilical patch, a character that is present in the type specimen of *incei*.

T. incei v. **yepponensis**, C. E. Beddome.

Proc. Linn. Soc. N.S.W., 1897, vol. xxii, p. 123 figd.

Loc—Yeppon, near Rockhampton, Queensland.

A lighter-coloured shell, and with the umbilicus more excavately open than in typical *incei*.

2—T. lessoni, Pfr.

Pfr. Sym., 1846, iii, p. 71; Reeve: Con. Icon., fig. 754.

= *seminigra*, Morelet: Journ. de Conchyl., 1864, p. 289.

= *parsoni*, Cox: P.Z.S., 1872, p. 18, pl. 4, fig. 2.

Loc.—Queensland.

Types in British Museum.

The types of *lessoni* and *parsoni* represent the extremes of this species, the former being very small and somewhat depressed, whereas the latter is larger and rather higher in the spire than usual. Although *lessoni*, by reason of its dark brown colour, white peristome, and absence of spiral bands on the lower whorls, is readily separable from *incei*; yet it agrees so closely in other respects, that I am doubtful as to whether it can be anything more than a colour variety of that species. The earlier whorls are lighter in colour and the middle ones have generally two or three narrow spiral bands.

T. lessoni v. **aureedensis**, Brazier.

P.Z.S., 1871, p. 640; Tryon's Man. of Conch., vol. viii, p. 282, pl. 54, figs 7-9.

Loc—Yeppon, near Rockhampton, Queensland.

Type in Australian Museum.

Very similar above to *lessoni* in form and coloration, but slightly flatter below and with a broad light-yellowish circum-umbilical patch; the triangular dilated portion of the peristome at the point of insertion is white, whereas in *lessoni* it is of a brownish colour.

T. lessoni v. **lutea**, n. var.

Pl. 1, fig. 4.

Loc.—N. Queensland.

Same form as *lessoni* v. *aureolensis*, but of a light-yellowish colour. Of three specimens before me one is entirely bandless, but the other two have the narrow light-brown spiral bands on earlier whorls, the same as one finds on most specimens of *aureolensis*.

3.—T. curtisiana, Pfr.

P.Z.S., 1863, p. 528.

= *bala*, Braz.: Proc. Linn. Soc. N.S.W. (iii), 1878, p. 78, pl. 8, fig. 4.

Loc.—Townsville and Magnetic Is., Queensland.

Somewhat like *lessoni* in form and coloration, but the whorls increase rather more rapidly in size, it has half a whorl less, the aperture is not quite so broad, the peristome is less dilated at the point of insertion and of a light reddish-brown colour, not white as in *lessoni*.

4.—T. andersoni, Cox.

P.Z.S., 1871, p. 644, pl. 52, fig. 4.

Loc.—Rockhampton, Queensland.

Type in British Museum.

This species is most variable in size: of the twenty before me the following are the dimensions of four specimens:—

Alt. 15, maj. diam. 27 millim.
Alt. 18, „ „ 26 „
Alt. 21, „ „ 33 „
Alt. 26, „ „ 30 „

Some specimens are quite imperforate, but more commonly it is more or less perforate.

Pilsbry in Tryon's Manual, vol. vi, p. 172, pl. 39, figs. 82 and 83, describes and figures perforate specimens of this species as *yulei*, but gives a figure of the true *yulei* on plate 23, figures 65 and 66.

Andersoni can be separated from *incei* by its thinner substance, its less oblique, less expanded, and, brown peristome, it is also less openly umbilicated and has half a whorl less,

From *yulei* it can be distinguished by its lighter coloration and narrower bands above, its narrower umbilicus and much less expanded peristome.

5.—T. yulei, Forbes.

Appendix Voy. "Rattlesnake," 1852, p. 377, pl. 2, fig. 6.

= *rainbirdi*, Cox: P.Z.S., 1870, p. 170, pl. 16, fig. 1.

Loc.—Queensland.

Types in British Museum.

The types of *yulei* and *rainbirdi* are extreme forms, the type of *yulei* being a small light-coloured, and depressed form, whilst the type of *rainbirdi* is large, globose, and darker-coloured; the very large series before me closely connects these two forms.

The broadly-expanded, dark-brown peristome and excavated umbilicus, differentiates this form from its allies.

GROUP OF *fraseri*.

6.—T. frazeri, Gray.

Zool. Beechey's Voy. Moll., 1839, p. 143, pl. 38, fig. 6.

= *mossmani*, Braz.: P.Z.S., 1875, p. 33, pl. 4, fig. 6.

Loc.—New South Wales and Queensland.

This species varies greatly in size and coloration; a specimen before me is of a light yellowish-brown with only one colour band, situated at the suture of the lower whorls; another has an additional one at the periphery of the last whorl, whilst others are nearly covered with dark brown spiral bands. The colour of the peristome varies from black to a light bluish-grey.

Some of the larger forms approach *informis*, Mouss., but the latter can be readily separated by its higher spire and more rapidly increasing whorls.

The shell described as *mossmani* is a rather globose form of *fraseri* with a black peristome: the original figure is misleading, being much higher in proportion to width, according to the dimensions given in the description.

T. frazeri v. **flavescens,** Hedley.

I have not seen this remarkable variety said to be "of a uniform light yellow, lip pure white."

Loc.—Corumbui Creek, Queensland.

7.—T. rawnesleyi, Cox.

P.Z.S., 1873, p. 564, pl. 48, fig. 2.

Loc.—Mt. Elliott, Queensland.

A heavy form of a uniform dark brown with a thick and broadly expanded peristome.

T. rawnesleyi v. **mazee,** Braz.

Proc. Linn. Soc. N.S.W., 1878 (iii), p. 70, pl. 8, fig. 5.

Loc.—Rockingham Bay, Queensland.

From typical *rawnesleyi* this differs chiefly in coloration, having numerous dark-brown spiral bands upon a light yellowish-brown ground: it varies greatly in size and resembles *fraseri*, but can be separated by the thicker peristome and smaller aperture.

All the *fraseri* group have the microscopic waved striation, although it is almost obsolete in some specimens.

In *fraseri* there are generally on the middle whorls more or less conspicuous (under a strong lens) microscopic spiral impressed lines, which I have not seen on specimens of *mazee*.

8.—T. rockhamptonensis, Cox.

P.Z.S., 1873, p. 150.

= *moreshyi,* Angas: P.Z.S., 1876, p. 767, pl. 20, figs. 8, 9.

Loc.—Rockhampton, Port Denison, Queensland.

A solid form somewhat similar to *rawnesleyi* var. *mazee* in coloration but readily distinguished by its *flat base* and its thinner and darker coloured peristome.

Moreshyi was described from an elevated specimen of *rockhamptonensis.*

T. rockhamptonensis v. **pallida,** Hedley & Musson.

Proc. Linn. Soc. N.S.W., 1891, p. 556.

Loc.—Rockhampton, Queensland.

I have not seen this shell, which is described as "handless, of a tawny yellow colour." I thought my *lessoni* v. *lutea* was this variety and sent a specimen of that to Mr. Hedley, but he writes "your shell is quite different, the type specimen of *pallida* is an odd shell, I have seen none like it and now doubt if it is not an abnormal individual."

GROUP OF *whartoni.*

9.—T. bebias, Brazier.

Proc. Linn. Soc. N.S.W. (iii), 1878, p. 78.

Loc.—Garden Is., Rockingham Bay, Queensland.

Almost identical with *whartoni* in general appearance, but the umbilicus is less open, some specimens being quite imperforate; may or may not have a circum-umbilical brown patch. The chief distinction between this and *whartoni* is the difference in the microscopic sculpture, the latter consists of closely-set, silk-like, slightly waved striae, whereas in *bebias* it is coarser and more granular.

10.—T. zebina, Brazier.

Proc. Linn. Soc. N.S.W., 1878, p. 78, pl. 8, fig. 2.

Loc.—Douglas River, Queensland

Type in Australian Museum, Sydney.

Very close to *bebias* but thicker, more globose, and its microscopic granulated sculpture is more conspicuous. It is said by Brazier to be imperforate, but I have a slightly perforate specimen before me.

11.—T. whartoni, Cox.

P.Z.S., 1871, p. 55, pl. 3, figs. 5, 5a.

= *mouritzana,* Braz.: P.Z.S., 1895, p. 31, pl. 4, fig. 1.

Loc.—Port Denison, Queensland.

Type in British Museum.

A thin multi-banded shell approaching some of the varieties of *mulgravensis,* but distinguished by its microscopical sculpture, which consists of oblique, closely-set, slightly waved, almost straight striae; this sculpture is seen (under the lens) to be quite distinct from that of *bebias* and its allies.

12.—T. cookensis, Brazier.

Proc. Linn. Soc. N.S.W. (i), 1875, p. 17.

– *tomsoni*, Braz. : P.L.S.N.S.W. (i) 1876, p. 97.

– *cookensis*, Braz. : Tryon's Man. of Conch., vol. vi., p. 97.

Loc.—Gould Is., Rockingham Bay, and Frazer's Is., Queensland (not Cooktown, *fide* Brazier).

This has the same microscopic sculpture as *lebias*, but is smaller, darker-coloured, the aperture not quite as broad and slightly less oblique. The shell is of a somewhat thicker substance, and the colour bands do not show clearly through the aperture as in *lebias*, the interior being almost opaque whitish ; the peristome of *cookensis* is also thicker and darker in colour.

13.—T. mulgravensis, Brazier.

Pl. 1, fig. 1.

P.Z.S., 1872, p. 21.

= *mulgravei*, Braz. : Proc. Roy. Soc. Queensland, 1889, p. 101.

Loc.—Palm Is., N.E. Australia.

With regard to this species, figured here for the first time, there must, I think, have been some error in the dimensions given, viz., alt. 1 in. 1 line ; greater diam. 2 in. 4 lines. (Alt. 27 ; diam. 58 millim). A shell of these dimensions would be a most remarkable form for this group. A specimen from the collection of the late Capt. C. E. Beddome of Tasmania, who had many shells named by Brazier, measuring alt. 32 ; maj. diam. (including peristome) 34 millim., answers better to Brazier's description, "turbinately globose."

Since writing the above Mr. Charles Hedley has been kind enough to measure the type specimen in the Australian Museum and gives the following dimensions : alt. 30 ; maj. diam. 38 millim.

I have only seen one specimen.

T. mulgravensis v. **palmensis,** Brazier.

Pl. 1, fig. 5, 6.

Proc. Linn. Soc. N.S.W. (i), 1876, p. 105.

Loc.—Palm Is., Queensland.

An extremely variable form, the typical specimens being solid and globose conic whilst others are depressed and of thin substance, resembling *hartoni*. The microscopic sculpture is the same as that of *lebias*, but *palmensis* is larger, has the umbilicus more open and is further distinguished by its uniformly coloured peristome (which may be dark or whitish) the colour-bands not extending to the edge as in *lebias*.

T. mulgravensis v. **meridionalis,** Brazier.

Pl. 1, fig. 7, 8.

Proc. Linn. Soc. N.S.W. (i), 1880, vol. 5, p. 458.

Loc.—Palm Is., Queensland.

Described from a young specimen, adult specimens being thicker, and the peristome lighter in colour.

This uniform yellowish variety with a narrow sutural dark-brown band, occurs also with a narrow band, at the periphery of last whorl.

GROUP OF *blomfieldi*, Cox.

14.—T. informis, Mouss.

Journ. de Conchyl., 1869, p. 59, pl. 4, fig. 3.

Loc.—Port Mackay, Queensland.

The largest species of the group (see note under *frazeri*). A bandless variety occurs of a uniform dark drown with a narrow yellowish subsutural border.

15.—T. blomfieldi, Cox.

Catal. Aust. L. Sh., 1864, p. 19; Monog. Aust. L. Sh., 1868, pl. 1, fig. 1.

= v. *warroensis*, Hed. & Musson: Proc. Linn. Soc. N.S.W. 1891, p. 556, Viag. Magenta, pl. 2, fig. 5.

Loc.—Port Curtis, Queensland.

A distinct species, readily distinguished by its light-coloured earlier whorls, contrasting with the very dark-brown lower ones. Under a strong lens the lower whorls are seen to have more or less obsolete, numerous spiral impressed lines.

The variety *warroensis* is the lighter-brown variety, but specimens before me show various degrees between that and the darker typical colour.

16.—T. concors, n. sp.

Pl. 1, fig. 3.

= *parsoni*, Pils. (not Cox): Tryon's Man. of Conch., vol. vi., p. 162, pl. 35, figs. 11, 12 (not 13).

Shell sub-globose, solid, narrowly but deeply umbilicated, light-coloured above, with two narrow indistinct light-brown spiral bands on the middle whorls, last whorl of a very dark-brown, with a narrow conspicuous yellowish band at the suture; whorls 4½, last descending in front. Aperture very oblique, rather dark within. Peristome moderately expanded, dark brown, triangularly dilated at point of insertion and partly covering the umbilicus.

Maj. diam. 35; alt 28 millim.

Loc.—Gayndah, Queensland.

This species is very like *blomfieldi* in coloration, but more compressed in form, the umbilicus is more open, and the peristome not so broadly expanded.

It is quite distinct from *curtisiana*, Pfr., although bearing a superficial resemblance to that species.

17.—T. croftoni, Cox.

P.Z.S., 1872, p. 18, pl. 4, fig. 1.

Loc.—Hydrometer River, Queensland.

Type in British Museum.

18.—T. coxi, Crosse.

Journ. de Conchyl., 1866, p. 195; Conchyl. Cab., p. 534, pl. 163, figs. 5, 6.

Loc.—Port Molle and Port Denison, Queensland.

Although always easily separated, almost the only difference between *croftoni* and *coxi* is that of coloration.

GROUP OF *macleayi*.

19.—T. oconnellensis, Cox.

P.Z.S., 1871, p. 55, pl. 3, figs. 4, 4a.

Loc.—The O'Connell River, Port Denison, Queensland.

Type in British Museum.

A distinct form easily distinguished by its basal flatness (the spire varies greatly in height) and broadly excavated umbilical area.

20.—T. arthuriana, Cox.

P.Z.S., 1873, p. 564, pl. 41, figs. 1, 1a.

Loc.—L. Is., N. Queensland.

Nearest to the foregoing species, but lighter-coloured above, the last whorl is more rounded and the umbilicus not nearly so broadly excavated.

21.—T. gratiosa, Cox.

P.Z.S., 1871, p. 53, pl. 3, figs. 1, 1a.

Loc.—Whitsunday Is., Queensland.

Type in British Museum.

A distinct form, easily recognised.

22.—T. etheridgei, Brazier.

Pl. 1, fig. 2.

Proc. Linn. Soc. N.S.W. (ii), 1877, p. 25.

Loc.—Andromache River, N.E. Coast of Australia.

Type in Col. Beddome's collection.

Differs from *gratiosa* in having a white peristome and numerous yellowish spiral bands on lower part of the last whorl. It is probably only a variety of *gratiosa*. I have only seen two examples.

23.—T. macleayi, Cox.

P.Z.S., 1864, p. 485, figs. 1—3.

Loc.—Whitsunday Is., and Port Denison, Queensland.

Somewhat similar to *gratiosa* in form, but readily separated by its very different coloration.

GROUP OF *greenhilli*.

24.—T. greenhilli, Cox.

Journ de Conchyl., 1865, p. 46, : Monog. Aust. L. Sh., p. 40, pl. 9, fig. 1 and pl. 18, fig. 8.

Loc.—Upper Denison River, Queensland.

Closely allied to *sardalabiata*, from which it differs in being generally thinner, of a rounder form, darker in colour, and readily separated by its conspicuous (under the lens) microscopical granular sculpture.

Pilsbry, in Tryon's Manual of Conchology, places this under *Badistes*.

25.—T. sardalabiata, Cox.

P.Z.S., 1871, p. 54, pl. 3, fig. 3.

Loc.—Mt. Dryander, Port Denison, Queensland.

Type in British Museum.

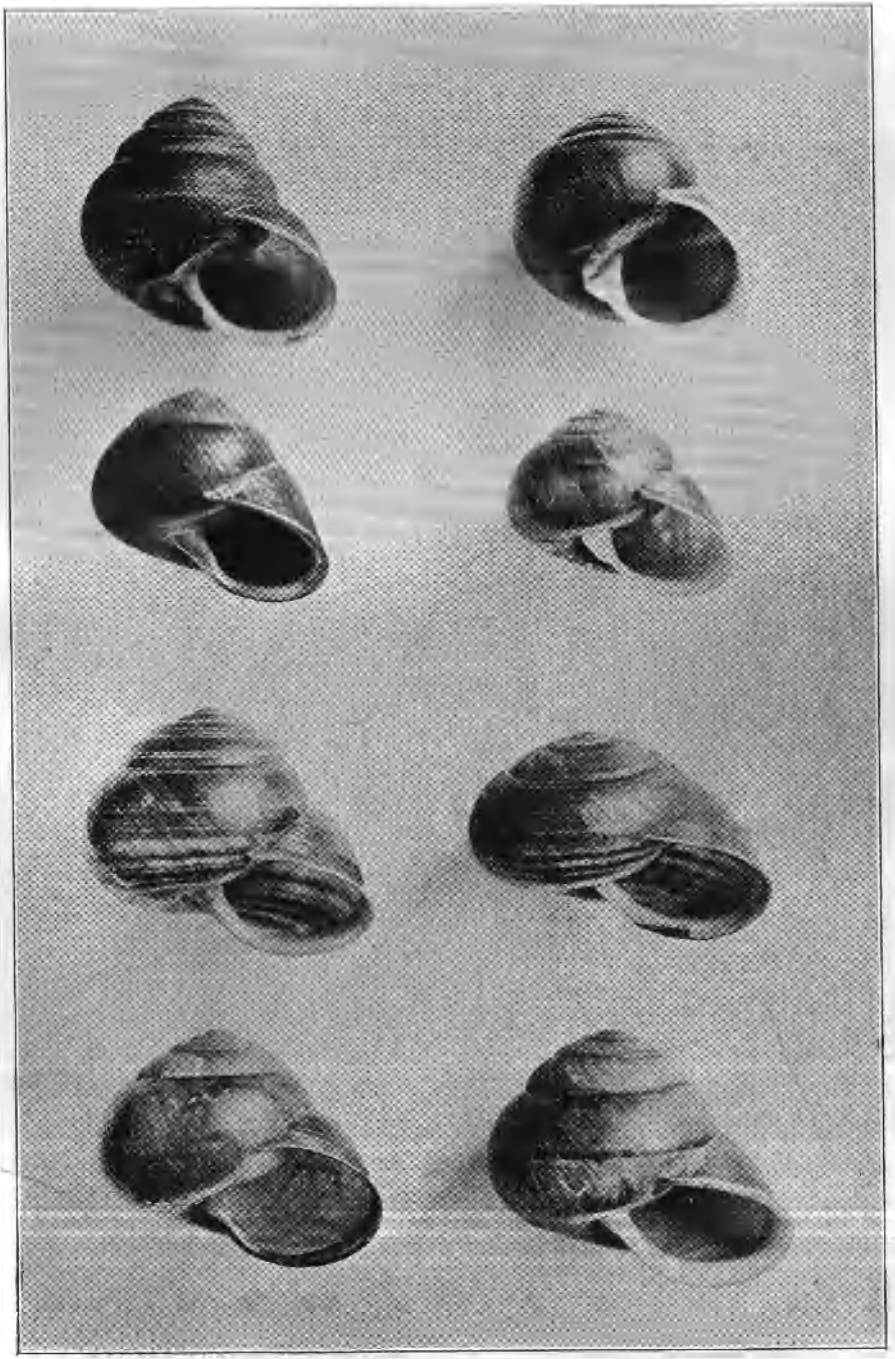
A light straw-coloured shell allied to *greenhilli*.

POSITION DOUBTFUL.

rearetata, Fer, Hist. Moll., pl. 101, figs. 6, 7.

Species placed under *Sphoerospira* by Pilsbry in Tryon's Manual of Conchology, but belonging to other sections.

barnayi, Cox. *(Hadra ?).*
baldomae, Brazier. *(Hadra).*
bellendenkerensis, Brazier. *(Hadra).*
broadbenti, Brazier. *(Sulcobasis ?).*
creedi, Cox. (Section ?).
hixoni, Brazier. *(Papuina).*
mitchellae, Cox. *(Thersites).*
nicomede, Brazier. *(Hadra).*
wesselensis, Cox. *(Rhayada).*



SPECIES AND VARIETIES OF THERSITES.

EXPLANATION OF PLATE I.

Fig. 1. *Thersites mulgravensis*, Brazier.
2. ,, *etheridgei*, Brazier.
3. ,, *concors*, n. sp.
4. ,, *bessoni*, Pfr. var. *lutea*, n. var.
5. ,, *mulgravensis*, Brazier var. *palmensis*, Braz. Typical form.
6. ,, *mulgravensis*, Brazier var. *palmensis*. Braz. Depressed form.
7. ,, *mulgravensis*, Brazier var. *meridionalis*, Braz.
8. ,, *mulgravensis*, Brazier var. *meridionalis*, Braz. Banded.

The position of the figures are as under:

1	2
3	4
5	6
7	8

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NOTES ON THE ANATOMY OF THE GENERATIVE ORGANS OF ARIOPHANTA JULIANA, GRAY.

By H. OVERTON,

Sutton Coldfield, Warwick.

The specimens which have furnished the following account are some that were collected by the late Mr. Oliver Collett at Galle, Ceylon.

The position of this species in the genus *Ariophanta*, I do not, at present, propose to discuss; like many other members of the genus far too little is known of its internal structure, in fact there is a striking absence of any thorough and detailed statement of the anatomical characters of this genus. Semper (Reisen Arch. Philip. 1870) has given short descriptions of certain organs in different species, and Lieut.-Col. Godwin-Austen has still more briefly referred to the generative organs of various species, but his remarks together with the indistinct nature of the drawings illustrating them, are almost useless for purposes of comparison, indeed, it is difficult to attach any serious value to them whatever.

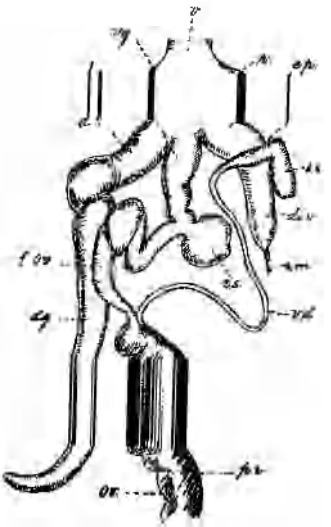

Fig. 1.—Generative Organs, as seen when separated from the external generative orifice.

Reference Letters.—*div.* Diverticulum of penis. *d.g.* Dart gland. *d.s.* Dart-sac. *e.p.* Epiphallus. *f.ov.* Free-oviduct. *k.s.* Kalk-sac. *ov.* Oviduct. *p.* Penis. *pr.* Prostate. *r.m.* Retractor muscle. *r.s.* Receptaculum seminis. *v.* Vestibule. *v.d.* Vas deferens. *v.g.* Vagina.

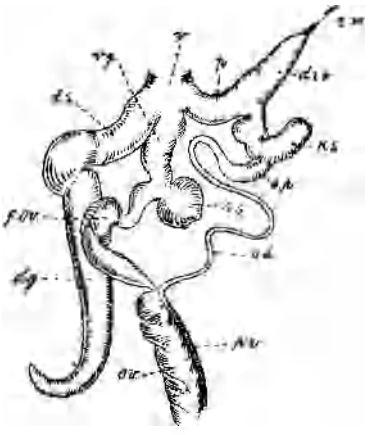

Fig. 2.—Generative Organs, with the penis, etc., turned on one side. Lettering as in Fig. 1.

Externally the generative orifice opens into the vestibule into which the penis opens posteriorly and dorsally, the dart-sac anteriorly and ventrally, and the vagina in the middle.

The vagina is a moderately long tube-like duct, having its internal wall thrown into four longitudinal plications, which are continued into the free-oviduct. At the opening of the receptaculum seminis they form a series of serpentine folds, beyond which they run in a straight series for a short distance, and then in the bulbous portion of the free oviduct they become more numerous and rise up in a very prominent manner. The receptaculum seminis is a heart-shaped sac, and sessile. The penis is a large muscular organ with a thick-walled muscular diverticulum, at the apex of which is the retractor muscle. At the junction of the penis and diverticulum the kalk-sac is given off. This sac is a large muscular body, with smooth internal walls, and in one specimen contained a hard calcareous body measuring 2 by 1 millim., which in all probability was a spermatophore incompletely formed. From the anterior end of this sac the epiphallus is given off, which leads to the narrow vas deferens. The dart-sac is a large muscular tube, and contains a small fleshy dart, which exhibits a concentric ribbing.

Judging from the generative organs this species seems to be nearer to *Euplecta*, Semper, than to *Ariophanta*, s.s.

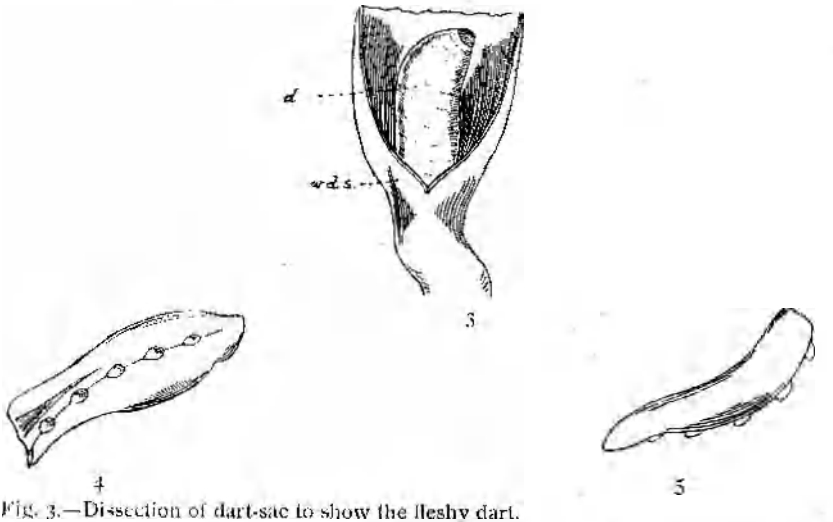

Fig. 3.—Dissection of dart-sac to show the fleshy dart.
Figs. 4 and 5.—Dorsal and lateral views of incompletely formed spermatophore.
REFERENCE LETTERS.—*d.* Dart. *w.d.s.* Wall of dart-sac.

NOTES ON SLUGS AND SLUG-LIKE MOLLUSCS.*

BY WALTER E. COLLINGE, M.Sc.

5.—On a new and interesting genus of Slugs.

Some short time ago I received from Professor Plate of Berlin, a very interesting collection of slugs, numbering upwards of a hundred specimens, mostly belonging to the genus *Veronicella*, Blainville. Amongst these are three slugs, which at first sight I thought belonged to the genus *Atopos*, Simr., but on opening the bottle in which they were contained with some specimens of *Veronicella*, it was at once evident that I had before me a slug which could not be referred to any known genus. Unfortunately Dr. Plate does not know where the specimens were collected; there is one large example and two much smaller specimens.

Externally the large specimen, which measures 75 millim., in length, looks somewhat like a unicoloured *Atopos*; it is a dirty sepia-brown in colour, very slightly keeled posteriorly, the tail end attenuated and the foot-sole extending a little beyond the dorsum. On the sides of the dorsum are a series of seven or eight obliquely directed grooves, rising from the perinotum, and as these pass in a backward direction on the sides of the dorsum they divide in a dendritic manner into finer grooves. The generative orifice is situated on the right side, close to the foot-sole and 44 millim. from the posterior end of the body. The teeth of the radula are as in *Veronicella*.

* See ante, 1901, vol. x. p. 27.

6.—Arion subfuscus from the Orkney Isles.

I am indebted to the kindness of Dr. Geo. E. Allan, for a peculiar specimen of *Arion subfuscus*, Drap., collected by him in the Orkney Isles during the summer of 1903.

Externally the specimen is much darker in colour than those usually met with, and the foot-sole and foot-fringe are a light-brown, the former without lineoles.

Internally the chief differences from the normal condition are confined to the generative organs. The typical appearance is so well-known that I need not here describe it, beyond pointing out the very characteristic form which the free-oviduct exhibits in this species. In the specimen under consideration instead of the J-shaped free-oviduct, and the gradually tapering sperm duct, the former was thrown into a series of saccular dilatations and nearly twice as long as usual, while the sperm duct was a fine wavy tube of almost equal dimensions throughout.

I have elsewhere (1) described and figured the variations met with in the generative organs of this species, in some hundreds of specimens dissected during 1892—1895, and these were exceedingly few. This is the first I have met with since, and quite distinct from any previously described.

7.—Absence of the Male Generative Organs in Arion hortensis, Fer.

It may be of interest to record that recently when opening a specimen of this mollusc collected in the south of England, I was somewhat surprised to find the whole of the male portion of the generative organs absent. As in other cases recorded for different species of this genus, the sperm duct, vas deferens, receptaculum seminis and duct, and the prostatic canal, were all wanting.

PROCEEDINGS OF THE MIDLAND MALACOLOGICAL SOCIETY.

47TH MEETING, NOVEMBER 13TH, 1903.

The President in the chair.

EXHIBITS.

By Mr. Guy Breeden: Series of shells of different species of *Limnaea* from various localities.

By Mr. Collinge: A drawer from the Hunter-Barron Collection containing British species of *Limnaea*.

48TH (ANNUAL) MEETING, DECEMBER 11TH, 1903.

The President in the chair.

The Annual Report of the Council and the Treasurer's statement were read and adopted.

In the absence of any amendments to the Council's nominations, the following

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(1) Proc. Zool. Soc., 1897, p. 443, pl. xxix, figs. 1—5.

Council and officers were delared elected for 1904.

President—Walter E. Collinge, M.Sc.

Vice-President—E. R. Sykes, B.A., F.L.S.

Treasurer—H. H. Bloomer.

Secretary—H. Overton.

Librarian and Curator—Guy Breeden.

Council—Guy Breeden, H. Willoughby Ellis, F.E.S., H. McClelland, and Bromley Peebles.

EXHIBITS.

By Mr. McClelland: A small collection of South African marine shells.

49TH MEETING, JANUARY 15TH, 1904.

The President in the chair, who delivered his Presidential Address, entitled "Some neglected branches of Malacology."

50TH MEETING, MARCH 11TH, 1904.

The President in the chair.

The Secretary announced and laid upon the table a number of additions to the Library.

EXHIBITS.

On behalf of Mr. McClelland: A very small, but full grown specimen of *Helix nemoralis*.

By Messrs. Collinge, Breeden and Overton: Collections of the British species of *Pisidium* from various localities.

CURRENT LITERATURE.

Pilsbry, Henry A.—Manual of Conchology, ser. ii, vol. xvi (pt. 62) pp. 65—128, pls. 19-31, (pt. 63), pp. 129—192, pls. 1—15, (pl. 64), pp. 193—329, (pt. 64a), pp. i—xl, pls. 16—37. Philadelphia: Academy of Natural Sciences.

Continuing the genus *Brachypodella*, the author describes the Jamaican species, the sub-genera *Simplicervix*, Pilsbry, *Mychostoma*, Albers, with *B. diminuta*, n. sp., *B. alba* (C. B. Ad.), vars. *cos*, *minima*, *strinta*, and *occidentalis*, nov., and *Aponia*, Beck.

Turning next to the genus *Pineria*, Poey (Type *P. beathiana*, Poey), the four known species are reviewed.

The genus *Macroceramus*, Guilding, which follows next, stands apart from all other genera of *Urocoptinae*. Anatomically it has not yet been described. The genus is represented in Haiti by three groups of species: the groups of *M. tenuiplicatus*, of *M. klatteanus*, and of *M. lineatus*. In the latter group *M. signatus* var. *salleanus*, *M. richaudi*, vars. *lineatistrigatus* and *sublineatus* are new, as also *M. gabbi* from Santo Domingo. In the group of *M. tenuiplicatus* the var. *swiftianus* of that species is new, and in the *M. klatteanus* group *M. sub-cylindricus* is a new species. The East and Central Cuban species follow.

The next genus *Microceramus*, Pils. and Van., is also undescribed anatomically. The following are described as new: *M. gossei* (Pfr.), var. *providentia*, and *M. pelicianus* (Orb.), var. *perconicus*.

The *Megaspiridae*, Pils., are next commenced. The author remarks that the members of this family seem to have been differentiated from their allies, the *Clausiliidae*, in the Northern Hemisphere of the Old World, during Mesozoic time. *Eomegaspira* represents a branch which attained high specialisation at the dawn of the Eocene in Western Europe, and shortly thereafter became extinct, either in consequence of over-specialisation, or as a result of physical changes in the unstable geography of this area. The ancestors of *Perrieria* and *Coelocion* made their way south-eastward to Papua and Australia, while the Brazilian *Megaspira* traces its forebears over the mid-Atlantic, like the *Streptaxidae*, *Ampullariidae*, of the same region, from tropical Africa, whence they migrated to South America over the Cretaceous land-bridge supposed to have spanned the Atlantic.

The following genera are reviewed, *Callionepion*, Pils. and Van., *Megaspira*, "Lea," Jay, *Eomegaspira*, Pils., and *Perrieria*, Tap. Can.

An Index to the *Urocoptidae* and *Megaspiridae* follow, and the author then passes on to the *Achatinidae*.

In this last mentioned family the following genera are treated of: *Pseudachatina*, Albers, with *P. pyramidata*, Kob. v. *kobelliana*, n. var., *P. daillyana*, n.sp., from West Africa; *Afopocochlis*, Cr. & Fisch.; *Pseudotrochus*, H. & A. Ad., with *P. morelletianus* (Desh.) v. *pallidior*, n. var.: *Perideriopsis*, Putz.; *Limicolaria*, Schum., with *L. tryoniana*, *L. agathina*, *L. lucalana*, and *L. felina*, Shuttl. v. *zebra*, all new and from West Africa; *L. flammata* (Caill.) v. *smithi* and *L. longa*, both new from East Africa; *Burtoa*, Bourg., and *Metachatina*, Pils.

The supplementary part (64a) is an exceedingly interesting one, and is entirely devoted to the *Urocoptidae*.

Commencing with a definition of the family, the author passes at once to the general morphology. The general structure of the pallial organs is rather that of the *Bulimulidae* than of the *Clausiliidae*. The generative organs have been examined in a few species of *Eucalodium*, *Coelocentrum*, *Berendtia*, *Anisospira*, *Epirobia*, *Holospira*, *Urocoptis*, and *Brachypodella*. In the first six genera they are characterised by a usually very short, thick penis, with a long epiphallus, the retractor muscle is inserted on the diaphragm, and the receptaculum seminis has a long duct arising not very high on the vagina. In the two remaining genera, the penis is longer, the epiphallus apparently obsolete, and the receptacular duct arises higher. The alimentary canal is long and varies considerably in the different genera, the pharynx or buccal mass, however, is always short, as in the *Helicidae*. The jaw and radula are subject to much variation. Respecting the free retractor muscles, in *Eucalodium* the pharyngeal and left retractors branch from the root of the columellar, and then the ocular, which is thus united for a short distance with the columellar. Anteriorly the two oculars unite to form a muscular plate over the pharynx. In *Coelocentrum* the left ocular and pharyngeal retractor are united for a third of their length, and the pharyngeal retractor gives off a band to each anteriorly. In *Holospira* the left ocular is united part way with the pharyngeal and the right with the columellar muscles. In *Urocoptis brevis* the muscles arise as in *Eucalodium*, but are independent distally, and the right ocular functions also as a penial retractor. Finally in *Brachypodella chemnitziana* the pharyngeal and ocular retractors are united for a third of their length, and the columellar runs free of them. From the morphological right retractor a group of fibres arise which pass to the vas deferens and vagina.

The form, colouration, sculpture, and axis of the shell are next dealt with, followed by a consideration of the significant characters and evolution of the family. It is pointed out that many genera are in the stage termed phylogerontic by Hyatt. They are in the old age of the race, and Dr. Pilsbry believes that many phyla will not outlast the present geological period. Evidences of decadence are seen in the specialisation of the radula, the decreasing growth-power indicated by the fusiform shape of

the shell, and the laxity of coil, while the structure of the axis indicates that many phyla have passed their acme of specialisation, and are on the decline.

Parallel and convergent evolution is well illustrated by certain shell characters, and comparisons are instituted between the shells of the different genera. The geological and zoogeographical data bearing on the family are next reviewed, together with historical notes on the classification and that adopted in the present work. Finally an analytical key to genera completes this valuable and interesting work.

We have long wished to see the biological side of each family dealt with, and it is by no means an easy task the author has had to deal with. The work has been well done, as one would expect from an expert of such great ability, indeed no higher praise can be given to volume xvi than to say it is worthy of the reputation of its author.

In conclusion we must regret, with all malacologists who appreciate this magnificent monograph, the exceedingly careless manner in which the different parts of this volume are stitched. There is no reasonable excuse for stitching nearly three-eights of an inch into the pages and plates of any work.

Hedley, Charles.—Scientific Results of the Trawling Expedition of H.M.C.S. "Thetis." Mollusca, Part II. *Mem. Aus. Mus., 1903, vol. iv, pt. 6, pp. 327—402, pls. xxxvi—xxxviii, and 53 figs. in text.*

The second part of Mr. Hedley's paper treats of the Scaphopoda and Gastropoda, and records 4 species of the former, of which 2 are new, and 161 of the latter, 35 of which are new.

Epigrus (Type *Rissoa ischnus*, Tate) is a new genus allied to *Scrobs*, Watson, and *Myxa* (*M. exesa*, n. sp.) is a new genus of the *Pyramellidae*, umbilicate, with few whorls, no columella fold, and the lip produced anteriorly. A new genus of the *Buccinidae* related to *Hindsia* is described under the name of *Fascinus* (Type *F. typicus*, n. sp.). In several points it recalls *Colubraria*, but lacks the varices on the upper whorls, in other *Nassa*, but the pattern of the sculpture is foreign to that genus, while the large apex and absence of columella plications separate it from *Hindsia*.

We note with some disappointment, the absence of anatomical details for any of the new genera or species.

Melvill, J. Cosmo and Ponsonby, J. H.—Descriptions of Thirty-one Terrestrial and Fluviatile Mollusca from South Africa. Ann. Mag. Nat. Hist., 1903 (8. 7.), vol. xii, pp. 595—609, pls. xxxi, xxxii.

This the seventeeth contribution towards the elucidation of the non-marine Molluscan fauna of South Africa, includes descriptions of eleven species of *Ennea*, eight of *Trachycystis*, two of *Ancylus*, and one each of ten other genera.

Trachycystis scolopendra is an interesting species, and perhaps the most remarkable South African Helicoid yet described. *Fauxulus crawfordianus* is a particularly fine and interesting dextral species, with six unusually complicated peristomatal processes. A very handsome species of *Tropidophora*, and a *Chondrocyclus* may also be mentioned.

Eliot, C.—On some Nudibranchs from East Africa and Zanzibar. Part II. Proc. Zool. Soc. Lond., 1903, pp. 250—257.

The author describes two new genera and five new species, none of which, however, are figured.

Ceratophyllidia africana, gen. et. sp. nov., is described from a single specimen, possessing a buccal aparatus similar to that of *Phyllidiopsis*, with the back studded with papillae. *Pleurophyllidiella horalii*, gen. et sp. nov., is also described from a single specimen and appears to be intermediate between *Pleurolaura* and *Pleurophyllidia*. The remaining new species are—*Baeolidia major*, *Cerberilla africana*, and *Ercolania zanzibarica*.

Dall, W. H.—Contributions to the Tertiary Fauna of Florida. Pt. vi. Trans. Wagner Free Inst. Sci. Philad., 1903, vol. iii, pp. xiv, 1219—1654 pls. xlviii—lx.

We heartily congratulate Dr. Dall on the completion of his great work. The first part was issued in 1890, and further parts have been issued from time to time, the sixth completing this invaluable monograph. In all the work comprises upwards of seventeen hundred printed pages and sixty beautiful plates containing over eleven hundred figures.

In the present part the author continues his review of the *Teleodesmacea*, following with the *Anomalodesmacea*, and describes many new species in both orders. The Brachiopoda are next treated of, and finally a most interesting and valuable "Discussion of the Geology" is given.

Dall, W. H. and Bartsch, P.—Synopsis of the Genera, Sub-genera and Sections of the family Pyramidellidae. Proc. Biol. Soc. Washington, 1904, vol. xvii, pp. 1—6.

The authors recognise four genera, viz., *Pyramidella*, Lam., *Turbonilla*, Risso, *Odostomia*, Flem., and *Murchisonella*, Morch. The first genus is then divided into 24 sub-genera and sections of which the following are new: *Milda*, (Type *Obeliscus centricosus*, Quoy), *Voluspa* (Type *Pyramidella auricoma*, Dall), *Callolongchaeus* (Type *P. jamaicensis*, Dall), *Ulfa* (Type *P. (Ulfa) cossmanni*, nom. nov. = *Syrnola striata*, Cossm.), *Tropaeas* (Type *P. subulata*, A. Ads.), *Vagna* (Type *P. pannotensis*, Tryon), *Cossmannica* (Type *P. clandestina*, Desh.), *Orinella*, nom. nov. (Type *Orina pinguicula*, A. Ads.), *Sulcorinella* (Type *P. (S.) dodona*, n. sp.), *Iphiana* (Type *Syrnola densistriata*, Garrett), and *Syrnolina* (Type *Syrnola rubra*, Pse.).

The second genus is divided into 21 sub-genera and sections the following being new: *Saccoina*, nom. nov. (Type *Spica monterosator*, Sacco), *Visma* (Type *Eulimella tenuis*, Sby.), *Lancella*, nom. nov. (Type *Turbonilla (Lancea) elongata*, Pse.), *Asmunda* (Type *Chemnitzia turrita*, C. B. Ad.) and *Baldra* (Type *Turbonilla (B.) archeri*, n.sp.).

The genus *Odostomia* contains 40 sub-genera, the following 10 being new: *Villia* (Type *O. (V.) pilsbryi*, n.sp.), *Folinella* (Type *Amoura angulifera*, De Fol.), *Besla* (Type *Chrysallida convexa*, Cpr.), *Egila* (Type *C. lacunata*, Cpr.), *Haldra* (Type *C. photis*, Cpr.), *Iridia* (Type *Parthenia armata*, Cpr.), *Evalina* (Type *O. (E.) americana*, n.sp.), *Slonega* (Type *O. cinspicua, Ald.*) *Heida* (Type *Syrnola calvosaensis*, Dall), and *Lysacme* (Type *Chrysallida clausiliformis*, Cpr.).

Kennard, A. S. and Woodward, B. B.—Holocene Deposits at Clifton Hampden, near Oxford. Proc. Cotteswold Nat. Field Club, 1903, vol. xiv, pp. 191—203.

The authors record 54 species of land and freshwater shells from three beds on the banks of the Thames at Clifton Hampden, of which 15 are land and 39 freshwater forms. As the authors remark it is not often that in these recent deposits any marked super-position of beds occurs, hence the importance of the present section, in which Bed A. yielded 30, Bed B. 49, and Bed C. 26 species.

Knight, G. A. F.—A Visit to the Outer Hebrides in search of Mollusca. Trans. Perthshire Soc. Nat. Sci. 1903, vol. iii, pp. 193—217.

Mr. Knight gives an interesting account of a holiday spent in the Outer Hebrides in search of Mollusca. He records 71 species and 9 varieties of marine mollusca, 8 species and 1 variety of land, and 1 species and variety of freshwater.

Collinge, Walter E.—Report on the Non-operculate Land Mollusca. Fasciculi Malayenses, Zoology, 1904, vol. i, pp. 205—218, pl. xi—xiii.

The author describes the collection made by Messrs. Annandale and Robinson during 1901—2 in the Malay Peninsula.

A new species of *Damayantia* is described and one of *Parmarion*, also one of the genus *Hoplos*.

After examining the anatomy of the *Helicarion loei* of de Morgan, Mr. Collinge is of opinion that it can not be retained in that genus. It is closely related to certain species of *Ariophanta*, and he suggests that it should be placed in the genus *Nilgirta*.

The variety *martensi* of *Hemiplecta salangana* is also new, as well as the variety *globosus*, Fulton, of *Amphidromus perakensis*, *Fult.*

McIntosh, Prof.—The Story of a Pearl. Zool., 1904 (s. 4), vol. viii, pp. 41—56, pl. 1.

Professor McIntosh gives interesting account of the views of the earlier writers on pearl formation, as well as those of recent times.

Lebour, Marie V.—Additions to the List of Marine Mollusca of Northumberland. Report Northumberland Sea Fish. Comm., 1903, p. 50.

The authoress adds to her previous lists, *Limapontia nigra*, Johnst., *Goniodoris nodosa*, (Mont.), *Doris bilamellata*, L., and *Trochus helicinus*, Fabr.

Thiele, Joh.—Anatomisch-systematische Untersuchungen einiger Gastropoden. Wiss. Ergeb. deutschen Tiefsee-Exped. a. d. Dampfer "Valdivia" 1898—1899, 1903, Bd. vii, pp. 149—174, Tfn. vi—ix.

Bavay, A. and Dautzenberg, Ph.—Description de coquilles nouvelles de l'Indo-Chine. Journ. de Conchyl. 1903, vol. li, pp. 201—236, pls. vii—xi.

The authors in this their third contribution to the mollusca of the Indo-China region, describe and figure numerous new species and varieties, amongst those we may number as especially interesting: *Streptaxis (Odontartemon) mabilli*, *Sitala acutecarinata*, *Boysidia messageri and gereti*, *and Helicomorpha scalaroides*. In addition to the new species, figures are also given of some hitherto unfigured.

EDITOR'S NOTES.

The Editor again appeals to those subscribers whose subscriptions are one, two or three years in arrear to kindly forward the same. Unless these subscriptions are paid during the present year, the question of the continued publication of the Journal will have to be seriously considered.

We note with much pleasure the election of our editorial colleague, Mr. E. R. Sykes, to the Presidency of the Malacological Society of London.

THE

JOURNAL OF MALACOLOGY.

No. 2. JULY 11TH, 1904. VOL. XI.

ON A COLLECTION OF MARINE SHELLS FROM PORT ALFRED, CAPE COLONY.

BY EDGAR A. SMITH, I.S.O.,

British Museum (Natural History) London.

(Plates ii, iii.)

IN the early part of last year the British Museum received from Lieut.-Col. W. H. Turton, R.E., a large series of shells collected by him at Port Alfred, Cape Colony. The collection is of interest, as it contains a considerable number of new forms and also a few others which are new to the known fauna of South Africa. It also shows how rich in species this particular locality evidently is. It has been thought useful and interesting to give a list of the species as all were obtained at one place and within the short period of two or three months. Besides the species enumerated, there are numerous specimens which, being beach rolled, (the whole collection having been obtained on the shore), are beyond recognition. Others are too young to be dealt with and a few belong to families, *Vermetidae*, *Ostraeidae*, etc., which are extremely difficult to determine. Probably altogether about fifty species are comprised in this unnamed material which are not included in the following list, and Colonel Turton writes that he has upon a second visit to Port Alfred found a considerable number of species which were not in his first collection. It is not therefore improbable that some four hundred and fifty species will eventually be recorded from this one locality.

All the species about to be enumerated, excepting those new to the fauna,[1] are quoted and references given, either in Sowerby's "Marine Shells of South Africa," or in my paper in the Proc. Malacol. Soc., vol. v, pp. 354—402.

1. Marked in the list with an asterisk.

A. List of Species.

Spirula peroni, Lamk.
Melampus acinoides, Morelet.
Gadinia costata, Krauss.
*Ampullarina africana, n.sp.
Siphonaria concinna, Sowb.
Siphonaria capensis, Q. & G. var.
Siphonaria aspera, Krauss.
Bulla ampulla, Linn.
Hydatina physis, Linn.
Haminea natalensis, Krauss.
Cylichna cylindracea, Pennant.
Tornatina voluta, Q. & G.
Actaeon albus, Sowb.
Retusa truncatula, Brug
Terebra capensis, Smith.
*Terebra suspensa, n.sp.
Conus infrenatus, Reeve.
Conus pictus, Reeve.
Conus bairstowi, Sowb.
Conus tinianus, Hwass.
Clionella kraussi, Smith.
Clionella bipartita, Smith.
Clionella subventricosa, Smith.
Clionella rosaria, Reeve.
Clionella sinuata, Born. var.
Clionella (?) platystoma, Smith.
Clavatula gravis, Hinds.
Pleurotoma fultoni, Sowb.
Drillia rousi, Sowb.
Drillia caffra, Smith
Drillia layardi, Sowb.
Drillia diversa, Smith
Drillia bairstowi, Sowb.
Drillia hottentota, Smith.
*Drillia albonodulosa, n.sp.
*Drillia thetis, n.sp.
*Drillia nivosa, n.sp.
*Drillia subcontracta, n.sp.
*Drillia praetermissa, n.sp.
Clathurella capensis, Smith.
Clathurella ponsonbyi, Sowb.
Clathurella grayi, Reeve.
*Clathurella crassilirata, n.sp.
Clathurella verrucosa, Sowb.
Mangilia septangularis, Mont.
Mangilia amplexa, Gld.
*Mangilia alfredi, n.sp.
Daphnella (?) sulcata, Sowb.
Daphnella capensis, Sowb.
(= Columbella capensis.)
*Glyphostoma siren, n.sp.
Mitromorpha volva, Sowb.
Alcira elegans, H. Ad.
Columbella lightfooti, Smith.
Columbella pyramidalis, Sowb.
Columbella algoensis, Sowb.
Columbella albuginosa, Rve.
Columbella cerealis, Menke.
*Columbella adjacens, n sp.
Cancellaria semidisjuncta, Sowb.
Cancellaria foveolata, Sowb.
Ancilla obtusa, Swainson.
*Ancilla reevei, n.sp.
Ancilla obesa, Sowb.
Ancilla fasciata, Rve.
Ancilla albozonata, n.sp.
(= A. cinnamomea, Sowb. non Lamk.)
Ancilla marmorata, Rve.
Marginella ornata, Redfield.
Marginella mosaica, Sowb.
Marginella piperita, Hinds.
Marginella bairstowi, Sowb.
Marginella albocincta, Sowb.
Marginella punctilineata, Smith, var.
Marginella neglecta, Sowb.
Marginella zonata, Kiener.
Marginella keenii, Marratt.
*Marginella pura, n.sp.
Marginella pellicula, Marratt?
Marginella burnupi, Sowb.
*Marginella differens, n.sp.
Marginella cylindrica, Sowb.
Marginella algoensis, Smith.
Marginella fallax, Smith.

*Marginella corusca, Reeve.
*Marginella dulcis, n.sp.
*Marginella munda, n.sp.
*Marginella pseutes, n.sp.
Voluta africana, Rve.
Mitra picta, Rve.
Mitra latruncularia, Rve.
Mitra patula, Rve.
Mitra merula, Sowb.
Mitra capensis, Dkr.
Mitra canaliculata, Sowb.
Mitra euzonata, Sowb.
Mitra bathyraphe, Sowb.
Mitra kowiensis, Sowb.
Fasciolaria heynemanni, Dkr
Latirus rousi, Sowb.
Latirus bairstowi, Sowb.
Fusus ocelliferus, Bory, var. robustior, Sowb.
*Fusus cingulatus, n.sp.
Melapium lineatum, Lamk.
Cominella lagenaria, Lamk
Cominella tigrina, Kiener.
Cominella porcata, Gmelin.
Cominella elongata, Dkr.
Cominella unifasciata, Sowb
Cominella puncturata, Sowb.
Cominella capensis, Dkr.
Cominella angusta, Sowb.
Tritonidea insculpta, Sowb.
Euthria fuscotincta, Sowb.
Sylvanocochlea ancilla, Hanley.
Eburna papillaris, Sowb.
Nassa crawfordi, Sowb.
Nassa pulchella, A. Ad.
Nassa poecilosticta, n sp.
(= N. coccinea (A. Ad.), Sowb.)
Nassa pyramidalis, A. Ad.
Nassa speciosa, A. Ad.
Nassa serotina, A. Ad. var.
Nassa kraussiana, Dkr.
Nassa (Demoulia) abbreviata, Gmel.
Nassa retusa, Lamk.
Bullia callosa, Wood.
*Bullia trifasciata, n.sp.
Bullia laevissima, Gmel.
Bullia tenuis, Rve.
Bullia annulata, Lamk.
Bullia rhodostoma, Gray.
Bullia semiusta, Rve.
Bullia diluta, Krauss.
Bullia pura, Melvill.
Murex uncinarius, Lamk.
Murex scrobiculatus, Dkr.
Murex babingtoni, Sowb.
Murex kieneri, Rve.
Murex crawfordi, Sowb.
Trophon insignis, Sowb.
Purpura capensis, Petit.
*Purpura texturata, n.sp.
Purpura squamosa, Lamk.
Purpura cataracta, Chemn.
Purpura castanea, Kuster.
(Syn. Cominella unifasciata, Sowb.)
Latiaxis rosaceus, Smith.
Coralliophila rubrococcinea, Melv. & Standen.
Lotorium sauliae, Rve.
Lotorium africanum, A. Ad.
Lotorium leucostoma, Lamk. var.
Lotorium doliarium, Lamk.
Lotorium kienei, Sowb.
Lotorium olearium, Desh.
Lotorium argus, Lamk.
Ranella granifera, Lamk.
Ranella anceps, Lamk.
Cassis achatina, Lamk.
Dolium dunkeri, Hanley.
Radius aurantia, Sowb. ?
Cypraea citrina, Gray, var.
Cypraea edentula, Sowb.
Cypraea minoridens, Melvill.
Cypraeovula capensis, Gray.
Trivia oniscus, Lamk.
Trivia vesicularis, Gaskoin.
Trivia formosa, Gaskoin.
Trivia oryza, Lamk.
Cerithium pingue, A. Ad.

*Cerithiopsis trilineata, Phil.
Cerithiopsis exquisita, Sowb.
Cerithiopsis foveolata, Sowb.
Trifora perversa, Linn.
*Trifora convexa, n.sp.
*Trifora fuscomaculata, n.sp.
Trifora cingulata, A. Ad.
*Trifora fuscescens, n.sp.
Turritella carinifera, Lamk
Littorina knysnaensis, Phil.
Littorina africana, Phil
Diala dubia, Sowb
Diala pinnae, Krauss, var?
Assiminea bifasciata, Nevill.
Assiminea umlaasiana, Smith.
*Rissoina alfredi, n.sp.
Rissoina elegantula, Angas.
Rissoa fenestrata, Krauss.
*Rissoa perspecta, n.sp.
Rissoa argentea, Sowb.
*Rissoa conspecta, n.sp.
Rissoa (Cingula) caffra, Sowb.
Torinia dorsuosa, Hinds
Torinia variegata, Gmelin.
Crepidula (Crypta) aculeata, Gmelin.
Crepidula (Crypta) adspersa, Dkr.
Crepidula (Trochita) helicoidea, Sowb.
Crepidula (Mitrella) chinensis, Linn.
Natica imperforata, Gray.
Natica forata, Rve.
*Natica decipiens, n.sp.
*Natica napus, n.sp.
Natica didyma, Bolten.
Ianthina globosa, Swains.
Ianthina communis, Lamk.
Ianthina exigua, Lamk.
Scala aculeata, Sowb. var.
Scala coronata, Lamk.
Scala fragilis, Hanley?
Scala lactea, Krauss.
*Acrilla gracilis, H. Ad.
Syrnola capensis, Sowb.
*Mormula rissoina, A. Ad.
*Turbonilla hofmani, Angas.
Turbonilla tincta, Sowb.
Turbonilla laevicostata, Sowb.
Turbonilla tegulata, Sowb.
*Turbonilla gemmula, n.sp.
Turbonilla bathyraphe, Sowb.
*Turbonilla decora, n.sp.
Cingulina circinata, A. Ad.
Odostomia robusta, Sowb. var.
Odostomia lavertinae, Smith.
Odostomia (Ondina) lucida, Sowb.
Miralda crispa, Sowb.
Graphis pellucida, Sowb.
Eulima distorta, Desh.
*Eulima distincta, n.sp.
Eulima dilecta, Smith.
Eulima langleyi, Sowb.
Eulima simplex, Sowb.
*Eulimella nivea, n.sp.
*Eulimella minor, n.sp.
Niso balteata, Sowb.
*Niso interrupta, Sowb.
Astralium taylorianum, Smith.
Turbo (Orana) cidaris, var. natalensis.
Turbo (Samarticus) sarmaticus, Linn.
Leptothyra sanguinea, Linn.
*Leptothyra armillata, A. Ad.
Phasianella elongata, Krauss.
Phasianella kochi, Phil.
Phasianella bicarinata, Dkr.
Phasianella capensis, Dkr.
Clanculus miniatus, Anton.
Calliostoma bicingulatum, Lamk.
Gibbula tryoni, Pilsbry.
Gibbula multicolor, Krauss.
Gibbula benzi, Krauss.
Gibbula fucata, Gld.
Gibbula cicer, Menke.
Oxystele impervia, Menke.
Oxystele tabularis, Krauss.
Oxystele tigrina, Chemn.
Oxystele merula, Chemn.
*Cynisca forticostata, n.sp.
Cyclostrema planulata, Sowb.
*Ethalia africana, n.sp.

Haliotis sanguinea, Hanley.
Haliotis midae, Linn.
Pupillia aperta, Sowb.
Fissurellidaea hiantula, Lamk.
Fissurellidaea concatenata, Cr. & Fisch.
Fissurella natalensis, Krauss.
Glyphis elizabethae, Smith
Glyphis calyculata, Sowb.
Glyphis spreta, Smith.
Glyphis elevata, Dkr.
Patella variabilis, Krauss.
Patella rustica, Linn.?
Patella umbella, Gmelin.
Patella granularis, Linn.
Patella argenvillei, Krauss?
Patella plicata, Born.
Patella longicosta, Lamk.
Patella oculus, Born.
Patella (Olana) cochlear, Gmelin.
Patella (Patina) pruinosa, Krauss.
Helcion pectinata Linn.
Chiton tulipa. Q. & G.
Callochiton castaneus, Wood.
Dinoplax gigas, Gmelin.
Acanthochites garnoti, Blainville.
Dentalium belcheri, Sowb.
Lima rotundata, Sowb.
*Lima perfecta, n.sp.
Pecten tinctus, Reeve.
Margaritifera capensis, Sowb.
Mytilus (Chloromya) perna, Linn.
Mytilus (Aulacomya) variabilis, var?
*Modiola tenerrima, n.sp.
Modiola petagnae, Scacchi. var?
Modiola lignea, Reeve.
Modiolaria coenobita, Vaillant.
Arca lactea, Linn.
Arca obliquata, Wood.
Glycimeris queketti, Sowb. jun.?
*Limopsis pumilio, n.sp.
*Hochstetteria velaini, n.sp.
*Hochstetteria limoides, n sp.
Thecalia concamerata, Brug.
Carditella rugosa, Sowb.
*Carditella laticostata, n.sp.
Neocardia angulata, Sowb.
Cardita elata, Sowb.
*Cardita minima, n.sp.
Crassatella acuminata, Sowb.
Cardium turtoni, Sowb.
Cardium natalense, Sowb
Dosinia hepatica, Lamk.
Venus verrucosa, Linn.
Meretrix (Tivela) compressa, Sowb.
Meretrix (Chione) kochi, Phil.
Sunetta ovalis, Sowb.
Circe pectinata, Linn.
Tapes corrugatus, Gmelin
Venerupis robusta, Sowb.?
Schizodesma spengleri, Gmelin.
Mactra ovalina, Lamk.
Standella solandri, Gray.
(Syn. Petricola lyra, Melvill).
Gastrana abilgaardiana, Spengler.
Tellina rosea, Spengler.
Tellina natalensis, Krauss.
Tellina ponsonbyi, Sowb.
Tellina triangularis, Chemn.
*Tellina regularis, n.sp.
Psammotellina capensis, Sowb.
Macoma littoralis, Krauss.
Macoma cumana, Costa, var.?
Donax serra, Chemn.
Donax sordidus, Hanley.
*Semele capensis, n.sp.
*Theora ovalis, n.sp.
Solen capensis, Fischer.
Cultellus decipiens, n sp
(= pellucidus, Sowb. non Pennant).
Loripes clausus. Philippi.
(= L. lacteus, Sowb. non Linn).
Lucina despecta, n.sp.
(= L. columbella, Sowb. non Lamk.)
*Lucina valida, n.sp.
Cryptodon globosus, Forsk.
Felania subradiata, Sowb.
*Pholas fragilis, Sowb.
Nucula nucleus, Linn.

*Tellimya similis, n.sp.
*Montacuta macandrewi, Fischer.
Lasaea australis, Scuverbic.
Kellia rotunda, Desh.
Kellia mactroides, Hanley.
*Lepton fortidentatus, n.sp.

B. Descriptions of New Species and Remarks upon a few other previously described forms

Drillia thetis, n.sp.

Pl. ii, fig. 1.

Testa parva ovato-fusiformis, alba, rufescens, vel fuscescens; anfractus normales 5 convexi, costis obliquis leviter flexuosis (in anfr. penultimo 10—12) instructi, inter costas spiraliter tenuiter striati, sutura obliqua sejuncti, ultimus infra medium contractus, costis inferne evanidis, et pone labrum interdum plus minus obsoletis; apertura parva, irregulariter sub-ovata, longit. totius $\frac{2}{5}$ fere aequans; labrum tenue, arcuatim prominens, superne late sed haud profunde sinuatum; columella leviter arcuata, callo tenui induta.

Longit. 10 millim., diam. 4; apertura 4 millim. longa, 2 lata.

The rather convex whorls, the oblique and slightly flexuous ribs and the close fine spiral striae, are the principal features of this species. It seems to be variable in colour, some specimens being entirely white, others reddish or brownish. Some white examples have a brown zone below the suture and another round the middle of the body-whorl, and one pale specimen has some distant, obscure, reddish spots upon the upper part of the whorls. The spiral striae are most conspicuous between the costae.

Drillia subcontracta, n.sp.

Pl. ii, fig. 2.

Testa elongata, fusca, ad apicem mamillata, anfractus 8, superiores duo laeves, convexi, caeteri supra concavi, infra convexi, costis obliquis circiter 12, supra attenuatis, instructi, inter costas spiraliter fortiter striati, ultimus infra medium contractus, et costis obsoletis circa basim sulcatus; apertura sub-ovalis, supra et infra contracta, longit. totius circiter $\frac{1}{2}$ aequans; labrum tenue, haud profunde sinuatum; columella oblique arcuata, callo tenui pallido induta.

Longit. 12 millim., diam. 4.5; apertura 4 millim. longa, 2 lata.

The body-whorl is well rounded at the middle and then contracted below. A spiral striation or groove at the periphery, which also winds up the spire just above the suture, is usually more strongly marked than the rest.

Drillia albonodulosa, n. sp.

Pl. ii, fig. 3.

Testa parva, rufo-fusca, serie nodulorum alborum cincta, ovato-fusiformis; anfractus sex, superiores rotundati, laeves, caeteri supra excavati, infra convexi, costis nodiformibus albis obliquis infra instructi, spiraliter striati, ultimus ad medium nodose costulatus, infra circa basim oblique et fortius striatus; apertura parva; labrum ad marginem tenue, extus incrassatum, supra valde sinuatum; columella rectiuscula, callo tenui superne tuberculiforme induta.

Longit. 8.3 millim., diam. 4; apertura 3.3 millim longa, 1.5 lata.

A solid little species, well characterised by its style of colouration.

Drillia praetermissa, n. sp.

Pl. ii, fig. 4.

Testa breviter subfusiformis, fuscescens, pallide costulata, rufo-fusco maculata, lineis spiralibus albo et fusco articulatis subobscuris ornata; anfractus 8—9, apicales ?, caeteri supra concave declives, infra convexiusculi, costis obliquis 12—15 in concavitate obsoletis instructi, spiraliter tenuiter striati, ultimus costis infra medium evanidis, circa basim fortius strictus; apertura longit. totius $\frac{4}{11}$ adaequans, intus fuscescens; labrum arcuatim prominens, tenue, supra rotunde sinuatum; columella fere recta, callo tenui supra tuberculiforme induta.

Longit. 18 millim., diam. 7.

Allied to *D. nivosa*, but differing in colour and in its spire being more produced.

Drillia nivosa, n. sp.

Pl. ii, fig. 5.

Testa mediocriter elongata, pallide fuscescens, lineis numerosis spiralibus albo et fusco-punctulatis ornata; spira elongata, ad apicem mammillata; anfractus 7, duo superiores rotundati, laeves, caeteri supra concavi, infra convexi, costis obliquis (in concavitate obsoletis) 12—14 instructi, et spiraliter leviter striati, ultimus infra medium costis evanidis, circa basim fortius striatus; apertura longit. totius circiter $\frac{3}{8}$ adaequans; labrum tenue, arcuatum, supra subprofunde sinuatum; columella levissime curvata, callo tenui, superne tuberculiforme indutum.

Longit. 17 millim., diam. 6.5; apertura 6.5 longa, 3 lata.

Two or three of the dotted lines around the middle of the whorls are more clearly defined than the rest. The specific name has reference to the white specks which cover the surface.

Clathurella crassilirata, n. sp.

Pl. ii, fig. 6.

Testa parva, fusiformis, albida, infra suturam et circa basim fuscotincta; anfractus 7 ?, supra declives, infra liris duobus crassis spiralibus rotundatis

instructi, ultimus triliratus, infra concave contractus et oblique striatus; apertura longit. totius circiter $\frac{2}{3}$ aequans; labrum supra ad suturam profunde et rotunde sinuatum, antice rufotinctum; columella rectiuscula, vel leviter sinuosa, callo tenui induta.

Longit. 8 millim., diam. 3.5.

Well characterised by the strong rounded spiral lirae and the deep labral sinus.

Glyphostoma siren, n. sp.

Pl. ii, fig. 7.

Testa parva, oblonga, dilute fuscescens, circa medium anfract. ultimi albo zonata; spira gradata, ad apicem obtusa; anfractus 5, superiores $1\frac{1}{2}$ laeves, convexi, caetei convexiusculi, costis longitudinalibus circiter 10 et liris spiralibus (in anfr. ultimo 3—4) cancellati, ultimus liris circiter 10 cinctus: apertura angusta, longit. totius $\frac{1}{3}$ haud aequans; labrum incrassatum, superne conspicue sinuatum, intus sex-denticulatum; columella rectiuscula, callo tenui induta, tuberculis 2—3 minutis in medio munita.

Longit. 5.5 millim., diam. 2.3; apertura 2.5 millim. longa, 1 lata.

A rather strongly cancellated species, of a pale brownish colour with a zone round the middle of the body-whorl, which is also partly visible above the suture of the spire.

Daphnella (?) sulcata (Sowerby).

Cominella (?) *sulcata*, Sowerby: Marine Shells S. Afr., p. 11, pl. i, fig. 10, bad!

Hab.—Port Elizabeth (Sowb.).

The type of this species is in poor condition, so that certain features appear to have been overlooked in the original description. Of the six whorls the two apical ones are smooth, rounded, conspicuously large and mamilliform; the rest are rather convex and spirally grooved and ridged. They also exhibit lines of growth in the sulci, producing a sub-cancellated appearance, and the spirals are also faintly sub-granose. The labrum is a little thickened, ascends slightly upon the whorl above, and has a few minute tubercles upon the thickening within. The spiral lirae are about seven in number on the penultimate whorl and eighteen to twenty upon the last.

This species does not fall conveniently into any known genus, and although placed provisionally in the genus *Cominella* by Mr. Sowerby, it might with equal propriety be located in *Tritonidea*. In size and some other respects it recalls the general facies of some forms of *Daphnella*.

Most examples are uniformly light corneous and generally have a row of brown spots at the middle of the body-whorl, which is also continued up the spire.

Mangilia alfredi, n. sp.

Pl. ii, fig. 8.

Mangilia costata, Sowerby (nec Donovan): Marine Shells, S. Afr. p. 7.

Hab. Algoa Bay (Sowb.).

This South African species differs from *M. costata* in form, the aperture being shorter and broader, also in the six or seven ribs being more regularly continuous up the spire, and especially in the much stronger spiral striation. The striae are close-set, hair-like, continued on and between the costae, and are easily observable under a simple lens. The colour is somewhat variable. Some specimens are white with a broad band round the middle of the body-whorl. Others are light brownish, and with or without a darker peripheral zone.

Ancilla albozonata, n. sp.

Pl. ii, fig. 9.

Testa oblonga, supra acuminata, fusca, ad apicem alba, infra suturam et infra medium anfractus ultimi et circa basim albozonata; spira convexe acuminata, callo tenui induta; apertura elongata, longit. totius circiter $\frac{7}{10}$ aequans, intus fusca, antice infra columellam alba; labrum tenue, parum arcuatum, supra ad insertionem album, antice ad extremitatem zonae externae albo tinctum; columella antice quasi reflexa, oblique sulcata, fuscescens.

Longit. 20 millim., diam., 10; apertura 14 longa, 4.5 lata.

The coloration of this species is characteristic and constant. The top of the spire is white, a white band falls round the upper part or shoulder of the body-whorl, a narrower white zone accompanies the upper of the two oblique grooves across the lower part of the whorl, the base of which is also white. The surface is smooth, exhibiting only faint lines of growth.

Smaller than *A. cinnamomea*, Lamk., from the Red Sea, and differently coloured. It is the *cinnamomea* of Sowerby's "Marine Shells of S. Africa," p. 16.

Ancilla reevei, n. sp.

Pl. ii, fig. 10.

Testa elongato-ovata, pallide carnicolor, infra suturam pallidior, laevis; spira plus minus callo pallido induta; anfractus 5 ?, ultimus magnus, elongatus, convexiusculus, antice oblique bisulcatus, cingulo inter sulcos fusco maculato; labrum pallidum, parum arcuatum; columella antice incrassata, quasi reflexa, oblique sulcata, alba, vel dilute rosea.

Longit. 22 millim., diam. 10; apertura 12.5 millim. longa, 4.5 lata.

The colour is a pale fleshy tint, with a whitish or brownish zone beneath the suture, sometimes with a series of brown spots or dots upon the lower edge of it. The oblique girdle upon the front part of the body-whorl is also generally spotted with red. The reflexed columella is margined on the left side with an excavation or groove.

Fusus cingulatus, n. sp.

Pl. ii, fig. 11.

Testa breviter fusiformis, rimata, aurantia, ad angulum anfractuum albo cincta; anfractus 6, duo superiores globosi, laeves, caeteri supra oblique declives, in medio angulati et serie nodulorum instructi, tenuiter spiraliter lirati; ultimus lira conspicua paulo infra medium cinctus, antice in rostrum brevem productus; apertura supra irregulariter ovata, antice in canalem obliquum brevem producta; labrum simplex, tenue; columella arcuata, laevis, callo tenui albo induta.

Longit. 28 millim., diam. 14; apertura cum canali 14 millim. longa, 5·5 lata.

Recognisable by its style of colouration and the infraperipheral conspicuous lira. The nodules at the angle of the whorls gradually increase in size with the growth of the shell. There are about nine on the body-whorl.

Terebra suspensa, n. sp.

Pl. ii, fig. 12.

Terebra pertusa, Sowerby (nec Born): Marine Shells S. Afr., p. 24.

Testa parva, elongata, alba, pallide fusco maculata, ad apicem fuscescens; anfractus 12, duo superiores (protoconcha) laeves, dilute fusci, rotundati, mammaeformes, caeteri lente accrescentes, leviter convexi, paulo infra suturam subconstricti, costis longitudinalibus numerosis tenuibus arcuatis instructi, inter costas spiraliter punctati, ultimus ad peripheriam rotundatus, circa basim zona fusca cinctus; apertura parva; columella alba, brevis, rectiuscula, antice obliqua; canalis brevissimus, obliquus.

Longit. 20 millim., diam. 4.5; apertura 4 millim. longa, 2 lata.

Hab.—Port Elizabeth (Sowb.).

This species differs from *T. pertusa* of Born in its much smaller size, finer and more numerous spiral series of punctures, rather shorter whorls, and in colour. The dark infrasutural band, so characteristic of *T. pertusa*, is wanting in the present species. The upper part of the whorls in Born's species is smooth between the riblets and is marked off by a conspicuous row of punctures, whereas in *T. suspensa* it is punctate between the costae, and less clearly defined.

Columbella (?) pyramidalis, Sowerby.

Columbella (Mitrella) pyramidalis, Journ. Conchol., Vol. vii, p. 370; Marine Shells S. Afr. Append., p. 10, pl. vi, fig. 4.

Hab.—Port Elizabeth (Sowb.).

Variable in colouration, sometimes being white, streaked with brown at intervals, and generally with an interrupted narrow opaque white line at the periphery, sometimes bordered above with a brown line which ascends the spire above the sutural line. Some specimens are pale brown, streaked or mottled with white, and dotted with brown at the pale periphery and upon the slight infrasutural margination. The lower part of the body-whorl in some of these specimens is whitish. The species has a Terebra-like appearance.

Mitromorpha volva, Sowerby, **var.**

Pl. ii, fig. 13.

Testa ovato-fusiformis, supra pallide fuscescens, infra albida, circa medium anfract. ultimi fusco notata vel zonata; spira conica, ad apicem mamillata; anfractus 6, superiores duo laeves, rotundati, caeteri spiraliter lirati (liris in anfr. penult 4, infimo caeteris majori, albo, fusco picto, in ultimo circiter 15), in interstitiis longitudinaliter tenuiter striati: apertura angusta, longit. totius $\frac{1}{2}$ vix aequans; labrum tenue, vix incrassatum et supra inconspicue sinuatum; columella rectiuscula, laevis, in medio obsolete incisa.

Longit. 7.3 millim., diam. 3; apertura 3.5 millim. longa, 1 lata

At once recognised by its spiral sculpture and fusiformly ovate form. The whitish lira spotted with brown round the middle of the body-whorl, passes up the spire above the suture and is rather thicker than the rest. The specimens differ somewhat in colour, being of a rich brown tint, excepting the upper part of the whorls which is white with a few brown spots.

This variety differs from the type in colour and the stronger lirae. The typical form is uniformly very light brown, although described as white. It usually has five liuae on the penultimate whorl, whereas there are only four in the present variety.

Marginella punctilineata, Smith.

Two specimens differing somewhat from the type in colour. They are dirty whitish with slender brown lines, which are indistinctly dotted as in the normal form. The lower part of the columella is more or less stained with olive brown.

Marginella munda, n. sp.

Pl. ii, fig. 14.

Testa parva, fusiformis, alba, lineis angustis rosaceis subundulatis picta; anfractus 4 – 5 leviter convexi, sutura obliqua sejuncti; labrum mediocriter incrassatum, album, ad extremitatem posticam roseo maculatum; columella infra callo albo reflexo induta, quadriplicata.

Longit. 7 millim., diam. 3.3.

A small species characterised by its fusiform shape and style of colouration.

Marginella pura, n. sp.

Pl. ii, fig. 18.

Testa *M. metcalfei* similis, sed duplo major, antice minus contracta.

Longit. 6 millim., diam. 3.75.

This species quoted by Mr. Sowerby (Marine Shells S. Africa, p. 20) as the *M. metcalfei* of Angas, differs in size and shape. The Port Jackson shell is only 4 millim. in length, 2.5 in diameter, and is more contracted anteriorly. It is also not so pure white as the present species. Both have four columellar plaits. I cannot separate *M. metcalfei* and *M. ochracea*, both of Angas, and both from New South Wales.

Marginella differens, n. sp.

Pl. ii, fig. 19.

Testa parva, ovata, alba, nitida; spira brevis, ad apicem obtusa; anfractus $3\frac{1}{2}$ celeriter accrescentes; labrum incrassatum, intus denticulatum; columella callo induta, quadriplicata.

Longit. 5 millim., diam. 3.25.

This species was quoted by Mr. Sowerby (Marine Shells S. Africa, p. 20) under the name of *M. bulbosa*, Reeve. It is shorter than that species, has coarser denticulation within the labrum, the columella callus is more defined, and the second plication from the base is more produced to the left over the whorl. The plicae are usually four in number, but an indication of a fifth is sometimes observable. The denticles on the labrum are in the form of short lirae which are visible exteriorly through the transparency of the shell.

Marginella dulcis, n. sp.

Pl. ii, fig. 20.

Testa parva, alba, polita, subpellucida; spira brevissima alba, obtusa; anfractus 4; apertura angusta; labrum mediocriter incrassatum, intus laeve vel liris minutis brevibus 16–17 denticulatum; columella quinque vel sexplicata, plicis duobus anticis aliis majoribus.

Longit. 3.5 millim., diam. 2.2.

A very small subpellucid shell with the labrum smooth or minutely denticulate or lirate within; with a slight notch at the base or anterior end of the aperture, and six columellar folds, of which the two anterior are larger than the rest, which look more like minute denticles than plicae, and in adult specimens may be more or less obscured by callus.

Marginella pseustes, n. sp.

Pl. ii, fig. 21.

Testa minuta, ovata, alba, pellucida, nitida; spira rotundata, haud exserta; anfractus 3, ultimus fere totam testam formans; apertura angusta; labrum extus valde incrassatum, intus laeve, longit. totam testae aequans; columella triplicata, plica antica obliqua, maxima, inferne labro juncta.

Longit. 2 millim., diam. 1.3.

A very small species, ovate, with a rounded apex, a conspicuously thickened lip for so small a shell, and three folds at the anterior end of the columella, of which the basal one is the thickest and unites with the labrum in front.

Purpura texturata, n. sp.

Pl. ii, fig. 15.

Testa parva, ovato-turrita, pallide rufescens, supra porcas spirales rufo punctata; anfractus 6, superiores duo laeves, convexi, mamillaeformes, caeteri supra concavi, in medio nodose angulati, liris minutis spiralibus, incrementique lineis undique cancellati, ultimus porcis quaternis transversis instructus; apertura pallida, rufo fasciata, longit. totius $\frac{1}{2}$ paulo superans; columella alba, parum arcuata, callo tenui induta.

Longit. 22 millim., diam. 13; apertura 12 millim. longa, 6 lata.

Remarkable on account of the finely cancellated surface, the nodose angle of the whorls and the style of colouration. The ground colour is very light red, varied with dark brown or red dots or short lines upon the nodose angle of the whorls, and upon the three lower transverse ridges upon the body-whorl. Of these, that nearest the angle is also slightly nodose. The protoconch, consisting of about two whorls, is large, smooth and yellowish. The labrum is thin and very finely crenulated within the margin.

Quite distinct from *P. capensis*, Petit. The fine cancellation is quite different from the sculpture of that species.

Purpura castanea, Küster.

Purpura castanea, Krauss MSS., Küster: Conch. Cab., p. 170, pl. xxviii, figs. 8, 9.

Cominella unifasciata, Sowerby: Journ. Conchol., vol. v, p. 3; Marine Shells S. Africa, p. 11, pl. i, fig. 11; Appendix, p. 4, var. *concolor*.

Hab.—Cape Agulhas (Küster); Port Elizabeth and Natal (Sowb.).

The variety *concolor* of Sowerby's *Cominella unifasciata* is the same as the typical form of *castanea*.

Nassa poecilostieta, n. sp.

Pl. ii, fig. 16.

Testa acuminato-ovata, colore variabilis, aurantia vel fusca, sordide albida fusco lineata et punctata, circa medium anfractus ultimi linea interrupta fusca vel linea alba saepe picta; anfractus circiter 8 convexiusculi, costis leviter obliquis 12—16 lirisque spiralibus numerosis supra et inter costas continuis instructi, ultimus infra medium liris paucis crassioribus cinctus; apertura parva; labrum mediocriter incrassatum, intus liris brevibus 10—11 munitum, saepe pallidum, interdum in medio macula fusca pictum; canalis anticus saepe fusco tinctus; columella arcuata, callo tenui tuberculis 3—4 gerente amicta.

Longit. 14 millim., diam. 7; apertura intus 4.5 millim. longa, 3 lata.

This species is I believe the *N. coccinea* of A. Adams MSS. as understood by Mr. Sowerby (Marine Shells S. Africa, p. 12). As, however, I have never seen a scarlet specimen, and its colouration is so variable, I venture to propose the name *poecilostieta* for this apparently quite common shell. The manuscript name *coccinea* may therefore be disregarded in future. Mr. Sowerby in the Appendix to the above work (p. 5), has suggested that this species is the same as *N. coccinella*, Lamarck. This, however can scarcely be correct, as that species by general consent is regarded as synonymous with the common *N. incrassata* of British and European coasts.

Some specimens of the present species are uniformly orange, excepting the lip which is white within. Sometimes this variety has a white line round

the middle. Other specimens are uniformly rich brown. Some are dirty whitish, transversely lineated and dotted with brown, often with a more conspicuous interrupted line at the periphery which also passes up the spire above the suture. One specimen has the upper part of the shell pale, dotted with brown, and the lower half of the body-whorl bright orange. The costae are much more oblique in some examples than in others. In *N. fuscolineata*, Smith, from Japan, a closely allied species, the ribs slope in the opposite direction.

Bullia trifasciata, n. sp.

Pl. ii, fig. 17.

Testa oblonga, subturrita, alba, fusco fasciata; anfractus 7, vix convexi, sutura alba callosa obliqua discreti, spiraliter sulcati, sulcis in anfr. penultimo circiter 7, anfr. ultimus infra suturam leviter turgidus, deinde contractus, transversim sulcatus; apertura irregulariter ovata, supra acuminata, intus fuscescens, subfasciata; labrum tenue, arcuatum; columella callo albo crasso reflexo induta.

Longit. 39 millim., diam. 18.

Allied to *B. annulata*, Lamarck, but differently coloured, with a narrower body-whorl, a less sharply turreted spire, and a broader columellar callosity. Of the three brown bands upon the body-whorl, the uppermost upon the swollen edge of the whorl is the darkest.

Natica napus, n. sp.

Pl. ii, fig. 22.

Testa globosa, anguste umbilicata, alba, lineis incrementi tenuibus striisque spiralibus tenuissimus sculpta; spira brevis, obtusa, conoidea; anfractus 6 convexiusculi, ultimus infra suturam zona opaca alba ornatus et prope aperturam leviter concave depressus; apertura alba; columella incrassata, reflexa, supra callo crassiusculo labro juncta.

Diam. maj. 31 millim., min. 24; alt. 32.

This species is rather like *N. uber*, Valenciennes, from Peru, but has a different columellar callosity, and the columella itself is not so straight. *N. rapulum*, Reeve, is the same species as *N. uber*.

Natica decipiens, n. sp.

Pl. ii, fig. 23.

Testa parva, globosa, anguste umbilicata, lutescens, lineis undulatis numerosis luteis picta, infra suturam zona alba fusco-maculata, circa basim anfractus ultimi maculis fuscis notata, et infra umbilicum fusco tincta; spira brevis obtusa; anfractus quatuor, convexi, lineis incrementi striati, ultimus antice oblique descendens; apertura albida; columella callo fusco umbilicum semiobtegente instructa

Diam. maj. 9 millim., min. 6.5; alt. 8.

Allied to *N. queketti*, Sowb., but differently coloured, the body-whorl descends more, and there are differences in the umbilical opening and the columellar callus

Rissoina alfredi, n.sp.

Pl. ii, fig. 24.

Testa elongata, acuminata, alba; anfractus circiter 10, normales septem fere plani, oblique costati, costis leviter arcuatis, circiter 14, ultimus costis infra undulatis instructus, circa basim inter costas tenuiter liratus; apertura obliqua, acuminate ovalis; labrum paulo incrassatum; columella callo tenui reflexo induta.

Longit. 7 millim., diam. 2.5.

A pure white shell with very oblique ribs and some fine striae around the base of the body-whorl, where the costae are slightly waved.

Rissoa perspecta, n.sp.

Pl. ii, fig. 25.

Testa minuta, elongato-ovata, alba, pellucida, laevis; spira obtusa, ad apicem rotundata; anfractus 4, convexiusculi, infra suturam late hyalino-marginati, ultimus elongatus; apertura parva, pyriformis, $\frac{1}{3}$ longit. totius subaequans; peristoma continuum, leviter incrassatum, margine externo subpatulo, columellari, subreflexo, appresso.

Longit. 2 millim., diam. 1.

The form and colour are different in *R. conspecta* and the whorls are rounder. The peristome in the present species is thicker and a little patulous, and the pellucid margination below the suture is broader than in *conspecta*.

Rissoa conspecta, n.sp.

Pl. ii, fig. 26.

Testa minuta, ovato-turrita, pallide fuscescens subpellucida, nitida, lineis incrementi tenuibus striata, imperforata: spira ad apicem rotundata, obtusa; anfractus 5 convexi, infra suturam hyalino-marginati; apertura ovato-pyriformis, circiter $\frac{1}{3}$ longit. totius adaequans; peristoma continuum, margine externo tenui, columellari leviter vel vix reflexo.

Longit. 2 millim., diam. 1.

A very small glossy shell, of a pale brownish colour, without any sculpture, excepting the lines of growth. The peristome is perhaps rather paler than the rest of the whorl.

Eulima distincta, n.sp.

Pl. iii, fig. 1.

Testa parva, breviter subulata, alba, polita, ad apicem haud acuta, varicibus pluribus instructa; anfractus 8 fere plani, infra suturam leviter obliquam zona angusta pellucida ornati, ultimus ad medium obtuse vel obsolete angulatus;

apertura piriformis; labrum leviter incrassatum; columella arcuata, anguste reflexa.

Longit. 4.5 millim., diam. 1.5.

The slightly thickened labrum and the varices, or former labra, are the peculiar features of this species.

Eulimella nivea, n.sp.

Pl. iii, fig. 2

Testa alba, elongata, subulata, nitens, minute spiraliter substriata et lineis incrementi tenuibus sculpta; anfractus circiter 12 fere plani, sutura profunda leviter obliqua sejuncti, ultimus ad peripheriam rotundatus; apertura parva, rotunde subquadrata; labrum tenue; columella incrassata, reflexa.

Longit. 10 millim., diam. 2; apertura 1.3 longa.

A long, gradually tapering shell, consisting of numerous slowly increasing whorls which are separated by a deep suture. All three examples have lost the protoconch.

Eulimella minor, n.sp.

Pl. iii, fig. 3.

Testa elongata, gracilis, alba, polita, subpellucida; anfractus 10, duo apicales globosi, sinistrales, transversim siti, caeteri fere plani, sutura obliqua distincta sejuncti, infra suturam zona subopaca angusta cincti, ultimus ad peripheriam rotundatus; apertura subpiriformis; labrum simplex; columella leviter incrassata et reflexa.

Longit. 5 millim., diam. 1; apertura .75 longa.

A narrower shell than *E. nivea*, with longer, more rapidly increasing whorls. It is also more pellucid and exhibits an infrasutural zone.

Turbonilla gemmula, n.sp.

Pl. iii, fig. 4

Testa minima, pellucida, nitens, costis numerosis flexuosis obliquis tenuibus instructa; anfractus normales sex, convexi, sutura profunda obliqua sejuncti, ultimus costis infra medium obsoletis; apertura parva, irregulariter ovata; columella rectiuscula, levissime incrassata et reflexa.

Longit. 3.5 millim., diam. 1.

A very small pellucid shell with 17—18 oblique and slightly flexuous ribs, six normal whorls and a globose protoconch, consisting of about two whorls. Apparently there is no spiral sculpture of any kind.

Turbonilla decora, n.sp.

Pl. iii, fig. 5.

Testa elongata, alba; anfractus normales sex convexi, longitudinaliter oblique tenuiter costati, inter costas spiraliter striati, sutura obliqua profunda sejuncti, ultimus costis infra medium plus minus obsoletis, lineisque spiralibus haud interruptis; apertura longit. totius circiter $\frac{1}{4}$ aequans; columella vix incrassata, leviter reflexa, haud plicata.

Longit. 4 millim., diam. 1.

The embryonic sinistral shell forms a globose apex and consists of about two and a half whorls. The ribs on the penultimate whorl are about twenty in number and the spiral striae about ten.

Trifora fusecscens, n. sp.

Pl. iii, fig 6.

Testa parva, gracilis, fuscescens, quadricingulata, cingulo supremo aliis majori, planiusculo, caeteris subaequalibus rotundatis; anfractus circiter 18, fere plani, ultimus cingulis septenis, prope aperturam lineis incrementi sectis et subgranosis cinctus; apertura parva, rotunde quadrata, antice brevissime oblique canaliculata; labrum tenue, postice ad suturam sinuatum, in medio subpatulum, ad marginem leviter crenulatum.

Longit. 11.5 millim., diam. 2.25.

Some of the specimens named *T. cingulatus*, A. Ad., by Mr. Sowerby (Marine Shells of S. Africa, p. 36), belong to the present species. None of them agree with Adams' species, which was described from the Red Sea, and has strong longitudinal sculpture between the spirals.

Trifora fuscomaculata, n. sp.

Pl. iii, fig 7.

Testa elongata, gracilis, alba, fusco irregulariter maculata; anfractus circiter 20 planiusculi, lente accrescentes, quadricingulati, cingulis tuberculatis, duobus medianis aliis majoribus, longitudinaliter sulcati, subcancellati, ultimus infra peripheriam cingulis tribus haud granosis ornatus; apertura rotunde quadrata, antice breviter oblique canaliculata; columella supra arcuata, callo tenui induta.

Longit. 17 millim., diam. 3.5.

Var. (Pl. iii, fig. 8) Testa angustior, minor, cingulis tribus, superioribus aequalibus, distinctius et confertim tuberculatis.

Longit. 15 millim., diam. 3

The typical form is more distinctly blotched with brown than the variety.

Trifora convexa, n. sp.

Pl. iii, fig. 9.

Testa parva, fusca, ad apicem albida; anfractus 10 convexi, supremi duo pallidi, laeves, caeteri tricingulati, cingulis granosis, duobus inferioribus magis conspicuis, sutura filiformi sejuncti, ultimus ad peripheriam rotundatus, cingulis sex instructus; labrum subpatulum; columella callo crasso pellucido induta, supra incurva.

Longit. 5.5 millim., diam. fere 2.

The suture is marked by the lira which encircles the periphery of the body-whorl, and winds up the spire at, but above the actual suture.

Ethalia africana, n. sp.

Pl. iii, figs. 10, 11.

Testa minuta, depressa, orbicularis, pellucido-alba, nitens, supra et infra plus minusve spiraliter microscopice striata; spira depressa; anfractus tres, celeriter accrescentes, ultimus callo conspicuo supra instructus, et infra callo crasso umbilicale munitus, ad peripheriam rotundatus; apertura fere circularis, marginibus callo columellari crasso junctis.

Diam. maj. 1.75 millim.; alt. fere 1.

Remarkable on account of the callosity upon the upper surface of the body-whorl. Very like *E. perspicua* and *E. lucida*, A. Ad., from China and Japan, but with more basal callus, besides the callosity upon the upper surface. It is the *Teinostoma lucidum* of Sowerby's "Marine Shells of S. Africa," p. 13.

Cynisca fortieostata, n. sp.

Pl. iii, figs. 12, 13.

Testa *C. granulosae* similis, sed costis spiralibus crassioribus et minus numerosis instructa.

Diam. maj. 7.5 millim., alt. 6.

This species is of the same form as *C. granulosa*, Dunker (= *C. granulatum*, A. Ad.), but is distinguished by its fewer and stronger spiral ridges. They are seven in number on the body-whorl and prettily granular in well-preserved specimens, the one bordering the deep umbilicus being especially strong. In Dunker's species the ribs number 4—5 on the upper surface of the last whorl and 6—7 below. The colour of this species is white, sometimes dotted with pink above upon the ridges.

Retusa truncatula (Bruguière).

Utriculus truncatulus, Bruguière: Jeffreys, Brit. Conch., vol. iv, p. 421; Pilsbry, Man. Conch., vol. xv, p. 205, pl. xxi, figs. 11, 12, pl. xxiii, figs. 62—64.

Hab.—N. Europe, Mediterranean, Adriatic, Canaries.

I believe this species has been erroneously quoted by Mr. Sowerby as *Cylichna umbilicata*, Mont. (Marine Shells S. Africa, p. 52).

Ampullarina africana, n. sp.

Pl. iii, fig. 14.

Testa minima, irregulariter ovata, perforata, pallide fuscescens; anfractus 5, convexi, laeves, sutura profunda sejuncti; apertura concolor, piriformis; peristoma continuum, margine columellari albo, reflexo, externo intus prope insertionem incrassato.

Longit. 4 millim., diam. 3.

A small species without any striking characters. The surface is smooth, excepting very faint lines of growth. The whorls are very convex, and the suture almost channelled. The upper part of the whorls is more opaque than the lower portion, the shell being thickened within. This is seen within the aperture at the upper part.

Cultellus decipiens, n.sp.

Cultellus pellucidus, Sowerby (non Pennant): Marine Shells S. Africa, p. 54.

Testa *C. pellucido* similis, sed major, latere antico longiore.

This species is very like the well-known *C. pellucidus*, Pennant, of the British coast, but attains large dimensions, the largest specimen examined being 53 millim. in length. The position of the beaks is proportionately further back, so that the anterior portion of the shell is rather longer. The strengthening rib within the valves, which is in front of the hinge teeth, is longer, straighter and almost parallel with the dorsal edge.

Semele capensis, n.sp.

Pl. iii, figs 15, 16.

Testa parva, antice latior, postice acute rotundata, fere aequilateralis, compressa, albida, radiatim tenuissime striata, lineisque incrementi distantibus lamelliformibus ornata; umbones acuti, laeves; sinus pallii profundus, rotunde acuminatus; cicatrix antica elongata, postica latior.

Longit. 11 millim., alt. 8, diam. 3.5

This species may attain larger dimensions than those here given. Its sculpture (Fig. 16) recalls that of certain *Tellinae* such as *T. tessellata*, Desh., *T. carnicolor*, Hanley, etc.

Theora ovalis, n. sp.

Pl. iii, fig. 17.

Testa parva, tenuissima, ovalis, alba, fere aequilateralis, antice subbrevior, postice vix angustior; valvae nitidae, incrementi lineis tenuissimis striatae, mediocriter convexae; umbones parvi, acuti, leviter prominentes; dens cardinalis unicus in utraque valva, et fossa ligamenti margine incrassato pone limitata.

Longit. 9.5 millim., alt. 7, diam. 3.5.

There are only the faintest indications of lateral teeth on the hinder margin in each valve, and I cannot trace any pallial sinus.

Tellina regularis, n. sp.

Pl. iii, fig. 18.

Testa parva, inaequilateralis, tenuis, subpellucido albida, vel dilutissime fuscescens, concentrice tenuissime striata; margo dorsi anticus rectiusculus, leviter descendens, posticus brevior, magis declivis; latus anterius acute rotundatum, posterius subrostratum; dentes cardinales valvae dextrae duo divergentes; dens lateralis anticus brevis, prope umbones situs, posticus longior, tenuior; dentes cardinales valvae sinistrae duo, laterales nulli; sinus pallii profundissimus.

Longit. 14 millim., alt. 10, diam. 4-5

Some specimens are marked with radiating, broken-up, hair-like pellucid lines.

Macoma litoralis, Krauss.

This is the *Tellina (Macoma) calcarea* of Sowerby's Marine Shells, S. Afr., p. 57, and is separable from that northern species by its rather more equilateral form and by the pallial line which generally extends across the valves, reaching practically from scar to scar. The shell is sometimes white and sometimes reddish, and attains larger dimensions than the specimen described by Krauss. The largest example examined is 35 millim. in length.

Lucina despecta, n. sp.

Lucina columbella, Sowerby (non Lamarck): Marine Shells S. Africa, p. 61.

Testa *L. columbellae* paulo similis, sed tenuior, liris concentricis magis confertis, lunula infra umbones haud excavata, sulco obliquo postico minus profundo, umbonibus laevibus, haud concentrice liratis, marginibus valvarum intus laevibus, haud denticulatis.

Longit. 23 millim., diam. 16, alt. 24

Hab.—Port Elizabeth (Sowerby); Port Alfred (Turton).

Some specimens are white beneath the thin pale deciduous periostracum, others are rose tinted externally and of a deeper shade within. The hinge is more delicate than in *L. columbella*, especially the lateral teeth. It is remarkable that so distinct a shell should have been confused with that species.

Lucina valida, n.sp.

Pl. iii, fig 19.

Testa parva, solida alba, subpiriformis, inaequilateralis, confertim concentrice lirata et radiatim striata, umbones prominentes, acuminati, incurvati; valvae crassae, sulcis 2—3 remotis concentricis sculptae intus ad marginem ventralem minute crenulatae.

Longit. 7 millim., alt. 7, diam. 4.

Belonging to the same group as *L. perten*, Lamk., but smaller, and more solid. The two or three grooves at intervals are peculiar, and apparently indicate periods of arrested growth. The radiating striae cut across the concentric lirae and give them a somewhat granose appearance. The lirae are closely packed, being merely separated from one another by striae-like grooves.

Loripes clausus, Philippi.

Lucina clausa, Philippi: Abbild., vol. iii, p. 101, pl. ii, fig. 2.

Loripes lacteus, Linn: Sowerby, Marine Shells S. Africa, p. 61.

This South African shell is quite distinct from the European *L. lacteus*, being rather flatter, much larger having a deeply excavated lunule, and differing in other respects as pointed out by Phillippi.

Lepton fortidentatus, n.sp.

Pl. iii, fig. 20.

Testa parva, triangulariter ovata, aequilateralis, mediocriter convexa, alba, undique conspicue punctata, lineisque incrementi hic illic striata; margo dorsi utrinque declivis, vix curvatus, ventralis late arcuatus; latera acute rotundata; dens lateralis crassus prope umbonem in utraque valva, posticus gracilior.

Longit. 5.5 millim., alt 4, diam. 2.5.

Remarkable on account of the pitted surface, very like that of a finely punctate thimble.

Tellimya similis, n.sp.

Pl. iii, fig. 21.

Testa parva, leviter compressa, oblonga, utrinque rotundata, inferne rectiuscula vel in medio incurva, leviter inaequilateralis, nitida, lineis incrementi striata; margo dorsi utrinque declivis; latus anticum rotundatum, posticum paulo angustius; dentes duo divergentes valvae sinistrae subvalidi et margo utrinque umbonem valvae dextrae prominens; pagina interna laevis, nitida.

Longit. 6.5 millim., alt. 4.5, diam. 2.5.

Allied to *Tellimya producta*, Smith, from St. Helena, but less convex, longer in proportion to the height, and with longer, stouter, and more divergent teeth in the left valve.

Cardita (?) minima, n.sp.

Pl. iii, fig. 22.

Testa oblique subpiriformis, minima, mediocriter compressa, laevis, incrementi lineis tenuibus striata, pellucido-alba, vel pallide rosea, lineis opacis, albis, plerumque interruptis et guttatis, radiatim picta, radiis duobus, rufescentious aliquando ornata; umbones acuminati, antice curvati; margo dorsi posticus elongatus, curvatus, anticus brevior, concavus; lunula excavata, margine distincto circumdata; cardo validus, dente unico in valva sinistra, duobus in valva dextra, postico valde prominente, margine postico valvae sinistrae et antico valvae dexrae sulco instructo; pagina interna albida, vel rosacea, radiata, margine ventrali leviter dentato.

Longit. 3 millim., alt. 3, diam. 2.

Provisionally placed in the genus *Cardita* until more specimens are available, so that the hinge-characters can be more thoroughly examined. Allied to *Cardita elata*, Sowerby, but not costate like that species, and different in colour and form.

Carditella laticosta, n.sp.

Pl. iii, fig. 23.

Testa parva, oblonga, compressa, valde inaequilateralis, alba, interdum rufo maculata, costis radiantibus latis curvatis 12 instructa, lineisque incrementi striata; margo dorsi anticus brevis, valde declivis, posticus longior, vix

descendens, ventrali fere parallelus; latus anticum anguste rotundatum, posticum latius, oblique curvatum; umbones parvi, acuti; lunula angusta, excavata; pagina interna alba, radiatim fortiter sulcata, supra marginem dorsalem rufo tincta.

Longit. 7.5 millim., alt. 4.5, diam. 3.

The hinge is normal, consisting of a single cardinal tooth in the right valve and two in the left, with two laterals in each valve, whereof the anterior in the right and the posterior in the left are a little stouter than the others.

Hochstetteria velaini, n.sp.

Pl. iii, fig. 24.

Testa parva, obliqua, tenuis, alba, lineis pellucidis in medio radiata, inaequilateralis, nitida, convexa, incrementi lineis striata, supra latus posticum lira tenui, ab umbone usque ad marginem producta, instructa; latus anticum obliquum, parum arcuatum, posticum leviter incurvatum; umbones prominentes, incurvati; linea cardinis crassa, fere recta, transversim striata, in medio fossa ligamenti triangulari sculpta; pagina interna marginibus ventrali et postico crenulatis.

Longit. 3.5 millim., alt. 4, diam. 2.5.

The slender lira on the posterior side runs down a shallow depression in the valves, which causes the faint sinuation in the outline. Named after the author of the genus.

Hochstetteria limoides, n.sp.

Pl. iii, fig. 25.

Testa minima, ovato-subpiriformis, alba, fere aequilateralis, radiatim tenuissime costulata; latus anticum oblique truncatum, leviter excavatum, posticum curvatum; umbones prominentes; linea cardinis crassa, transversim striata, in medio fossa ligamenti angusta obliqua interrupta, ad extremitatem posticam infra dentibus lateralibus duobus tuberculiformibus instructa; pagina interna leviter radiatim sulcata, ad marginem tenuissime denticulata.

Longit. 2.6 millim., alt. 3.3, diam. 2.

As regards form and the radiating costae, this species has the appearance externally of a minute *Lima*.

Modiola tenerrima, n.sp.

Pl. iii, fig. 26.

Testa parva, oblonga, tenuis, antice angustata, postice paulo dilatata, pallida, purpureo tincta, maculata et lineata, lineis incrementi tenuissimis sculpta, antice infra umbones sulcis 2—3 radiantibus ornata; margo dorsi rectus, pulcherrime minute denticulatus, ventralis levissime incurvatus; pagina interna margaritacea, lineis rufo-purpureis subundulatis variegata.

Longit. 13 millim., alt. 7, diam. 4.5.

Quite distinct from any of the other S African mussels. The most remarkable feature is the prettily dentate dorsal margin of the valves, the crenulation extending on both sides the umbones. The two or three radiating sulci at the anterior end are visible within the valves also.

Limopsis pumilio, n.sp.

Pl. iii, figs. 27, 28.

Testa minima, trigona, crassa, alba vel rufo maculata, laevis; margo dorsi utrinque valde declivis, rectiusculus, ventralis curvatus; umbones peculiares, quasi truncati; cardo crassissimus, dentibus anticis tribus, posticis quaternis munitus; sulcus ligamenti profundus; pagina interna radiatim striata; cicatrices profundae.

Longit. 3 millim., alt 3.25, diam. 2.

Remarkable for the strength of the hinge and the peculiar umbones which have the appearance of being truncate, but, when the tip is closely examined, appear to have a circular cap.

Lima perfecta, n.sp.

Pl. iii, fig. 29.

Testa parva, convexa, alba, radiatim costata et sulcata, costis granosis, sulcis aequantibus, clausa, antice oblique truncata, profunde excavata, postice et inferne regulariter curvata; valvae crassiusculae; area dorsalis parva, excavata, fossa ligamentali obliqua triangulari sculpta; pagina interna radiatim sulcata, ad marginem late dentata.

Longit. 12 millim., alt. 15, diam. 10.

The costae are about eighteen in number, exclusive of a few finer ones near the posterior margin, and those in the anterior excavation which are also finer than those on the central part of the valves.

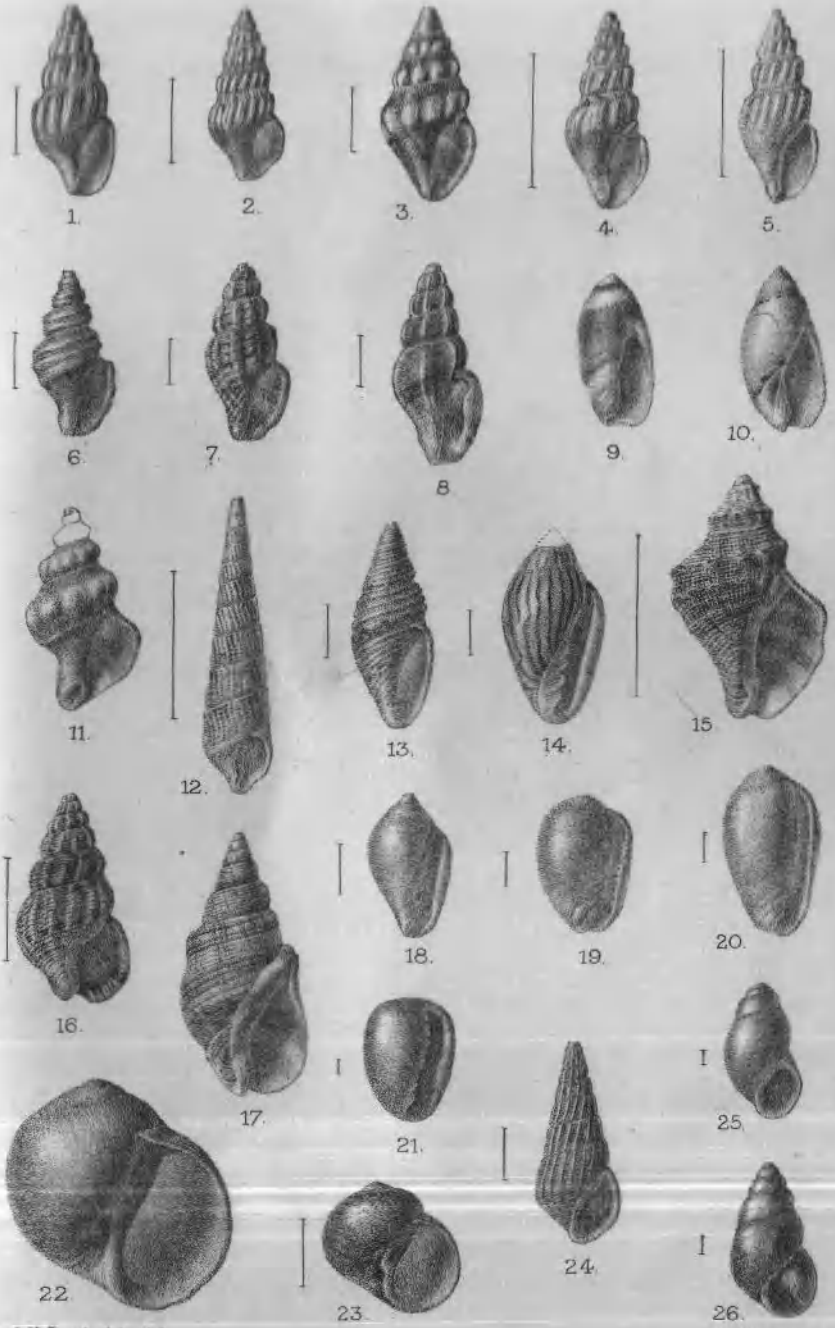
EXPLANATION OF PLATES.

Plate II.

Fig. 1. *Drillia lluctis*, n. sp.
Fig. 2. *Drillia subcontracta*, n. sp.
Fig. 3. *Drillia albonodulosa*, n. sp.
Fig. 4. *Drillia praetermissa*, n. sp.
Fig. 5. *Drillia nivosa*, n. sp.
Fig. 6. *Clathurella crassilirata*, n. sp.
Fig. 7. *Glyphostoma sireu*, n. sp.
Fig. 8. *Mangilia alfredi*, n. sp.
Fig. 9. *Ancilla albozonata*, n. sp.
Fig. 10. *Ancilla reevei*, n. sp.
Fig. 11. *Fusus cingulatus*, n. sp.
Fig. 12. *Terebra suspensa*, n. sp.
Fig. 13. *Mitromorpha volva*, Sowb., var.
Fig. 14. *Marginella munda*, n. sp.
Fig. 15. *Purpura texturata*, n. sp.
Fig. 16. *Nassa poecilosticta*, n. sp.
Fig. 17. *Bullia trifasciata*, n. sp.
Fig. 18. *Marginella pura*, n. sp.
Fig. 19. *Marginella differens*, n. sp.
Fig. 20. *Marginella dulcis*, n. sp.
Fig. 21. *Marginella pseustes*, n. sp.
Fig. 22. *Natica napus*, n. sp.
Fig. 23. *Natica decipiens*, n. sp.
Fig. 24. *Rissoina alfredi*, n. sp.
Fig. 25. *Rissoa perspecta*, n. sp.
Fig. 26. *Rissoa conspecta*, n. sp.

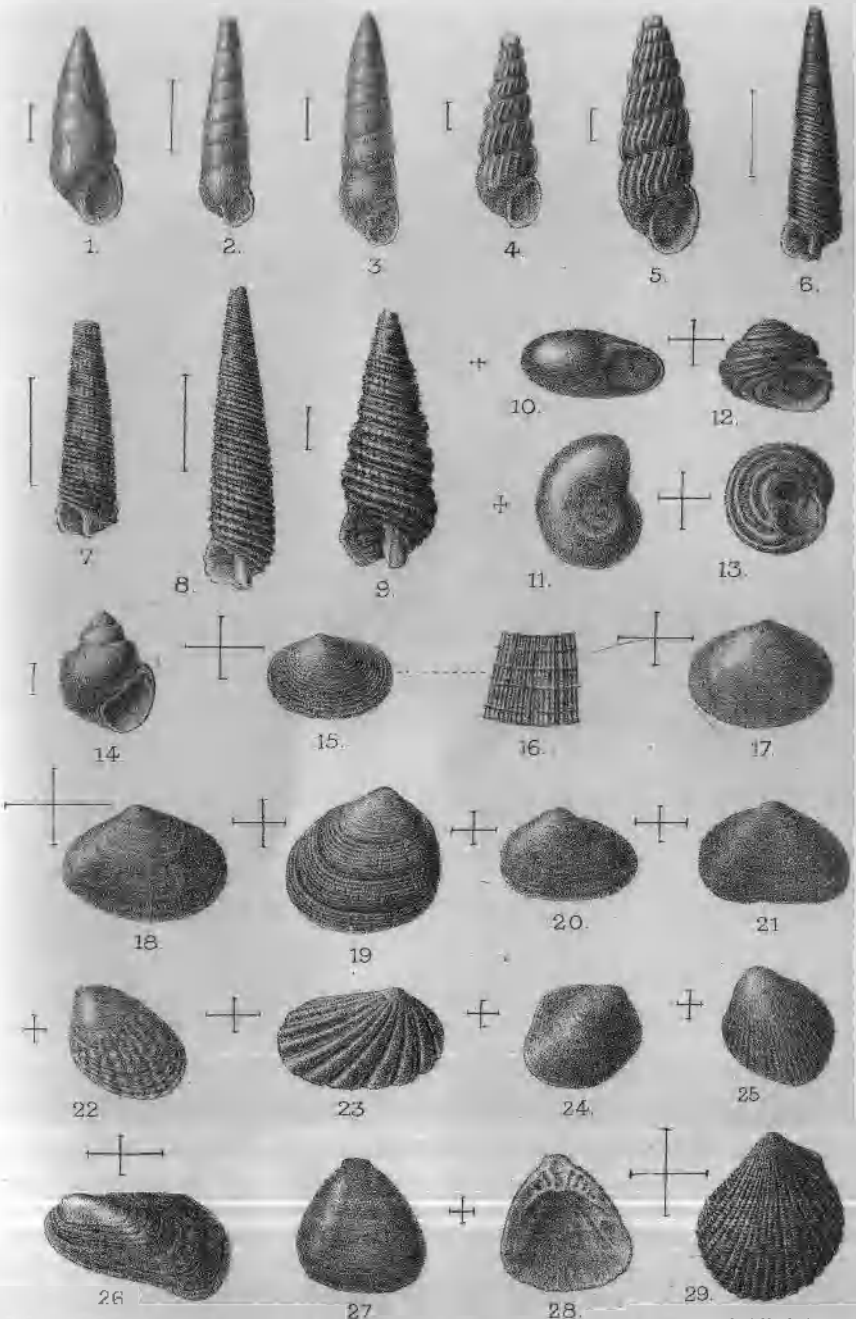
Plate III.

Fig. 1. *Eulima distincta*, n. sp.
Fig. 2. *Eulimella nivea*, n. sp.
Fig. 3. *Eulimella minor*, n. sp.
Fig. 4. *Turbonilla gemmula*, n. sp.
Fig. 5. *Turbonilla decora*, n. sp.
Fig. 6. *Trifora fuscescens*, n. sp.
Fig. 7. *Trifora fusconaculata*, n. sp.
Fig. 8. *Trifora fusconaculata*, var.
Fig. 9. *Trifora convexa*, n. sp.
Figs. 10, 11. *Ethalia africana*, n. sp.
Figs. 12, 13. *Cynisca forticostata*, n. sp.
Fig. 14. *Ampullarina africana*, n. sp.
Fig. 15. *Semele capensis*, n. sp.
Fig. 16. *Semele capensis*, sculpture [magnified.
Fig. 17. *Thecra ovalis*, n. sp.
Fig. 18. *Tellina regularis*, n. sp.
Fig. 19. *Lucina valida*, n. sp.
Fig. 20. *Lepton forbidentatus*, n. sp.
Fig. 21. *Tellimya similis*, n. sp.
Fig. 22. *Cardita minima*, n. sp.
Fig. 23. *Carditella laticostata*, n. sp.
Fig. 24. *Hochstetteria vetaini*, n. sp.
Fig. 25. *Hochstetteria limoides*, n. sp.
Fig. 26. *Modiola tenerrima*, n. sp.
Figs. 27, 28. *Limopsis pumilio*, n. sp.
Fig. 29. *Lima perfecta*, n. sp.



A.H. Searle, del. et lith. A.S. Huth, imp.

NEW SPECIES OF SOUTH AFRICAN MARINE SHELLS.



NEW SPECIES OF SOUTH AFRICAN MARINE SHELLS.

NOTE ON CORILLA ERRONELLA, NEV., MS.

By G. K. GUDE, F.Z.S.

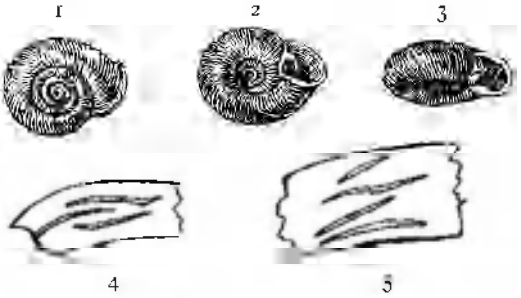
The collection of the late Hugh Nevill, which came under the hammer at Stevens' Sale Rooms on the 10th of May last, contained a number of shells of *Corilla*, which, at first, I was inclined to regard as a new species.

The lot was acquired by Mr. H. B. Preston, who kindly placed several of the specimens at my disposal and upon closer examination the shell in question appears to be identical with one which Colonel Beddome received years ago with the manuscript name *Helix erronella*, Nev., Ceylon, and which I figured and named provisionally *Corilla erronea*, var. *erronella* (Science Gossip, (N.S.) III, (1896) p. 127, fig. 16.) The large amount of material now at command enables one to form a more accurate estimate as to its rank, and in view of the constant and considerable differences both in the ordinary shell characters and in the armature, I have no hesitation in according it specific rank. Unfortunately no record of the precise habitat has been found, but there can be no doubt that the shells were collected in Ceylon.

I am now in a position correctly to define the species and to illustrate the armature more fully from specimens opened for that purpose.

Corilla erronella, Nev., MS.

Shell discoid, elliptic, widely umbilicated, dark corneous, or chestnut; a little shining above, polished below, finely and regularly ribbed; spire plane, suture



impressed; whorls $4\frac{1}{4}$ to $4\frac{1}{2}$, slightly flattened above, rounded at the periphery, tumid below, increasing slowly at first, the last suddenly widening and dilated at the aperture, deflected in front, constricted behind the peristome; nepionic whorls ($1\frac{1}{2}$) almost smooth. Aperture nearly horizontal, ovate-obcordate, margins distant, united by a sinuous fold on the parietal wall. Peristome fuscous or pinkish, thickened and well reflexed; upper margin very shortly ascending at first, then descending, with a more or less strong inward inflection; outer margin curved, lower margin with a strong oblong tubercular tooth. Parietal armature consisting of three elongated curved folds: the

first (upper) shortest; the second longest, united to the sinuous fold at the aperture, free posteriorly; the third—near the lower suture—slowly ascending posteriorly. Palatal folds four: the first (upper) shortest, slightly curved, descending posteriorly; the second longest, the anterior half ascending, the posterior half almost horizontal; the third, a little longer than the first, scarcely curved, descending very obliquely posteriorly; the fourth nearly as long as the second, curved parallel with, and near to, the lower suture, and reaching nearly to the aperture.

Major diam. 16—18, minor 12.5; alt. 5.5 millim.

Hab.—Ceylon. Type in Col. Beddome's collection.

From *Corilla erronea*, Alb., its nearest ally, *C. erronella* differs in its more regular contour and its smaller size. The riblets are more pronounced and more regular and do not anastomose, while the incised spiral lines on the lower surface, so conspicuous a feature in *C. erronea* and many of its allies are usually lacking. In the armature there are considerable differences: the the second parietal fold, which in *C. erronea* is united posteriorly to the first, is here quite free posteriorly. The palatal folds are generally shorter and much nearer the peristome, being all visible from the aperture; while the third fold, which in *C. erronea* is very short and nearly horizontal, is here longer and obliquely descending. Figs. 1—3 show the shell in three different positions, while a diagrammatic view of the armature is given in figs. 4 and 5, the former showing the parietal folds and the latter exhibiting the palatal folds as they appear within on the outer wall. A number of immature shells show the usual five palatal folds, the first four very oblique, the fifth small and horizontal, but no parietal barriers, which do not appear to be formed until the shell reaches maturity.

DESCRIPTION OF A NEW SPECIES OF ARIUNCULUS FROM ALGERIA.

By WALTER E. COLLINGE, M. Sc.,
The University, Birmingham.

Some short time ago I received from Mr. P. Pallary a number of live specimens of Algerian slugs, amongst which was the specimen forming the subject of this paper. Unfortunately there was only a single specimen, but Mr. Pallary has very kindly promised to try and procure more, in order that a more detailed account may be given of the generative organs and a coloured figure of the animal.

I have much pleasure in associating the name of Mr. Pallary with this interesting species.

Ariunculus pallaryi, n. sp.

Animal (alive) reddish-brown, darker medio-dorsally, with three faint, ill-defined, blackish lines running from the posterior border of the mantle to the tail, where they converge; mantle smooth, light brown, with faint reddish tinge, which latter quickly disappears on placing in alcohol; head and tentacles yellowish-brown, darker dorsally. Rugae elongated, flat, clearly marked by definite sulci. Caudal gland well defined, but partially hidden by the margin of the foot. Respiratory orifice situated towards the anterior end of the mantle. Generative orifice about half way between the right upper tentacle and the respiratory orifice. Peripodial groove sharply marked. Foot-fringe and foot-sole lighter in colour, latter divided into median and lateral planes.

Length (alive) 72 millim.; (in alcohol) 50.

Shell a thick, somewhat pyriform calcareous plate.

Maj. diam. 6.2 millim., min. 4.

Hab.—Echmühl, Oran, Algeria (P. Pallary).

This, the largest known species of *Ariunculus*, at first sight gives one the impression of an elongated form of *Arion subfuscus*, Drap. Anatomically it is very distinct from any of the described species.

The vestibule of the generative organs leads into an elongated vagina, which suddenly widens out to form a large globular sac, with a somewhat complicated internal structure. From the posterior and outer border of this sac the receptacular duct is given off, while ventrally and slightly anteriorly is a large retractor muscle. On the same side at the anterior end is the free-oviduct, and at the opposite side and posteriorly the sperm-sac arises.

The remaining organs have not yet been examined in any detail.

SOME RECENT SLUG PAPERS.

By D. F. HEYNEMANN.
Frankfort on Main.

Dr. Simroth has recently sent me two papers on Slugs, a group of molluscs upon which he has been working for many years with inexhaustible zeal and success.

The first is on the *Philomycidae* and *Arionidae* (Sitz. ber. naturf. Gesell. Leipzig, Jan. 14th, 1902) of which, as well as the second, the reprint is just coming to hand. A more detailed treatise of the two families is promised, which will be published in Tokio, in the meantime a preliminary account is given, which draws into the range of discussion, in the course of various divisions devoted to anatomy, such genera as *Oopelta*, *Anadenus*, etc. Of the genus *Philomycus* the following are treated of: *P. striatus*, v. Hass., from Java, *P. balius*, n.sp., and *P. tonkinensis*, n.sp., both from Tonkin, *P. taivanensis*, n.sp., from Formosa, *P. doederleini*, n.sp., from the Island of Liu-Kiu, *P. bilineatus ?*, Bens., from the Japanese Islands, *P. melachloros*, n.sp., from Tsu-shima, an island between Japan and Korea, and *P. viperinus*, n.sp. from Japan.

The second paper has has the title "Ueber die von Herrn Dr. Neumann in Abessinien gesammelten aulacopoden Nacktschnecken (Zool. Jahrb. (Abth. f. Syst.), 1903, Bd. 19). Of the three families discovered, viz., the *Vaginulidae*, *Limacidae*, and *Urocyclidae*, the concurrence of which in the Abessinian highlands presents a most remarkable circumstance, the *Vaginulidae* are reserved for a later occasion and only the genera *Agriolimax*, *Atoxon*, and *Spirotoxon* are dealt with. The following are described as new: *Agriolimax afer*, *wataderensis*, *yardullanus*, *gofanus*, *glandulosus*, *koschanus*, *kontanus*, *concrementosus*, *kaffanus*, *abessinicus*, *deckeni*, *gimirranus*, *fuscus*, and *limacoides*, the latter as the link between *Agriolimax*, Mörch, and *Lehmannia*, Heyn.

After Dr. Simroth's recent description of a similarly large number of species of this genus from the Caucasus (Die Nacktschnecken des Russischen Reiches, 1901), where he locates the centre of origin of the genus, it certainly surprises me to see described such a variety of species from a very distant district, without an example of any of those of the Palaearctic region. Dr. Simroth, however, does not fail to give an explanation; he considers the difficulty to be very simply solved by the Pendulum theory, which has been defended and perfected by him. The theory of the pole of oscillation between Sumatra in the east, and Equador in the west; the only points in the world which have retained their equatorial position from early times, and from which the remains of ancient species existing then in refuge, could spread according to the temporary changes in the formation of dry land along the equator again, and from there northwards and southwards, according to Dr. Simroth.

In the *Urocyclidae* there are described from the Neumann collection, *Itoxon erlangeri*, *Spirotoxon neumanni*, and from the former collection of Stuhlmann *S. stuhlmanni*.

Finally the opportunity is taken to set up a new genus *Varania*, with a single new species *V. loennbergi*, found in the stomach of a species of *Varanus* in Cameroon by Mr Loennberg of Upsala.

There were also found at the same time some 60 or 70 Veronicellas.

Simroth assumes that Slugs from the Cameroons have up to the present been unknown, but he overlooks the fact that he himself has reviewed a work by Adolf d'Ailly (Contributions à la connaissance des Mollusques terrestres et d'eau douce de Kaméroun), in which various slugs are mentioned, e.g. *Aspidelus chaperi*, Morelet, *Vaginula pleuroprocta*, v. Martens, and *Urocyclus buchholzi*, v. Martens, and that he declared the *Urocyclus* to be very like his *Dendrolimax continentalis*.

NOTES.

Note on Testacella haliotidea, Drap. My garden at Aldenham abounds in this curious slug. In digging over last year's celery bed, the gardeners turned it up by dozens, and I observed that it was numerous in a series of broad bands stretching across the bed, while in other parts of the area it was absent. These broad bands represented the former position of the celery trenches: doubtless the manure attracted the worms, and the worms the Testacella. Perhaps it was for a similar reason that we found it abundant on an old marrow bed.

As a rule, it was living at a depth of about 12 inches. On four separate occasions I found it on the surface; twice under large flint stones, once under a heavy elm log, the latter being in a part of the garden never under cultivation. On the fourth occasion I noticed a large specimen crawling across a wide gravel walk at eleven o'clock on a fine bright morning. This seemed to me remarkable, for I have never before observed the creature taking a voluntary walk in the upper world, and there was no indication that my specimen had been the prey of a bird, nor had there been any disturbance of the soil anywhere near.

Since the above was written, I have satisfied myself by repeated observation, that the Testacella habitually crawls about on the surface of the ground.

A. H. Cooke.

Note on Parmacella deshayesii, Moq.-Tand. In February last Mr. P. Pallary sent me a number of living slugs from Echmühl, Oran, Algiers, amongst which were some examples of *Parmacella deshayesii*, Moq.-Tand. Some of these I turned out in the garden beneath a mass of cabbage and lettuce leaves. On March 26th, I noticed they were pairing, and a few days later there were two or three groups of eggs averaging a dozen each. The eggs of this mollusc are oval, and when deposited have a pearly lustre, which, however, quickly disappears leaving them a dead opaque white. The maximum diameter is 6 millim. and the minimum 4. On April 27th, about a third had hatched out and I was hoping I should be able to rear them, but turning over the lettuce leaves on May 7th, I found all had been killed by the night frosts, as well as some adults which arrived on April 21st.

Walter F. Collinge.

CURRENT LITERATURE.

Hoyle, William E.—Reports on the Scientific Results of the Expedition to the Tropical Pacific, in charge of Alexander Agassiz, on the U.S. Fish Commission Steamer "Albatross," from August, 1889, to March, 1900, Commander Jefferson T. Moser, U.S.N., Commanding. Report on the Cephalopoda. Bull. Mus. Comp. Zoöl. Camb., Mass., 1904, vol. xliii, pp. 1—71, plts. 1—12, text figs. A—G.

The collection here described by Dr. Hoyle consists of thirty species, distributed in nineteen genera, of which the following are new: *Stauroteuthis hippocrepium*, *Froekenia clara*, gen. et sp. nov., *Tremoctopus scalensus*, *Polypus oculifer*, *Cirrobrachium filiferum*, gen. et sp. nov., *Loligo diomedeae*, *Rhynchoteuthis chuni*, *Mastigoteuthis dentata*; in addition to these, there are a few forms to which the author has not found it possible to affix names.

A List of Stations, with the species obtained at each is given, and an Appendix treats of the Luminous Organs of *Pterygioteuthis giardi* and *Abraliopsis hoylei*.

The paper is beautifully illustrated. In the preparation of certain plates the author remarks that he has "utilised a number of water-colour drawings made on the expedition by Mr. Agassiz and Mr. Magnus Westergren whilst the animals were still fresh and the colours of life retained. It would be well if this practice had been followed on other expeditions, as the appearance of Cephalopoda changes very markedly after preservation in alcohol."

Melvill, J. Cosmo.—Descriptions of twenty-three species of Gastropoda from the Persian Gulf, etc. Proc. Malac. Soc. Lond., 1904, vol. vi, pp. 51—60, pl. v.

Melvill, J. Cosmo.—On *Berthais*, a proposed new genus of Marine Gastropoda from the Gulf of Oman. Ibid., pp. 61—63, figs. I, II.

The type of this genus was described some short time back as *Scala (Constantia) intertexta*, Melv. & Stand. Since then Mr. Melvill has submitted the shell to Dr. Dall, who regards it as belonging to a new genus. Its nearest ally, Mr. Melvill regards as *Aclis*, while *Constantia* is not far removed.

As has already been suggested by Mr. Edgar A. Smith, *Onoba egregia*, A. Ad., also belongs to the same genus.

Melvill, J. Cosmo.—Note upon *Oliva gibbosa*, Born, and its limits of variation. Ibid., pp. 64, 65.

Burne, R. H.—Notes on the Nervous System of the Pelecypoda. Ibid., pp. 41—47, figs. i—iii.

Collinge, Walter E.—Some Remarks on the genera *Damayantia*, Issel., *Collingea*, Simr., and *Isselentia*, Cllge. Ibid., pp. 9—12.

Collinge, Walter E.—Contributions to the Terrestrial Zoology of the Faroes. By Nelson Annandale. Land and Freshwater Mollusca. Proc. Roy. Physical Soc. Edinb., 1904, vol. xv, pp. 153, 154.

Simroth, Heinrich.—Über *Ostracolethe* und einige Folgerungen für das System der Gastropoden. Zeit. f. wiss. Zool., 1904, Bd. lxxvi, pp. 612—672, T. xxxii.

Dr. Simroth here gives a more detailed account of *Ostracolethe fruhstorferi* described in 1901, and which he regards as synonymous with *Myotesta*, Cllge.

Simroth, H.—Über Philomyciden und Arioniden. SB. Naturf. Gesell. Leipzig, 1901 pp. 32—45.

THE

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ON SOME NEW SPECIES OF MELANIA AND JULLIENIA FROM YUNNAN AND JAVA.

BY HUGH FULTON.

(Plate iv.)

Melania aeruginosa, n. sp.

Pl. iv, fig. 1.

Shell solid, dark rusty brown, smooth, surface somewhat shining, sculptured with a few distant oblique and rather obtuse folds, prominently channelled at the suture, the margin of which, especially on the last whorl, is rather prominent; apex eroded, $5\frac{1}{2}$ whorls remaining, almost flat, aperture sub ovate, bluish-grey within; peristome thin, sinuous above.

Maj. diam. $13\frac{1}{2}$; alt. 33 millim.

Hab.—Soekaboemi, Java.

Strongly characterised by its canaliculate suture.

Melania dulcis, n. sp.

Pl. iv, fig. 2.

Shell rather thin, dark brown, elegantly ornamented by spiral rows of small granules, six on the last whorl, with two other less granular striae below. Apex slightly eroded, $7\frac{1}{2}$ whorls remaining, slightly convex; aperture broadly ovate, light bluish-grey within, the interstices between the external granules showing through as darker-coloured squarish spots; peristome very thin.

Maj. diam. 13; alt. 44 millim.

Hab.—Yunnan-fu Lake, Yunnan.

A distinct and very elegant species.

Melania fortitudinis, n. sp.

Pl. iv, fig. 3.

Very solid, yellowish-olive colour, spirally striated, seven or eight spiral costae on the last whorl, crossed by oblique folds which are prominently noduled

above, margined at the suture by a somewhat depressed nodulous channel. Apex somewhat eroded, 6 whorls remaining, moderately convex, aperture narrowly ovate, bluish-grey within, peristome acute.

Maj. diam. 12½; alt. 37 millim.

Hab.—Soekaboemi, Java.

This species has some superficial resemblance to the Ceylon form *M. broti*, Dohrn, but that has coarser sculpture and the whorls increase more rapidly.

Melania lauta, n. sp.

Pl. iv, fig. 4.

Shell thin, dark brown, ornamented by spiral rows of granules. Apex eroded, 4 whorls remaining, slightly convex; aperture ovate, bluish-grey within: peristome rather thin.

Maj. diam. 12; alt. 28 millim.

Hab.—Yunnan-fu Lake, Yunnan.

In general character very like *dulcis*, but much shorter and much more deeply depressed at the basal area of the columella.

Jullienia carinata, n. sp.

Pl. iv, fig. 5.

Shell subglobular, whitish, covered by a light yellowish-brown periostracum, middle whorls somewhat darker than apex and body-whorl; slightly rimate or excavated at the umbilical area; whorls 4½, rapidly increasing, with very fine arcuate lines of growth, otherwise smooth, with two keels, a rather thick and prominent one at the periphery and a less developed one situated below the suture of the latter part of the last whorl; aperture sub-oval, very oblique; peristome continuous, rather thick, whitish and shining.

Maj. diam. 5½; alt. 5 millim.

Hab.—Yunnan-fu Lake, Yunnan.

The nearest form known to me is *Jullienia costata*, Poir., but that species is easily separated by its less globular form and spiral costae.

ON A COLLECTION OF LAND SHELLS FROM GEBI ISLAND, MOLUCCAS, WITH DESCRIPTIONS OF NEW SPECIES.

By HUGH FULTON.

(Plate iv.)

The species noted in this paper were collected by Mr. John Waterstradt on the island of Gebi, which is situated about midway between Waigiou and Halmahera Islands.

1.—Xesta aulica, Pfr.

2.—Planispira kurri, Pfr.

Numerous varieties occur of this species and the variation in size is remarkable; the following are the dimensions of two extreme forms:—

A. Maj. diam. (including peristome) 21; alt. 10 millim.

B. „ „ „ 30; „ 13 „

3.—Papuina unicolor, Pfr.

Helix unicolor, Pfr.: Proc. Zool. Soc., 1845, p. 64.

Ampelita unicolor, Pils.: Tryon's Man. Moll., vol. vi, p. 37, pl. 5, figs. 74—76.

An interesting discovery, as the habitat of this species was hitherto unknown, and owing to its similarity in form to some species of *Ampelita*, it had been thought by some to be from Madagascar.

4.—Papuina fallax, n. sp.

Pl. iv, figs. 6, 7.

Shell somewhat depressed, narrowly perforate, rather thin, apex dark brown, following whorls yellowish-brown, the last being darker in colour and subangulate at the periphery which is ornamented by a very narrow dark brown spiral band; umbilicus encircled by a yellowish patch; suture well defined by a whitish line; whorls 5, moderately convex, slowly increasing, last descending; aperture sub-oval, grey within; peristome moderately expanded, slightly reflected, dilated at point of insertion, almost covering the umbilicus.

Maj. diam. 27; alt. 19 millim.

This species has a remarkable resemblance both in form and colouration to the Cuban *Cepolis (Coryda) alauda*, v. *strobilus*, Fér. Quite distinct from any other species of Papuina known to me, the nearest being *P. labium*, with which, however, it cannot be confused.

5.—Albersia subsphoerica, n. sp.

Pl. iv, figs. 8, 9.

Shell subglobose, moderately solid, imperforate, medium dark brown with a darker narrow spiral band bordered below by a similar one of a yellowish colour situated a little above the periphery of last whorl and continued for a short distance at the suture; covered throughout by oblique rows of close-set hair-scars; whorls 4½, moderately convex, rapidly increasing, last shortly descending; aperture subcircular, outer band showing faintly through; peristome slightly expanded, broadened at point of insertion, a circum-umbilical dark patch, inner columellar edge white, ending abruptly below with a rather acute angular projection.

Maj. diam. 24; alt. 17 millim.

Near *A. pseudocorasia*, Strubell, but slightly more globose, the whorls are more closely coiled and the hair-scars are more numerous. The lines of growth in *pseudocorasia* are rather conspicuous at the suture, giving it a somewhat crenulated appearance, whereas in *subsphoerica* the suture is simple.

Of the three specimens before me one does not show the tooth-like projection noted in the description of the type, and the third specimen only shows it very faintly.

6.—Leptopoma gebiensis, n. sp.

Pl. iv, figs. 10, 11.

Shell umbilicated, subconic, moderately thick, colouration variable, generally whitish ground with reddish-brown spiral bands which are often more or less interrupted, last whorl with eight white striae, one at the periphery, four above and three below, between these are numerous much finer striae; whorls 5½, moderately convex, last rather acutely keeled in front; aperture circular, spiral striae showing through the interior; peristome expanded, double (in adult specimens), inner edge more or less exserted, white, columellar portion narrow, broadening at lower part; operculum normal.

Maj. diam. 17; alt. 15 millim.

„ 14; „ 12 „

Similar in form to *L. crenilabre*, Strubell, but that species is much smoother, the peristome is less oblique and the last whorl is rounded in front, not moderately keeled as in *gebiensis*.

A H Reginald del et lith

A.S. Huth, imp

NEW SPECIES OF LAND AND FRESHWATER SHELLS

NOTE ON LEPTOPOMA CRENILABRE, STRUBELL.

By HUGH FULTON.

(Pl. iv. figs. 12, 13.)

The above species was described by Bruno Strubell in the Nachr. d. d. Malak. Gesell., 1872, p. 48. In Martini & Chemnitz, 1902, pt. clxx, p. 412, pl. 52, figs. 1—5, Kobelt describes and figures a shell purporting to be Strubell's *crenilabre*.

Having had the opportunity of examining the type specimens of *crenilabre* from the Strubell Collection, I find that they do not agree with Kobelt's description and figures, but do agree with the original description.

L. crenilabre is very near *L. vitreum*, but is of a thicker substance, and readily distinguished by the back of the peristome being more or less reticulated. Strubell describes it as being smooth, but by the aid of a lens one can just discern several spiral keels standing out from the usual microscopic spiral striae.

The shell figured by Kobelt is probably a variety of *halmahericum*, Strubell.

I give a figure of the type specimen (Pl. iv, fig. 12), and of a banded and larger specimen (fig. 13) from the collection of the late Bruno Strubell.

EXPLANATION OF PLATE IV.

Fig.	1.	*Melania aeruginosa*, n. sp.
Fig.	2.	*Melania dulcis*, n. sp.
Fig.	3.	*Melania fortitudinis*, n. sp.
Fig.	4.	*Melania lauta*, n. sp.
Fig.	5.	*Jullienia carinata*, n. sp.
Fig.	6, 7.	*Papuina fallax*, n. sp.
Fig.	8, 9.	*Albersia subsphaerica*, n. sp.
Figs.	10, 11.	*Leptopoma gebiensis*, n. sp.
Figs.	12, 13.	*Leptopoma crenilabre*, Strubell.

ON CERTAIN DEPOSITS OF SEMI-FOSSIL SHELLS IN HAMAKUA DISTRICT, HAWAII, WITH DESCRIPTIONS OF NEW SPECIES.

By H. WETHERBEE HENSHAW.

(Plate v.)

The island of Hawaii, the youngest as well as the largest of the Hawaiian group, has received comparatively little attention from conchologists. This neglect no doubt is in no small degree due to the fact that the *Achatinellidae*, which have chiefly excited the interest of students, are but sparingly represented on Hawaii, there being but three species, and these by no means the most conspicuous of the group. The discovery, therefore, of deposits of fossil, or rather of semi-fossil, shells in the Hamakua district, containing a number of undescribed species, is not without interest. Before adverting to the deposits, a brief description of the region is necessary to a proper understanding of their relation to the present fauna.

The districts of Kohala and Hamakua comprise the northern end of the island of Hawaii. This is by far the oldest part of the island, and probably it had grown ancient before the fires that resulted in the upbuilding of the huge mountain mass of Mauna Kea to the south, and the still more recent Mauna Loa, were yet kindled. With little doubt then the northern end of Hawaii was first to receive its fauna from the much older islands to the north, and it in turn served as a nursery for the rest of the island as its lavas were upheaved from the depths of ocean, cooled, and were slowly clothed with vegetation.*

* The extraordinary development of the *Succinidae* upon the island of Hawaii suggests the possible hypothesis that this island, the present metropolis of the group, was the first of the Hawaiian islands to receive the *Succinea* stock, and that the other islands have been successively colonized from it rather than the reverse. Even when the present comparatively extensive deforestation of the more northerly islands of the group is taken into account, the relative scarcity of the *Succineidae* upon them is difficult to understand. Dating back in origin to a vastly greater antiquity than Hawaii, the northern islands would naturally be assumed, upon a priori grounds, to have received their *Succinea* stock first; hence they should be richer in species than the comparatively recent island; the contrary is true.

There is, however, one important factor of the problem not to be overlooked. The *Succineidae* appear to have had the island of Hawaii pretty much to themselves from the very first, the comparative scarcity of other land shells there, leaving them practically without competition. Thus favoured by a comparatively free field, and with a general environment extremely favourable to their habits, the *Succineas*, though perhaps with a long start upon the other islands, having later obtained a foothold upon the Big is and may have attained their present rich development upon it in a comparatively short time.

As a factor in the development of the species of a group, time would appear to be a less important element than favourable environment and, above all, freedom from direct competition.

The principal competitors of the *Succineas* for food are the genera *Amastra* and *Leptachatina*, perhaps *Carelia*, and the *Zamitidae*. All of these, but especially *Amastra*, live chiefly upon decaying vegetation and perhaps upon the fungi found thereon. The island of Hawaii is poor in species of all these groups, *Carelia* being wholly absent, nor as a rule are any of these species strongly represented by individuals.

Upon Oahu the *Acatinellidae* proper, the *Amastras* and the genus *Auricula* have attained a development equalled upon no other island although both Maui and Molokai are greatly favoured by the former. Upon Kauai the genus *Leptachatina* has differentiated an extraordinary number of species (many yet undescribed), and this genus and *Carelia*, the latter found upon no other island, appear to have preempted the field. Thus several of the islands seem to have favoured one or two groups which, having once gained the ascendency, have been able to hold it against all molluscan competitors.

Much of the coast line of Hamakua is very precipitous, especially near Waipio Valley, the cliffs there rising sheer to a height of 600--800 feet. Formerly no doubt the forest extended clear to the brink of the cliffs, but for many years past waving sugar cane has usurped the place of the forest, ever creeping steadily upwards, until now the cane fields have reached a final limit of about 1,800 feet.

Above the present limit of the cane is a belt of forest. Most of this has been fenced from cattle for the past twenty years to preserve the water supply, and in many places the land is as densely covered as it ever was with kukui, ohias, and with the usual variety of ferns, shrubs and plants that go to make up the Hawaiian forest. As rare inhabitants of the depth of this forest, but more abundant on its edges and in the partial openings, are found *Succinea unconspirua*, Ancey, *S. bicolorata*, Ancey, *S. kuhnsii*, Ancey, one or two others of the genus and a number of the minute species of land shells.

There are portions of this forest-belt where the timber is very thin, and here live on the ahakea (*Bobea elatior*, Gaud.), the ohias (*Metrosideros polymorpha*, Gaud.), and the koolea trees (*Myrsine lessertiana*, A. D. C.), the *Achatinella horneri*, Baldw., and the *A. hawaiiensis*, Baldw., species which seem to wholly shun the dense forest and inhabit only isolated trees where light and warmth abound. This open forest section has been invaded by the all-conquering "Hilo grass" (*Paspalum conjugatum*) which apparently is destined to materially affect the future of both the forest and the shells. It grows here most luxuriantly in a dense mass which effectually screens the earth from the life-giving sun, and smothers in its embrace all the seeds that fall from the trees above. To the presence of this grass in the open district here described, I attribute the fact, that, though fenced from cattle, there are absolutely no young trees coming forward, the probable result being the extinction, in the not distant future, of the trees and the shells inhabiting them.

Above the timbered belt just mentioned, and distant from the sea some six miles, are the so-called Waimea Plains. To the north and west are the Kohala mountains, which rise to the height of about 8,000 feet.

To-day the plains are almost entirely treeless, except here and there for scattered pua trees which form the home of the *Achatinella physa*. There still stand, however, many skeleton trunks of the ohia and koa trees, whose naked and broken branches like outstretched arms, seem raised in protest against the fate that has overtaken them and and their fellows lying on the ground. Less than fifty years ago it is said to have been impossible to ride anywhere over the present plains except by trails because of the multitude of fallen tree trunks that everywhere blocked the way. This brings the forest down to comparatively recent times, and there is no reason to doubt the generally received tradition that a century ago the present plains were covered with an impassably dense forest, a fact essential to remember in connection with the fossil remains to be described presently.

That this forest was of the usual island type is certain, and it consisted for the most part of ohia and koa together with numerous smaller trees like the pua, kopiko, ahakea, tree lobelias and many other shrubs and berry bearing trees, with the usual tangle of ieie vines and ferns.

The forest, proper, probably never extended in this region much, if any above 3,000 or 3,500 feet. Above this altitude the slopes are steeper and the soil more scanty and rocky. Here the mamani begins to be numerous, a tree which indicates a thin and poor soil, a scanty rain supply and a considerable altitude.

The region of the Waimea plains appears never to have had a large (as compared with some other parts) rainfall. In the absence of definite data it may be assumed to be not far from 40 inches at Mana on their upper border, that figure being the average for several years in the town of Waimea as given by Professor C. J. Lyons. A small rainfall would seem to be indicated also from the fact that nowhere on the plains appear marked evidences of erosion. The deep gulches which gash the windward side of the island at short intervals are on the plains conspicuous by their abence, although nowhere are they deeper and more numerous than a few miles to the north east in the rainy Kohala mountain district. The Kohala mountains in fact, seem to intercept and rob the trades of their moisture before they reach the plains. The surface of the plains is by no means flat, but is gently and in places quite steeply rolling. On their upper edge and probably on the very edge of the former forest, at an altitude of about 3,000 feet, occur the semi-fossil deposits which form the subject of this paper. The fossils have been found in two distinct localities, viz., at Mana and at Palihoukapapa. The two places, however, are only about four miles apart, and though the latter is several hundred feet higher than the former, to all intents they may be considered conchologically to be one and the same. There is, however, some difference in the character of the deposits at the two places. At Mana the shells occur in the horizontal strata, two or three inches thick, and under a deposit of about a foot of humus. The very primitive digging implements at the writer's disposal prevented anything like a thorough examination of the extent of the deposits, but the evidence all goes to show in that in no one spot are they extensive. All that were found were included within an area of a few hundred square yards, the shell-bearing strata in some spots occupying only a few square feet, in others a few squar yards.

At Palihoukapapa the deposits are, or seem to be, even less extensive, and instead of being in horizontal strata are in the nature of pockets, sometimes containing a bushel or more of shells. Over how large an area here the deposits occur there are no present means of telling.

I see no reason to doubt that the shells in both localities are entirely local in origin, and that they were swept into their present position by water resulting from local freshets. In certain favoured localities in the islands, shells

of various species occur in extraordinary abundance. In the case of the deposits in question it need be assumed only that an unusual mortality occurred simultaneously among the shells of a certain district, such as invariably follows a forest fire, and that there shortly ensued a deluge that washed the dead shells into their present abiding place. The gentle slope of the land around the deposits in both localities entirely favours this supposition.

That the shells forming the deposits cannot have been carried from any considerable distance is proven by the condition of vast numbers of the fossil *Succineas*, many of which when cleaned from dirt might almost seem to have been alive but yesterday. The steeper slopes of Mauna Kea are not more than four miles to the south west of the localities in question, but the general lay of the land, and the fact that a well defined ridge intervenes, forbids the assumption that the shells originated on the distant slopes of the mountain and were transported to their present position, even if the condition of the shells themselves did not prove the contrary.

The humus above the fossils in both localities is perfectly homogeneous, and the general absence in it of shells is especially noteworthy, indicating to the writer that the destruction of the fossils resulted from the destruction of the forest, or at any rate occurred at about the same time, the locality then ceasing, except in a small way, to be a shell producing one. Had the forest persisted after the deposition of the fossils, the humus overlying the fossils would contain evidence of the fact in the presence of shells, either of the same or of other species, which would have re-populated the forest. The grass in the neighbourhood still shelters a few small species like *Leptachatina* and *Tornatellina*, and it is probable that the genera *Pupa* and *Microcystis* are still represented here and there although none rewarded our search. Specimens of *Succinea konaensis*, Sykes, were found hard by, and the *Achatinella physa*, Newc., also is found in the neighbourhood. Dead shells of the above species were found on the surface of the ground and perhaps an inch or so below, but further down they seem to be entirely wanting.

In connection with the question of the age of the deposits, it is to be said that the humus everywhere presents the appearance of having been laid down by the natural decay and deposit of the tropical vegetation. Nevertheless, I cannot think that such is the case, but believe that most of the humus above the shells must have been washed into place subsequent to the deposit of the shells. The deposition of a foot of humus by natural decay, even in a luxuriant semi-tropical forest, must require several hundred years, and the condition of the shells generally would seem to negative any such age. It is true that in a few places the shells have been reduced to lime, all semblance of their form and character having disappeared. On the other hand, thousands of the frail *Succineas*, *Tornatellinas*, and *Pupas*, as well as many of the more substantial species like the *Amastras* and the *Achatinellas* are but slightly affected by time.

That the deposits of fossils are confined to the two localities in question is not for a moment to be believed. A well-worn trail at Palihoukapapa, and some deep holes dug by cattle at Mana, chanced to reveal the presence of the shells in these two localities; but no doubt there are similar deposits in many other places on the Waimea Plains and elsewhere in the northern end of the island. Indeed the author has heard that in the district of Kohala such deposits are by no means uncommon.

In a paper published in 1887 (Hawaiian Annual), Mr. D. D. Baldwin speaks of extensive portions of the Hamakua and Kona districts at altitudes of 3,000 to 5,000 feet, "where the soil is filled with millions of sub-fossil shells of this [Succinea] family." In a recent letter to the writer, Mr. Baldwin mentions these deposits more in detail, and states that he made several hurried trips to the region above Honakaa and in the vicinity of Waimea in the years from 1865 to 1872 and again in 1878. In all of the open country above the forest, the ground was "white with dead Succineas and probably other shells. The shells were quite evenly distributed through the light surface soil." Later, through the agency of floods, the surface shells here mentioned may have been swept into pockets and so formed deposits similar to those examined by the writer.

Indeed, in several specimens of *Succinea*, faint traces of colour are still visible, the original deep red or maroon having faded to pink. The same is true of some of the smaller shells.

In a climate like that of Arizona and in dry earth even frail shells might be preserved almost intact for several hundred years; but the climate of the Waimea plains is by no means a dry one in this extreme sense. Heavy dews are the rule all through the year, and rains are probably frequent enough to keep the humus damp all the time except in seasons of drought when it is likely to dry for a few inches only from the top. That frail shells like the *Succineas* could long be preserved in damp and porous humus, even though a foot from the surface, is not credible. All things considered, it does not seem likely that the fossil shells date back more than a century, and it is probable that they and the forest perished at the same, or nearly the same time.

As to some extent confirmatory of the theory of the recent age of the shells, the writer has recently learned that about fifty years ago, more or less, an extensive forest fire raged in this section, and this may have been the cause of the simultaneous destruction of such vast quantities of mollusca.

The following *Succineas* are believed to be undescribed species. All four are without doubt extinct in the region in question.

In examing several thousand specimens of these semi-fossil *Succineas*, one cannot fail to be impressed with the considerable diversity in shape and size of individuals, presumably of the same species. The difficulty in treating such materials consists not in the finding of new species but rather in the exercise of due restraint in naming forms evidently closely related to living

species but exhibiting greater or less differences. Living species of this group are difficult enough of determination, even with the aid of abundant material and field notes. How much greater the chances of error with only fossil material available! The author has intended to be extremely conservative in describing forms, preferring to leave a few for future describers rather than to add to the number of synonyms, already too many, in this group.

Succinea maxima, n. sp.

Pl. v, figs. 1, 2.

Shell elongate, narrow, rather thick, lines of growth fairly distinct. Spire very small, considerably less than $\frac{1}{3}$ the whole length of shell, conical, slightly produced, apex mammilliform, suture moderate. Whorls, 3; ultimate whorl very large. Aperture large, but slightly oblique, ovate, reduced above. Columella but slightly curved. Peristome simple, acute.

Long. 24, lat. 11.5 millim.; long. apert. 16 millim.

Hab.—Mana, Hamakua, Hawaii.

This species is without doubt the largest of the genus yet discovered in the Hawaiian Islands, and differs also otherwise from described forms. The axis of the shell is nearly medial, the apex forming but a very slight angle with the body of the shell. The apex is very small in comparison with the last whorl, averaging less than one-third the length of the latter. A single specimen of this species was found in the Palihoukapapa deposits, but the species abounds in those at Mana.

Succinea mirabilis, n. sp.

Pl. v, figs. 3, 4.

Shell moderately thick and firm, acutely cone-shaped with very obliquely truncated base; lines of growth distinctly marked; spire relatively large, antish, mammilliform, composed of two convex whorls with well-defined sutures; aperture rather narrowly ovate, rather less than two-thirds the length of the shell; columella decidedly curved and slightly reflexed; peristome simple, acute.

Long. 16, lat. 8 millim.; long. apert. 11 millim.

Hab.—Palihoukapapa, Hamakua, Hawaii.

As regards its shape, this shell is far the most remarkable of Hawaiian *Succineas*, living or extinct. The lower whorl spreads widely, and the aperture is so oblique to the axis that, when the shell is placed on its base, the apex makes a very acute angle. The apex is also very large as compared with the lower whorl, being contained in the latter only twice. The species appears to be only moderately abundant in the deposits.

This species bears a very remarkable resemblance to the *S. infundibuliformis*, Gould, from Tahiti.

Succinea pristina, n. sp.

Pl. v, figs. 5, 6.

Shell elongate, moderately thick (in large individuals very thick), lines of growth usually moderately marked (in some large specimens strongly so); spire produced, nearly half the length of shell, apex acute, suture moderate; whorls $3\frac{1}{2}$—4; aperture only of moderate size, narrowly ovate, but slightly oblique to axis of shell: columella moderately curved; peristome simple, acute, thin.

Long. 17.5, lat. 8 millim.; long. apert. 8 millim.

Hab.—Mana, Hamakua, Hawaii

This species differs markedly from the previous one, especially in lacking the spreading base, and in the much less oblique aperture. Its relations are much closer with the *S. protracta*, Sykes. It appears, however, to have been much larger than this species, and the shell is much thicker, *protracta* being one of the most fragile of Hawaiian *Succineas*. *Pristina* appears to be even more closely related to the *S. procera*, Gould.

One individual, considerably the largest of fifteen, measures as follows: Long. 21, lat. 11 millim.; long. apert. 13 millim.

The colouration of this species when in life probably differed much from that of *protracta*, which is brown or horn colour. A single specimen of *pristina* has retained its colour sufficiently to show that the columella and base were of a deep red or maroon like the *S. thaanumi*, Anc., and the *S. bicolorata*, Anc.

Succinea gibba, n. sp.

richness

Pl. v, figs. 7, 8.

Shell broadly ovate; lower whorl large and strongly convex; lines of growth but slightly defined: spire very short, obtuse, mammilliform, of two whorls, less than one-third whole length of shell; suture shallow and narrow; whorls 3; aperture large, broadly ovate; columella much curved, slightly reflexed posteriorly; peristome simple, acute.

Long. 20, lat. 12 millim.; long. apert. 14 millim.

Hab.—Mana, Hamakua, Hawaii.

This species seems to be quite distinct from any of the insular forms. It is chiefly remarkable for its great size and for the very marked convexity of the lower whorl.

Below is appended a complete list of the semi-fossil shells found in the above mentioned localities. Thorough investigation of the deposits and of others in the northern part of Hawaii, will no doubt add other species to the list and also reveal additional undescribed forms.

The smaller species have all been identified by Mr. Ancey from material sent him, and the author is greatly indebted to this conchologist for a list of the forms detected by him including the new species. Where Mr. Baldwin or the author are responsible for the identifications, this fact is indicated by the name in brackets.

As will be noticed the greater number of forms from the deposits are of species still existing, either on Hawaii or the others islands. The list contains representatives of most of the genera of Hawaiian land shells, and the number of genera as well as species sufficiently attest the former wonderful richness in molluscan life of this particular region.

1. Achatinella physa, Newc.
   Abounds in the deposits of Mana. Mr. Ancey is inclined to view this shell as a new variety because of its size, an idea at first shared by the author who now, however, adopts Mr. Baldwin's opinion of its specific identity with *physa*.
2. Achatinella horneri, Baldw. [Henshaw].
   Two or three individuals only from Mana deposits which are several hundred feet above the present usual range of the species.
3. *Amastra senilis, Baldw. [Baldwin]. Very abundant at Palihoukapapa.
4. * „ fossilis, Baldw [Baldwin]. Common at Palihoukapapa.
5. „ flavescens, Newc. [Henshaw]. Rare in the Mana deposits but abundant enough living at an elevation of 2,000 feet or so.
6. *Amastra conica, Baldw. [Baldwin].
7. * „ sinistrorsa, Baldw. [Baldwin].
8. *Pseudohyalinia meniscus, Anc.
9. Vitrea hawaiiensis, Anc.
10. *Punctum horneri, Anc.
11. Endodonta laminata, Pse.
12. „ nuda, Anc.
13. * „ henshawi Anc.
14. * „ hystricella, Pfr. var. paucilamellata, Anc.
15. „ lanaiensis, Sykes.
16. Nesopupa acanthinula, Anc.
17. „ sp.
18. „ baldwini, Anc. var. centralis, Anc.
19. Lyropupa perlonga, Pse.
20. * „ mirabilis, Anc var. hawaiiensis, Anc
21. * „ magdalenae, Anc. var. prisca, Anc.
22. Leptachatina henshawi, Sykes.
23. „ konaensis, Sykes.
24. „ arborea. Baldw.
25. „ simplex, Pse
26. „ sp.
27. „ imitatrix, Sykes.
28. „ sp.
29. Tornatellina newcombi, Pfr.?
30. „ cincta, Anc.
31. „ procerula, Anc.
32. „ macromphala, Anc.

33. „ extincta, Anc.
34. „ oblonga, Pse.
35. „ compacta, Sykes.
36. „ fusca, Anc
37. * „ rudicostata, Anc.
38 * „ cyphostyla, Anc.
39. *Succinea maxima, Hensh. [Henshaw]. Very numerous, Mana deposits.
40. * „ gibba, Hensh. [Henshaw]. Numerous, Mana deposits.
41. * „ mirabilis, Hensh. [Henshaw]. Not numerous in Palihoukapapa depoits.
42. * „ pristina, Hensh. [Henshaw] Comparatively uncommon in Mana deposits.
43. „ inconspicua, Anc. [Henshaw]. Abundant in Palihoukapapa deposits and also living over much of the region.
44. „ konaensis, Sykes. [Henshaw]. Abundant in Palihoukapapa deposits and also living in same region.
45. „ aurulenta, Anc. [Henshaw]. Numerous in Palihoukapa deposits Found living as yet only in Kona.
46. „ kuhnsii, Anc. [Henshaw]. Abundant in Palihoukapapa deposits; also living in same region

EXPLANATION OF PLATE V.

Figs. 1, 2. *Succinea maxima*, n. sp.
Figs. 3. 4. *Succinea mirabilis*, n. sp.
Figs. 5, 6. *Succinea pristina*, n. sp.
Figs. 7, 8. *Succinea gibba*, n. sp.

REPORT ON SEMI-FOSSIL LAND SHELLS FOUND IN THE HAMAKUA DISTRICT, HAWAII.

By C. F. ANCEY.

(Plate v.)

The shells listed in the following pages were discovered at a place called Palihoukapapa, on the Hamakua slope of Mauna-Kea, Kawaii, at an elevation of 4,000 feet. Professor Henshaw has kindly sent me some dirt in which the minute species were found. He reports other similar localities on the same island "where there are extensive deposits of fossilised land shells about a foot below the surface of humus. Nearly all the known genera of Hawaiian land shells are represented in these deposits by species, some still extant, others probably now extinct."

1.—**Pseudohyalinia meniscus**, n.sp.

Pl. v, figs. 9, 10.

Testa perdepressa, tenuissima, emortua alba, haud nitens, latissime umbilicata, sub lente striis obliquis incrementi, parum profundis, confertim exarata; spira leviter convexa vel fere plana, anfractus $3\frac{1}{2}$, regulariter sed subceleriter crescentes, convexi, sutura impressa, ultimus depressus, saepe ad aperturam leniter deflexus, infra concavus, umbilico tertiam partem diametri superante, apertura obliqua, transverse oblonga, parum lunata, margine supero antice convexi prodeunte; peristoma simplex, rectum, ad columellam haud dilatatum.

Diam. maj. $1\frac{2}{3}$, min. $1\frac{1}{2}$; alt. $\frac{1}{3}$ millim.

A more depressed shell than *P. kauaiensis*, Pfr., more distinctly sculptured and with a much larger umbilicus. It may be referable to *Charopa* rather than *Pseudohyalinia*.

2.—**Vitrea hawaiiensis**, n.sp.

Differt a *V. molokaiensi*, Sykes, et a *V. lanaiensi*, Sykes, testa magis elevata, anfractibus altius convolutis et umbilico minore; a *V. pauxillo*, Gould, cui peraffinis differt etiam testa minus depressa, paulo convexiore, colore luteo-virescente, umbilico profundiore, circulari.

Diam. maj. $4\frac{1}{3}$, min. $3\frac{2}{3}$; alt. $2\frac{1}{2}$ millim.

The above description is from recent specimens found on Olaa, Hawaii, by Mr. Thaanum. A single specimen from Palihoukapapa is referable to his species.

3.—Punctum horneri, n.sp.

Pl. v, figs. 11, 12.

Testa depressa, tenuis, orbicularis, emortua albida vel pallide fulvida, apice pallidiore laevigata excepto striis exilibus incrementi subtiliter exarata; spira convexa, parum elevata, obtusa; anfractus 4 convexiusculi, sutura impressa discreti, regulariter atque lente crescentes, ultimus convexiusculus, circa umbilicum mediocrem, quartam diametri partem paene aequantem subdepressus; aperatura subobliqua, lunata, subrotundata; peristoma acutum, haud dilatatum, marginibus distantibus.

Diam. maj. 1, min. 1; alt. ½ millim.

This minute shell is closely allied to the European *P. pygmaeum*, Drap. It is also recent on Oahu.

4.—Endodonta laminata, Pease.

Pl. v, figs. 13, 14.

Not hitherto recorded from Hawaii. The specimens of this and the following *Endodontae* retain their usual coloured brown stripes on a pale ground.

5.—Endodonta (Thaumatodon) nuda, Anc.

One or two imperfect examples seem to be referable to this species, originally described from fresh specimens from Olaa, Hawaii.

6.—Endodonta (Thaumatodon) henshawi, n.sp.

Pl. 5, figs. 15, 16.

Testa parva, orbicularis, emortua alba, vestigiis strigarum fuscarum plerumque superne praesertim eleganter lateque maculata, costulis acutis confertis (circa 45 in ultimo anfractu), radiantibus insculpta, haud nitida, aperte et mediocriter umbilicata; spira convexiuscula, parum elevata; anfractus 4—4¼ convexi, sutura impressa discreti, regulariter crescentes, ultimus cylindricus, flexuose costulatus; apertura parum obliqua, lunato-circularis, in pariete laminis duabus volventibus et in interiore basis marginis dextri denticulis 5 acutis aequidistantibus (2 superis saepe obsoletis) armata; peristoma simplex, ad columellam nullomodo dilatatum; umbilicus tertiam diametri partim haud superans.

Diam. maj. 2, min. ½; alt. 1 millim.

This is the smallest member of the group of *E. contorta*, Fér., hitherto described. The apertural armature is very much alike in *E. nuda*, *E. ringens*, and *E. contorta*. A similar species, also probably extinct, but with a larger umbilicus, was detected by the Rev. E. W. Thwing, in an extinct crater of the Kona coast; it is undoubtedly another new species which I propose to name *E. thwingi*, after its discoverer. The present one, which seems to be abundant, is respectfully dedicated to Professor Henshaw, to whom I am much indeted for the whole of the material now considered, and for valuable notes on other Hawaiian shells.

7.—Endodonta hystricella, Pfr. var. **paucilamellata**, n. var.

Pl. v, fig. 17.

Testa orbicularis, rotuliformis, convexo-depressa, aperte sed mediocriter umbilicata (umbilicus circa 1 millim. latus), subfossilis alba, late fulvo strigata, strigis in ultimo anfractu fulminatis; costulis acutis, subarcuatis, dehinc flexuosis ornata; spira convexa, parum elevata, apice planato; anfractus 5 convexi, regulariter crescentes, sutura perimpressa, ultimus cylindricus, in adultis supra medium ad aperturam plano-declivis: apertura obliqua, lunato-rotundata, marginibus acutis haud expansis, pariete laminis volventibus 2, *supera paulo validiore munito.*

Diam. maj. vix 5, min $4\frac{1}{2}$; alt. 2 millim.

I have not been fortunate enough to procure authentic specimens of *E. hystricella*, but refer to Pfeiffer's species some shells from Makawao, Maui. These have, however, three palatal laminae, while in the subfossil form there are more. Hence these are possibly specifically distinct, as moreover the true *E. hystricella* has not yet been found on Hawaii. However, I prefer to subordinate them to the latter, because besides the laminae there are not many differences. It is right to observe that in some allied forms the palatal laminae present in typical examples are reduced in number or even wanting in others. I am therefore confident that *Nesophila*, Pilsbry, a sectional name based on that feature, has no value whatever, unless it may be retained for *Helix tiara*, Mighels, a large form of quite a distinct type from the island of Kauai. In general shape and contour this is much like *Stephanoda dissimilis*, d'Orb., from Chili, but the palate is furnished with small parallel and numerous revolving lirae.

8.—Endodonta lanaiensis, Sykes.

A single good specimen. Greatest diam. 4, high $1\frac{1}{2}$ millim.

9.—Nesopupa acanthinula, Anc.

Rare, but frequent in a living state in *Oahu*, *Hawaii*, and probably other islands.

10.—Nesopupa, sp.

A single broken specimen, with the teeth of *Pupa newcombi*, but larger and more elongate. A similar but smaller form is found living on Oahu and Hawaii.

11.—Nesopupa baldwini, Anc. var. **centralis**, Anc.

Also found living at Olaa, Hawaii (Thaanum). This and others mentioned in the present paper will be fully illustrated in other contributions to the malacological fauna of the Hawaiian islands actually in the press. The typical specimens, with a more produced spire of $5\frac{1}{2}$ whorls are from Molokai and Maui.

12.—Lyropupa perlonga, Pease.

The identification is somewhat doubtful, as I have never met with Oahu specimens and all those I have seen from Hawaii (Palihoukapapa, Mana, and an extinct crater on the Kona coast) are subfossil. They are, however, in fair condition and of a brown or dark colour. The description and figure given by Boettger (Conch. Mittheil., i, p. 69, pl. xii, fig. 16) apply tolerably well to these. They measure 2½ millim. in length and 1⅓ in diameter, and have 5½ whorls. The long superior palatal lamella extends on the peristome and forms, with a well developed angular fold a small, circular, nearly closed sinus. There are about 15 or 16 riblets on the last whorl.

Lyropupa perlonga and *L. costata*, Pease (= *cubana*, Dall) are, I think, the only dextral forms of the group.

13.—Lyropupa mirabilis, Anc. var. **hawaiiensis**, n. var.

Pl. v, fig. 18.

Differt a typo (ex montibus "Waianae" insulae Oahu) testa plerumque paulo majore, robustiore, costulis pallidis, dente lamelliformi infero in fauce aperturae magis valido et elongato; anfract. 6.

Long. 2½, diam. 1½, long. apert. ¾ millim.

There are twenty or twenty-two costulae on the last whorl, while in the type specimen there are about twenty-two to twenty-four, and there is no trace of a pale ill-defined zone on the last whorl. The angular lamella is weakly developed and scarcely produced, in fact reduced to a mere tubercle.

14.—Lyropupa magdalenae, Anc. var. **prisca**, n. var.

Pl. v, fig. 19.

This form agrees pretty well with Boettger's figure of *Pupa lyrata*, Gould, (Conch. Mitth., i, p. 61, pl. xii, fig. 17), but I do not think it may be taken as the true *L. lyrata*. Numerous sinistral species and forms, all very much alike, have been shown to exist on the various islands of the Hawaiian group, and one of these, from Olaa, I have referred to *Pupa lyrata*, although I am by no means certain of the identity. Gould's description should equally be applied to other things, but not to species with a strong angular fold such as this. The diagnosis of the subfossil specimens of Palihoukapapa is as follows:

Differt a typo (ex Palama ins. Oahu) habitu plerumque magis cylindrico, costis validioribus, albescentibus, zonula pallida conspicua in parte superiore anfractus ultimi et rima umbilicari minus aperta.

Long. 23, lat. 12 millim.

I observed about 15 to 17 ribs on the last whorl, while I counted about 15 in the examples of the typical lot from Oahu. There are 14 in number in another new species detected at Olaa, Hawaii (*L. dathyotula*), a form in which the upper palatal lamella does not reach the outer edge of the peristome. In *L. lyrata*, or rather the one I ascribe to *lyrata*, there are 12 strong distant

ribs on the last whorl; its palatal folds are very close to each other, the most deeply seated (the inferior) beginning near the end of the superior. Besides, there is a very slight point-like denticle far within the base.

15.—Achatinella physa, Newc. var. **procera,** Anc.

I have not seen good full-grown examples, but refer, with some doubt, a very young shell to this.

Mr. Sykes has changed the well-known name *A. physa*, Newc., to *confusa*, Sykes, because he supposed *A. hawaiiensis*, Bald., to equal the true *physa*. 'Mr. Baldwin writes that his *hawaiiensis*, was discovered in a spot unexplored when Newcomb described his *physa*, hence the latter name may stand for what is generally distributed in collections, from the Kohala mountains and the Hamakua slope of Mauna-kea.

16.—Amastra senilis, Baldw.

17.—Amastra fossilis, Baldw.

18.—Amastra, sp.

A juvenile specimen, with conic spire and keeled body-whorl, probably distinct from the former species.

19.—Leptachatina henshawi, Sykes.

Probably referable to this species, although not so strongly sculptured.

20.—Leptachatina konaensis, Sykes.

21.—Leptachatina arborea, Baldw.

22.—Leptachatina simplex, Pease.

23.—Leptachatina, sp.

A puzzling form, somewhat like the Maui *L. grana*, Newc.

24.—Leptachatina imitatrix, Sykes.

25.—Leptachatina, sp.

Like the latter, but larger and with a more produced spire.

26.—Tornatellina newcombi, Pfr. (?)

27.—Tornatellina cineta, Anc.

Quite identical with typical specimens found in a living state on Maui, Oahu, and Hawaii.

28.—Tornatellina procerula, Anc.

Large examples. Also from Maui.

29.—Tornatellina macromphala, Anc.

Also from Maui.

30.—Tornatellina extincta, Anc.

Found at first subfossil in the sandy isthmus between East and West Maui. I received later fresh specimens collected at Kaupakalua, Maui, by Mr. Baldwin.

31.—Tornatellina oblonga, Pease.

32.—Tornatellina compacta, Sykes. (?)

33.—Tornatellina fusca, Anc.

One or two young specimens of this remarkable species.

34.—Tornatellina rudicostata, n. sp.

Pl. v. figs. 20, 21.

Testa oblongo-attenuata, perforata, emortua albida (statu recenti verisimiliter cornea), liris confertis acutis fere rectis, parum regularibus, in ultimo subflexuosis insigniter exarata; spira sat producta, conoidea, obtusula; anfractus 6 convexi, regulariter crescentes, sutura impressa propter plicas crenulata discreti: primi laevigati, ultimus oblongus, parum attenuatus, dorso et versus aperturam sulco mediano concentrico impressus; apertura vix obliqua, subirregulariter truncato-ovalis, in adultis, lamina parietali valida excepta inermis; columella incrassatula, arcuata; peristoma acutum, rectum, margine columellari dilatato, expanso.

Obs. Apertura in junioribus, praeter laminam parietalem plicis acutis duabus columellaribus et lamina transversa longa volventi in interiore palati armata.

Long. $2\frac{1}{2}$, diam. $1\frac{1}{4}$; alt. apert. $\frac{3}{4}$ millim.

An extraordinary species, quite unlike anything described in the genus. The general aspect is that of a very small *Leptachatina henshawi*, but the plicae are coarser and irregular. The sculpture is quite unusual in the genus. No living forms are allied to this.

35.—Tornatellina cyphostyla, n. sp.

Pl. v, figs. 22, 23.

Testa conoideo-oblonga, gracilis, laevigata, subfossilis alba, tenuis, nitida, aperte sed minute perforata; spira conica, elongata, lateribus rectis, summo obtuso; anfractus 6 parum convexiusculi, regulariter crescentes, sutura lineari, appressa discreti, ultimus oblongus, subattenuatus; apertura distincte obliqua truncato-ovalis, lamina unica volventi validiuscula in pariete armata; columella regulariter arcuato declivis, subincrassata, inermis; peristoma simplex, acutum, rectum, margine extero post insertionem arcuato, columellari expanso, perforationem haud claudente.

Obs. Columella juniorum biplicata.

Long. 2¾. diam. 11/3; alt. apert. 1 millim.

A very distinct species, of regular outline. Its principal characters are the conic spire, barely convex whorls, appressed sutures and oblong aperture not at all widened below and slightly oblique. The columellar margin is gently curved and without plicae except in young specimens, and the parietal lamella is rather strong.

36.—Succinea, sp.

Related to *S. cepulla*, but more oblong, and to *S. souleyeti*, Anc., which is, I think, distinct from *cepulla*.

37.—Succinea, sp.

Allied to *S. kuhnsi*, Anc., but not quite so oblique.

38.—Succinea, sp.

Like the preceding one, but more slender and more pointed spire,

39.—Succinea inconspicua, Anc.

40.—Succinea, sp.

A single specimen of a peculiar form, next to *S. casta*, Anc. var *henshawi*, Anc., but smaller and more elongate.

41.—Succinea, sp.

This groups with *S. tetragona*, Anc., of Maui and *S. quadrata*, Anc., of Olaa, Hawaii. In most specimens there is a well marked angular shoulder on the upper of the last whorl.

Although most of the *Succineae* are probably new species, though in some instances, very near to some of the recent forms, I do not wish to name them, because they will be described and figured by Professor H. W. Henshaw.

EXPLANATION OF PLATE V.

Figs. 9, 10. *Pseudohyalinia meniscus*, n. sp.
Figs. 11, 12. *Punctum horneri*, n. sp.
Figs. 13, 14. *Endodonta laminata*, Pease
Figs. 15, 16. *Endodonta (Thaumatodon) henshawi*, n. sp.
Fig. 17. *Endodonta hystricella*, Pfr. var. *paucilamellata*, n. var.
Fig. 18. *Lyropupa mirabilis*, Anc. var. *hawaiiensis*, n. var.
Fig. 19. *Lyropupa magdalenae*, Anc. var. *frisca*, n. var.
Figs. 20, 21. *Tornatellina rudicostata*, n. sp.
Figs. 22, 23. *Tornatellina cyphostyla*, n. sp.

1. 2. 3. 4.

5. 6. 7. 8.

9. 10. 11. 12.

13. 14. 15. 16.

17. 18. 19.

20. 21. 22. 23.

A.H. Searle del. et lith. A.S. Huth imp.

NEW SEMI-FOSSIL HAWAIIAN LAND SHELLS.

CURRENT LITERATURE.

Baker, F. C.—The Molluscan Fauna of the Dells of Winconsin. Trans. Ac. Sc. St. Louis, 1904, vol. xiv, pp. 99—105.

Baker, F. C.—Notes on *Planorbis truncatus* Miles. Ibid., pp. 107—110.

The writer is of opinion, after examining several thousand specimens of *P. trivolvis* and comparing them with examples of *P. truncatus*, that the latter is the ancestral form of the former species, and not *vice versa* as he has previously stated.

Baker, F. C.—The Arrangement of the Collection of Mollusca in the Chicago Academy of Sciences. Musems Journ., 1904, vol. iii, pp. 354—360, pl. xliv.

Girty, George H.—New Molluscan Genera from the Carboniferous. Proc. U.S. Nat. Mus., 1904, vol. xxvii, pp. 721—736, pls. xlv—xlvii.

The new genera and species described and figured are: *Linipecten levanus, Pleurophorella papillosa, Clavulites howardensis*, and *Schuchertella*, n. nom., "proposed for shells having the type of structure for which the name *Orthothetes* is at present in use." Type *S. lens*, White.

Hedley, C.—The Effect of the Bassian Isthmus upon the existing marine fauna: a study in ancient geography. Proc. Linn. Soc. N.S.W., 1903, pp. 876—883.

Hedley, Charles.—Additions to the Marine Molluscan fauna of New Zealand. Rec. Aust. Mus., 1904, vol. v, pp. 86—97, figs. 14—25.

The new genera and species are: *Pleurodon maorianus; Verticipronus mytilus*, gen. and sp. nov., referred with some doubt to the *Carditidae; Schismope brevis* and *S. rosea; Incisura*, nov. gen., type *Scissurella lyttletonensis*, Smith; *Puncturella demissa, Liotia polypleura, Caecum digitulum, Couthouyia corrugata, Rissoa suteri, Eulima pavillus*, and *Leiostraca murdochi*.

Pecten aviculoides, Smith, is transferred to the genus *Cyclopecten*, *Carditella delta*, Tate and May, to *Cuna*, and *Daphnella substriata*, Suter, to *Mitromorpha*, thus adding three genera and two species new to the New Zealand fauna.

Sykes, E. R.—Description of two new species of *Melania* from the New Hebrides. Proc. Malac. Soc. Lond., 1904, vol. vi, pp. 13, 14, figs. 1,2.

The two new species are *M. morti* and *M. cingulifera*.

Sykes, E. R.—On the Mollusca procurred during the "Porcupine" Expeditions, 1869—1870. Supplemental Notes, Part I. Ibid., pp. 23—40, pl. iii.

This is an exceedingly valuable piece of work, and no one is better qualified to undertake it than Mr. Sykes.

Numerous points in nomenclature are dealt with, two new species are described and figured, viz., *Retusa marshalli* and *Cylichna obscura*, and figures are given of *C. hoernesi* (Weinkauff), *C. elongata* (Jeffreys), *Acteon globulinus* (Forbes), *Bulla striatula*, (Forbes), *Retusa lactea* (Jeffreys), and *R. excavata* (Jeffreys).

Sykes, E. R.—The Hawaiian species of *Opeas*. Ibid., pp. 112, 113, figs. 1—4.

Figures of *O. juncens* (Gould), *O. pyrgiscus* (Pfr.), and descriptions and figures of *O. henshawi*, n. sp., and *O. prestoni*, n. var. *hawaiiensis*.

Sykes, E. R.—On the Polyplacophora. In Herdman, Report . . . on the Pearl Oyster Fisheries of the Gulf of Manaar. Part I, Suppl. Rep. iv, pp. 177—180, pl. i. London, 4to, 1903.

The collection includes nine species. Of these, three are identified (one doubtfully) with known forms; one species of *Callochiton*, three of *Ischnochiton*, and one of *Tonicia*, are new.

Sykes, E. R.—Zoological Record, 1903, vol. xl, Div. vii. Mollusca. London: July 1904.

This invaluable work reaches us considerably earlier than in previous years, and although possibly not quite so complete as in former years, it is a great advantage to *have the same so promptly*.

So far as the general Record is concerned there are no salient alterations, but the cross references are perhaps not so complete as in previous issues.

Pallary, Paul.—Additions a la faune conchyliologique de la Méditerranée. Ann. Mus. d'Hist. Nat. Marseille—Zoologie—1903, T. viii, pp. 5—16, pl. i.

Pallary, Paul.—Quatrième contribution a l'étude de la faune malacologique du Nord-Ouest de l'Afrique. Journ. de Conchyl., 1904, vol. lii, pp. 5—58, pls. i—iii.

In this interesting memoir the author describes and figures a peculiar *Parmacella*-like shell for which the genus *Vaucheria* is established. *V. tingitana*, the type, is known from the shell only, which is dextral and larger than any known form. It is to be hoped that Mr. Pallary will ultimately succeed in finding the living animal.

Many new species of *Helix* are described and figured, as well as new species of *Limnaea*, *Valvata*, and *Melanopsis*.

Hoyle, W. E.—A Diagnostic Key to the Genera of Recent Dibranchiate Cephalopoda. Mem. and Proc. Manchester Lit. and Phil. Soc., 1904, vol. xlviii, No. 21, pp. 1—20.

What must prove a most useful aid to workers on the recent Dibranchiate Cephalopoda, has been drawn up by Dr. Hoyle in preparation for a systematic account of the recent Cephalopoda to be published in the "Tierreich" of the German Zoological Society and Berlin Academy.

Eliot, C.—On some Nudibranchs from East Africa and Zanzibar. Part III. Proc. Zool. Soc. Lond., 1904, pp. 354—385, pls. xxxii—xxxiv. Part IV. Ibid., pp. 386—406, pls. xxiii, xxiv.

The author, in these two papers, treats of the Cryptobranchiate Dorids, which are represented by 49 species of which 1 genus and 25 species are new. In examining the value of the chief points by which the sub-families and genera under consideration can be differentiated, it is pointed out that such characters as the rhinophores and branchial and the generative organs are disappointing as a means of classification; while the characters of the dorsal surface and general texture, the foot, and the mouth parts are regarded as forming a fairly good indication of relationship. The internal organs, in the author's opinion do not offer many features which serve for the purpose of classification.

Bartsch, Paul.—A new *Ashmunella* from New Mexico. Smithsonian Miscell. Coll., 1904, vol. 47, pp. 13, 14.

Ashmunella townsendi, n. sp., is most nearly related to *A. rhyssa*, Dall, but is much smaller than that form and is uniformly more strongly sculptured. Loc. Ruidoso, New Mexico.

Hyde, Ada H.—The Nerve Distribution in the Eye of *Pecten irradians*. Mark Annivers. Vol., 1903, pp. 471—482, 1 pl.

Hyde, Ada H.—The Retinal Nerve-ending in the Eye of *Pecten*. Biol. Bull., 1904, vol. 6, p. 317.

Knight, G. A. F.—A Visit to the Outer Hebrides in search of Mollusca. Trans. Perthsh. Soc. Nat. Sci., 1903, vol. 3, pp. 193—217, map.

Stenta, M.—Zur Kenntniss der Strömungen im Mantelraum der Lamellibranchiaten. Arb. Zool. Inst. Wien, 1903, Bd. 14, pp. 211—240. 1 Taf.

Zugmayer, Erich.—Über Sinnesorgane an den Tentakeln des Genus *Cardium*. Zeit. f. wiss. Zool., 1904, Bd. lxxvi, pp. 478—508, Taf. xxix.

Sassi, M.—Zur Anatomie von *Anomia ephippium*. Arb. Zool. Inst. Wien, Bd. 14, pp. 81—96, 1 Taf.

Thesing, C.—Beiträge zur Spermatogenese der Cephalopoden. Zeit. f. wiss. Zool. 1904, Bd. lxxvi, pp. 94—136, Tfn. viii, ix.

Wettstein, E.—Zur Anatomie von *Cryptoplax larvaeformis*, Burrow. Jena. Zeitschr., 1903, Bd. xxxviii, pp. 473—504. 3 Taf.

Rice, E. L.—Preliminary Report on the Development of the Gill in *Mytilus*. Ohio Nat., 1904, vol. iv, p. 51.

Drew, Gilman A.—The Anatomy and Embryology of *Pecten tenuicostatus*. Biol. Bull., 1904, vol. 6, p. 307.

Budington, R. A.—Nervous Regulation of the Heart of *Venus mercenaria*. Ibid., pp. 311, 312.

Smallwood, W. M.—Natural History of *Hamulea solitaria* Say. Amer. Nat., 1904, vol. 38, pp. 207—225, 16 figs.

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JOURNAL OF MALACOLOGY.

No. 4. DECEMBER 28TH, 1904. VOL. XI

DESCRIPTIONS OF SOME NEW SPECIES OF CINGALESE AND INDIAN MARINE SHELLS.

BY H. B. PRESTON, F.Z.S.

(Plates vi and vii.)

The species about to be described formed part of the collection of the late Mr. Hugh Nevill, who was for many years resident in Ceylon, and a portion of whose collection came into my hands upon its dispersal during the early part of the present year. Although exact localities were often not given, all the present species, with one exception, are undoubtedly from Ceylon.

Cythara nevilliana, n. sp.

Pl. vii, figs. 1, 2.

Shell subfusiform, obtuse, solid, uniformly white; whorls 5—6, convex, coarsely ribbed and spirally grooved, giving the shell a cancellated appearance; suture impressed; aperture high and narrow; columella curved, somewhat rough; peristome slightly thickened and bent inwards over the aperture, the edge being serrated by the spiral grooves.

Alt. 5 millim.; diam. maj. 2.5. Aperture, alt. 3 millim.; diam. .5.

Hab.—Ceylon.

Clathurella bullenl, n. sp.

Pl. vii, figs. 3, 4.

Shell ovate, solid, brownish lilac, or ornamented on the last whorl with a broad peripheral yellowish-white band, and on the earlier whorls with a very narrow, but distinct, band of a similar hue; whorls 8, convex, transversely ribbed and spirally grooved, giving the shell a coarsely granulated appearance; suture well impressed; aperture narrow, one third of the height of the whole shell: columella curved; peristome thickened and bent inwards.

Alt. 6 millim.; diam. maj. 3. Aperture, alt. 2 millim.; diam. .5.

Hab.—Ceylon.

Thala ceylanica, n. sp.

Pl. vi, figs. 1, 2.

Shell slender, attenuated; whorls 7—8, sculptured with closely set transverse ridges crossed by finer spiral lines, giving the shell a granulated appearance: colour pink, mottled and streaked with white and pale chestnut, the latter colour developing into a broad peripheral band on the body-whorl; aperture narrow; columella four-plaited; peristome thickened and slightly notched above.

Alt. 10 millim.; diam. maj. 2.5. Aperture, alt. 4 millim.; diam. maj. .5.
Hab.—Ceylon.

Nassa (Phrontis) siva, n. sp.

Pl. vi, figs. 3, 4.

Shell ovately conic, spirally striated, especially on the apical whorls and lower portion of the body-whorl, and coarsely ribbed throughout except on the last half of the body-whorl, where the lower portion of the ribs becomes obsolete; whorls 8—9, somewhat convex, pale brownish-yellow, ornamented with two chestnut bands; suture impressed; columella distinctly plaited, expanded and extending above into a callosity bearing a single plait near the junction of the peristome with the whorl above; peristome thickened and slightly reflexed, having five denticles just inside the aperture, the uppermost being more strongly developed than the others; aperture obliquely ovate; canal short and rather broad.

Alt. 12.5 millim.; diam. maj. 6.5. Aperture, alt. 6 millim.; diam. maj. 2
Hab.—Ceylon.

Nassa (Phrontis) gangetica, n. sp.

Pl. vi, figs. 5, 6.

Shell fusiform, spirally striate (at the base only) and coarsely ribbed except on the last half of the body-whorl, where the surface becomes quite smooth bearing only a row of tubercles just below the suture; whorls 8, fawn colour; suture impressed; columella extending into a callosity reaching to the junction of the peristome with the whorl above and bearing a plait in this region; peristome thickened, slightly reflexed having two obsolete plaits on the inner surface; aperture ovate; canal short; operculum horny, unguiform, with an apical nucleus.

Alt. 10.5 millim.; diam. maj. 4.5. Aperture, alt. 3 millim.; diam. maj. 1.
Hab.—Calcutta.

Murex (Ocinebra) sykesi, n. sp.

Pl. vi, figs. 7, 8.

Shell ovate, solid, five varicose, coarsely ribbed and cancellated on the varices, whorls 6—7; aperture oval; peristome produced; canal only

slightly recurved; the shell is of a pinkish-white colour, having a brown band just below the periphery: in many specimens the region of the canal is tinged with rose pink, but this character does not appear to be always constant.

Alt. 20 millim.; diam. maj. 13. Aperture, alt. 5 millim.; diam. maj. 3.

Hab.—Ceylon.

This species appears to be most nearly allied to *Murex* (*Ocinebra*) *nucula*, Reeve, from the Philippines, but differs in being much more oval in general shape and the canal being less recurved than is the case in that species; moreover it has only five varices on the body-whorl whereas in *M. nucula* there are six.

Coralliophila dissimulans, n. sp.

Pl. vii, figs. 5, 6.

Shell conical, exteriorly white; whorls 5—6, obliquely ribbed, the ribs in places being raised into tubercles; suture impressed; aperture ovate; columella somewhat curved, tinged with pinkish purple; canal short and curved; peristome thin, erect; interior of shell painted with a chestnut coloured band below the periphery and ending abruptly about two millimetres from the edge of the peristome.

Alt. 9 millim.; diam. maj. 6.5. Aperture, alt. 4.5 millim.; diam. 1.5.

Hab.—Ceylon.

Mucronalia birtsi, n. sp.

Pl. vii, figs. 7, 8.

Shell fusiform, rather attenuated, smooth, polished, semi-transparent white; whorls 9, convex, the apex strongly mucronated; suture slightly channelled; aperture inversely auriform; columella twisted; peristome simple.

Alt. 12.5 millim.; diam. maj. 5. Aperature, alt. 4 millim.; diam. 2.

Hab.—Ceylon.

This species appears to be somewhat closely allied to *M. philippinarum*, Sby., but is easily distinguished from that species by its more elongate form, the more transparent texture of the shell, and by the presence of the channelled suture which is not noticeable in *M. philippinarum*.

Styloptygma lacteola, n. sp.

Pl. vi, figs. 9, 10.

Shell attenuate, fusiform, polished, striated with lines of growth, transparent white, encircled with an opaque milky-white band below the suture; whorls 9–10, slightly convex, and flattened above, giving the impressed suture an almost channelled appearance; columella arched; aperture obliquely ovate; peristome simple.

Alt. 9 millim.; diam. maj. 2. Aperture, alt. 2 millim.; diam. maj. 1

Hab.—Galle, Ceylon.

The apical whorls in many of the specimens examined are tinged with bright pink, but as this is not apparent in all, it is probably caused by the presence of decaying portions of the animal showing through the somewhat transparent shell.

Mactra delicatula, n. sp.

Pl. vi, fig. 11.

Shell triangular, rather oblique, thin, equilateral, somewhat flattened, greyish-white tinged with purple deepening towards the umbonal region, striated with lines of growth, these being rather irregular anteriorly; anterior side rounded into a sharp keel; posterior end flattened, sculptured with fine striae giving a silky appearance, and produced to an obtuse angle.

Alt. 21.5 millim.: length 25.

Hab.—Ceylon.

M. delicatula var, **nivea**, n. var.

Pl. vi, fig. 12.

Shell rather smaller, somewhat more lightly striate, pure white except for a very slight tinge of purple on the umbones.

Alt. 17 millim.: length 20.5.

Hab.—Ceylon.

Mactra taprobanensis, n. sp.

Pl. vii, fig. 9.

Shell, ovate, convex, smooth, white painted with pale brown rays of irregular breadth; umbones brownish purple, small; anterior end produced, rounded, posterior end obtusely angled; interior sometimes pale brownish purple, sometimes white tinged with pale brown.

Alt. 7.5 millim.; length 10.5.

Hab.—Ceylon.

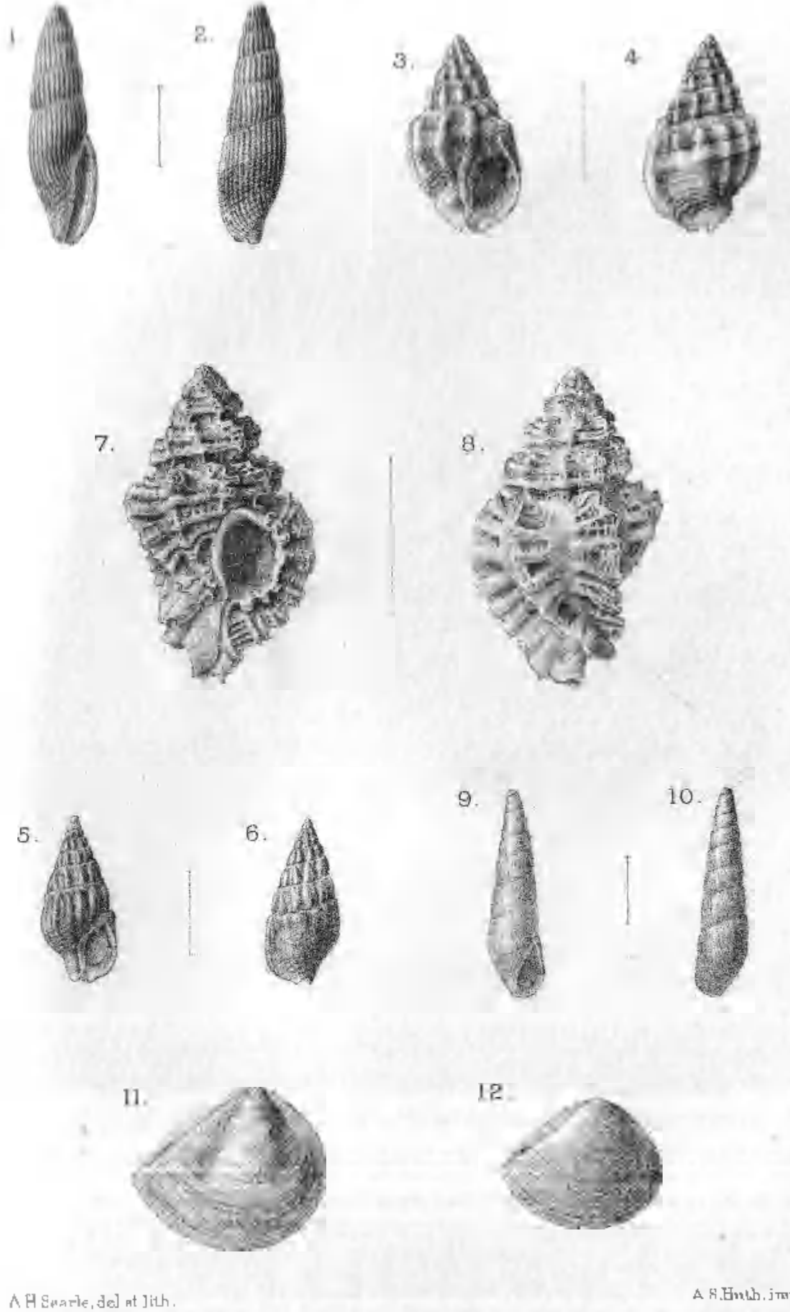
EXPLANATION OF PLATES.

Plate vi.

Figs. 1, 2. *Thala ceylanica*, n. sp.
Figs. 3, 4. *Nassa (Phrontis) siva*, n. sp.
Figs. 5, 6. *Nassa (Phrontis) gangetica*, n. sp.
Figs. 7, 8. *Murex (Ocinebra) sykesi*, n. sp.
Figs. 9, 10. *Styloptygma lacteola*, n. sp.
Fig. 11. *Mactra delicatula*, n. sp.
Fig. 12. *Mactra delicatula* var. *nivea*, n. var.

Plate vii.

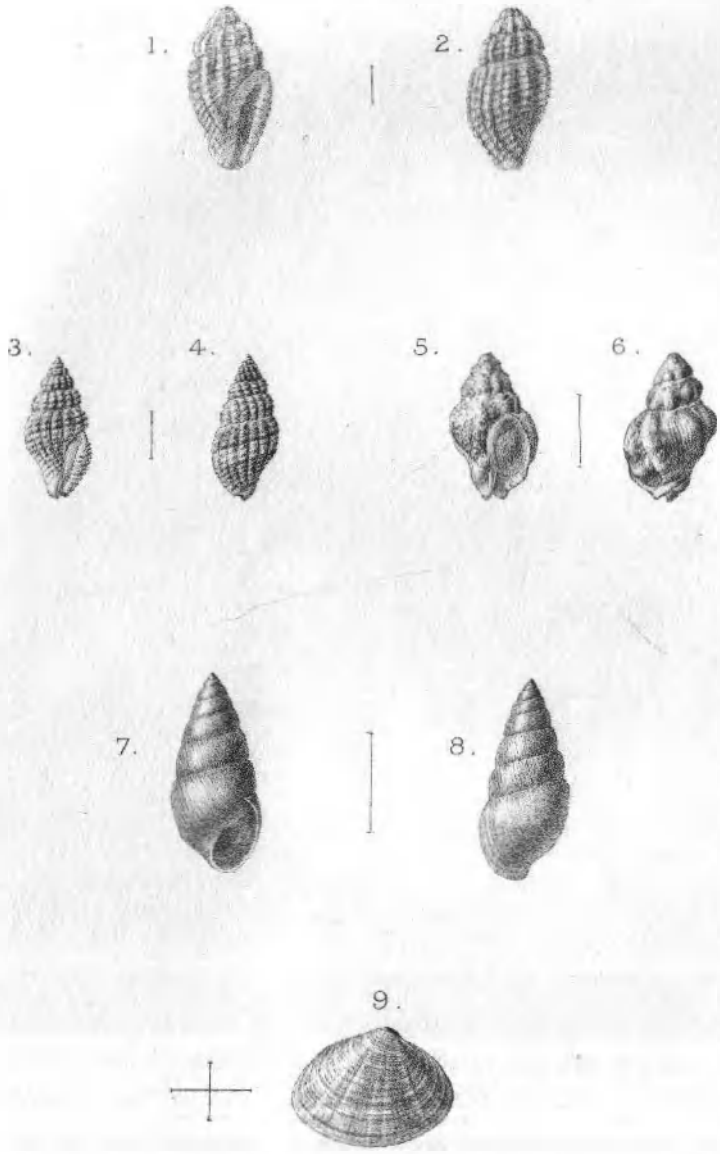
Figs. 1, 2. *Cythara nevilliana*, n. sp.
Figs. 3, 4. *Clathurella hullent*, n. sp.
Figs. 5, 6. *Coralliophila dissimulans*, n. sp.
Figs. 7, 8. *Mucronalia birtsi*, n. sp.
Fig. 9. *Mactra taprobanensis*, n. sp.



A H Searle, del et lith.

A S Huth, imp

NEW INDIAN AND CINGALESE MARINE SHELLS.



A.H.Searle del et lith. A.S.Huth, imp.

NEW INDIAN AND CINGALESE MARINE SHELLS.

DESCRIPTIONS OF TWELVE NEW SPECIES AND ONE VARIETY OF MARINE GASTROPODA FROM THE PERSIAN GULF, GULF OF OMAN, AND ARABIAN SEA, COLLECTED BY MR. F. W. TOWNSEND, 1902–1904.

BY JAMES COSMO MELVILL, M.A., F.L.S.

(Plate viii.)

I venture to offer another short instalment of descriptions of *Gastropoda* from the Persian Gulf and contiguous seas, all dredged by Mr. F. W. Townsend, during the past three years (1902—1904).

His last consignments come principally from Dabai, in the Persian Gulf proper, a locality that proved extremely rich, especially in Pelecypoda, though most of the Mollusca obtained had already been catalogued as found elsewhere in the neighbourhood.

But the majority of the following, it will be noted, come from the one almost inexhaustible station already descanted upon in previous papers.[1] This material (excepting as far as the Scaphopoda and Pelecypoda are concerned) is now thoroughly worked out, and it is hoped that a list may be eventually drawn up of all the many forms found in it, as the results are believed to have been rarely, if ever, eclipsed by any previous single haul of the dredge.

Aclis thesauraria,[2] n. sp.

Pl. viii, fig. 1.

A testa minutissima, obtecte umbilicata, ovato-fusiformi, delicata, alba, anfractibus 9, quorum 3½ apicales, caudati, omnino laeves, pervitrei, nitentes, caeteris apud suturas impressis, spiraliter acuticarinatis, ultimo et penultimo quatuor, antepenultimo, tribus carinis praeditis, interstitis laevibus, superficie haud nitente, apertura rotunda, peristomate paulum expanso, incrassato, super umbilicum et apud basin columellarem squarrose effuso.

Long. 2.50, lat. 1 millim.

Hab.—Gulf of Oman, lat. 24° 58′ N., long 56° 54′ E., 156 fathoms.

Very small, but wonderful in its perfection of form and sculpture. The apical whorls are almost caudate, three to four of almost uniform narrow build, quite smooth and glossy, the remainder being uniformly acutely keeled. The thickened peristome with a squarish extension of the columellar base half hides the narrow umbilicus.

In sculpture it shows kinship with *A. ascaris*.

1. Ann. & Mag. N. H., 1904, ser. vii. vol. 12, p. 565; Proc. Mal. Soc., vi. p. 51; ibid., p. 150.
2. *Thesaurarius*, treasured.

Rissoina (Phosinella) phormis,[a] n. sp.

Pl. viii, fig. 2.

R. testa parva, ovato-oblonga, alba, solidula, anfractibus 6—7, quorum apicales 2, vitrei, perlaeves, caeteris apud suturas impressis, undique dense clathratulis, interstitiis squarrosis, apertura oblique ovata, peristomate incrassato extus aspero, intus laevigato, columella obliqua, simplice.

Long. 3.50, lat. 1.50 millim.

Hab.—Gulf of Oman, lat. 24° 58′ N., long. 56° 54′ E., 156 fathoms.

But few examples of a small cancellately whorled *Rissoina*, smaller than any species of the subgenus *Phosinella* that occur in the same seas. All seem dead shells, but in all probability the shell would be colourless in life.

Ethalia carneolata, Melv.

var. **rubrostrigata**, nov.

Pl. viii, fig. 3.

E. testa cum forma typica convenit, sed omnino laevigata, nitida, perobscure anfractum apud ultimum bivittata, undique longitudinaliter rubris flammis et lineis pulcherrima ornata.

Hab.—Dubai, Persian Gulf.

A very few specimens dredged in 1904 at the above locality, differing mainly in painting from the original type of this species, but so remarkable and conspicuous is this form, that it is considered worthy of being specially singled out under a varietal name. For description of *E. carneolata*, vide Mem. and Proc. Manch. Soc., No. 7, p. 19, pl. vii, figs. 25, 26.

Omphalius collingei, n. sp.

Pl. viii, fig. 4.

O. testa crassa, mediocri, conica, nigrobrunnea, anguste et profunde umbilicata, anfractibus 6, quorum apicales 1½ laeves, informes, vitrei, caeteris spiraliter granocostatis, costis ad regionem anfractuum superiorem juxta suturas duabus praecipue majoribus nodulorum ordinibus decoratis, nodulis nitidis, rotundis, laevibus, infra, antepenultimo et penultimo binis, ultimo tribus gemmarum ordinibus usque ad peripheriam praeditis, carina peripheriali crassa, ordine noduloso duplicato, regione basali, circa umbilicum sex ordinibus nodulorum parvis, symmetricis, aequidistantibus, apertura trapezoide intus margaritacea, labro angulato, area columellari infra umbilicum bi vel tricalloso, callo albo, nitente.

Alt. 15, diam. 16 millim.

Remarkable in its resemblance to certain South American *Omphalii*, e.g. *O. 4-carinatus* and *4-costatus*, Wood, of which it is the Eastern exponent. It may be distinguished by its blackish-brown colour, thickened substance, and neat concatenaton of variously sized rows of spiral noduled gemmae, the

[a] *Ῥαμμὸς*, a basket.

larger rows just below the sutures, and towards the centre of the whorls, and likewise very much expressed in thickness with doubled rows of nodules, at the periphery on the last whorl. At the base, concentrically around the umbilicus are spirally ranged six uniform rows of small nodules.

I venture to dedicate this species to Mr. W. E. Collinge, as a very slight mark of esteem and appreciation of his unwearied labours in the cause of Malacology.

Since describing the above, another specimen has come to hand, from a second station in the Persian Gulf, through the medium of Miss M. Lebour.

Turritella illustris, *n. sp.*

Pl. viii, fig. 5.

T. testa gracili, attenuata, delicata, alba, violaceotincta, vel pallidissime brunnea longitudinaliter indistinctis flaminis decorata, anfractibus 17, quorum apicalis parvus, laevis, caeteris apud suturas multum impressis, spiralite acuticarinatis et tornatis, carinis irregularibus, majoribus cum minoribus alternantibus, anfractus apud supernos 5, tribus ultimis 7, praeditis, apertura ovato-trapezoide, labro tenui, paullum ad basim effuso, columella paullum incrassata.

Long. 2.25, lat. .55 unc.

Hab.—Dabai, Persian Gulf.

An elegant species, its nearest congeners being firstly *T. flammulata*, Kiener, from West Africa, which it resembles in its spiral ornamentation, and likewise, to some degree, in the pale flame-like blotches on, especially the upper, whorls: this is however, a more delicately moulded shell. And also to *T. rultoni*, Melv., also from the Persian Gulf, it bears a close resemblance, but differs in the more irregular carinations, pale colouration, and the spiral blotches, from its congener, which is always unicolorous white.

To Mr. Edgar Smith I am indebted for pointing out the salient characteristics of this species.

Eulimella aeaea,[4] *n. sp.*

Pl. viii, fig. 8.

E. testa gracillima, attenuata, irregulari, alba, laevi, parum nitida, anfractibus ad 8, *quorum apicalis ipse externe revolutus et inversus, huic proximo* paullum abnormi et irregulari, caeteris laevibus, ad suturas rotunde impressis, apertura oblonga, labro ad basim paullum effuso, columella fere recta.

Long. 4, lat. 1.50 millim., sp. maj.

„ 2, „ 1. „ sp. min.

An abnormally whorled and formed shell, most akin, so far as the inhabitants of the Persian Gulf are concerned, to *E. gedrosica*, Melv., but the revolute apical whorl is more strongly developed, and the surface perfectly smooth throughout, with no sign of spiral striation. The smallest example before me has the mouth in the greater state of perfection, this exhibiting the normal Eulimelloid character.

[4] Αεαεας, magical or abnormal.

Odostomia dorica,[5] n. sp.

Pl. viii. fig. 9.

O. testa ovato-fusiformi, solidula, crassa, alba, anfractibus 7, quorum apicales 2 heterostrophi, vitrei, excavati, laeves, caeteris apud suturas canaliculatis, gradatis, duobus supernis longitudinaliter undique multicostulatis, costulis arctis, tribus ultimis laevibus, apertura fere rotunda, intus spiraliter striata, labro ad basim crassiore, plica columellari forti.

Long. 4, lat. 2 millim.

Hab.—Persian Gulf, Maskat, 15 fathoms.

A solid incrassate species, somewhat rude in build, columella very strongly once plaited, whorls very excavate at the sutures, scalate, the apex glassy and heterostrophe, while the two or three next uppermost whorls exhibit longitudinal riblets, the remaining whorls being quite smooth.

Oseilla faceta, n. sp.

Pl. viii, fig. 10.

O. testa pergracili, angusta, alba, delicata, anfractibus 8—9, quorum 2 apicales, heterostrophi, vitrei, laeves, caeteris arcte spiraliter acuticarinatis et et tornatis, carinis duabus apud supernos, tribus apud antepenultimum et penultimum, ultimo anfractu ad sex carinas, superficie interstitiali laevigata vel obscure sub lente alveata, apertura ovato-oblonga, labro tenui, columella fortiter uniplicata.

Long. 3 50, lat. 1·50 millim., sp. max.

„ 3 „ 1 „ sp. min.

Hab.—Gulf of Oman. Lat. 24° 58′ N., long. 56° 54 E., 156 fathoms.

At first deemed an attenuate variety of *O. indica*, Melv.,[6] a not infrequent species in these seas, this proposed new form differs in its far more graceful and uniformly narrowed contour, more oval aperture, and stronger columellar plica. Were it not for the presence of this last feature, indeed, it might be considered a *Cingulina*, near *C. isseli*, Tryon, which is very abundant in many parts of the North Arabian Sea. *Iravadia trochlearis*, Gould, a Rissoid, likewise has a strange superficial resemblance to this alliance of *Pyramidellidae* in these seas, as we have already mentioned.[7]

Oseilla jocosa, n. sp.

Pl. viii, fig. 11.

O. testa minuta, ovato-conica, alba, anfractibus 5—6, quorum 2 apicales heterostrophi, vitrei, in proportione magni, caeteris tri-, ultimo anfractu sex vel septem carinulatis, carinis paullum obtusis, superficie interstitiali sub lente

5. *Doric*us, from its severely classic build.

6. Proc. Mal. Soc. Lond., vol. ii, p. 112, pl. viii, f. 5.

7. Proc. Zool. Soc., 1901, pt. II, p. 369.

l. pale alveata, ultimo ad peripheriam subangulato, apertura ovato-rotunda, labro tenui, angulata, columella uniplicata.

Long. 2, lat. .75 millim.

Hab.—Gulf of Oman. Lat. 24° 58′ N., long 56° 54′ E., 156 fathoms.

The smallest by far of the four *Oscillae* yet detected as occurring in this region, and of which very few specimens have come to light. It appears to me, the angle at the periphery alone will distinguish it from its congeners.

Mumiola carbasea,[8] n. sp.

Pl. viii, fig. 12.

M. testa ovato-oblonga, parum perforata, delicata, albo-lactea, papyracea, anfractibus 6, quorum 1½ apicales, globulosi, vitrei perlaeves, apice ipso depresso, caeteris gradatulis, undique tenui costatis, costis fere rectis, interstitiis arctissime spiraliter liratis, costis ultimum apud anfractum numero circiter 18, interdum ad basim fere evanidis, apertura ovata, labro tenui, columella simplice, paullum incrassata.

Long. 3, lat. 1.30 millim.

Allied to *M. spirata*, Ad., found also in the Arabian Sea; but its gradate whorls, depressed globular apex, delicate ribs, and oval mouth with simple uniplaited columella, differentiate this species from its congeners.

Eulima (Subularia) hypolysina, n. sp.

Pl. viii, fig. 13.

E. testa vitrea, aciculata, per-attenuata, delicatissima, anfractibus 8—9, undique albo-hyalinis, laevissimis, politis, ad suturas impressis, tumidulis, lateribus infra fere rectis, ultimo interdum obscure spiraliter rufozonulato, paullum producto, apertura anguste oblonga, labro superne, juxta suturas, sinuato.

Long. 3 50, lat. 1 millim.

Hab.—Gulf of Oman. Lat. 24° 58′ N., long. 56° 54′ E., 156 fathoms.

This narrow, hyaline little species, of extreme fragility and delicacy, is, as pointed out to me first by Mr. E. R. Sykes, chiefly remarkable for the rounding off, and consequent sinuate appearance of the thin, flexuous and slightly effuse outer lip, as it approaches the suture. In this respect, though not to so great an extent, it assimilates the terrestrial *Hypolysia florentiae*, M. and P., from Natal, a genus allied to *Opeas*, and the specific name is proposed from that circumstance. *E. (Subularia) bivittata*, H. & A. Ad., occurring most plentifully with it, at no stage of its existence presents the same characteristics.

8. *Cabasus*, white sail cloth, from the papyraceous texture.

Mangilia posidonia,[9] n. sp.

Pl. viii, fig. 14.

M. testa minuta, breviter fusiformi, solidiuscula, alba, angulifera, anfractibus 8, quorum $2\frac{1}{2}$ inconspicui, vitrei, laeves, apicales, caeteris apud suturas multum impressis, longitudinaliter paucicostatis, costis crassis, undique spiraliter angulato-liratis, ultimo anfractu octo liris praedito, penultimo, simul ac antepenultimo tribus, apertura anguste oblonga, labro incrassato sinu indistincto sed lato, haud profundo, columella simplice.

Long. 5, lat. 2 millim.

Hab.—Gulf of Oman. Lat. 24° 58′ N., long. 56° 54′ E., 156 fathoms.

A not infrequent species in dredged shell sand from the above locality, its nearest congener being *M. adamantina*, Melv.,[10] a more squarely formed *Mangilia*, with distinctly larger, globular, vitreous apical whorls.

Daphnella eulimenes,[11] n. sp.

Pl. viii, fig. 15.

D. testa parva, eleganter fusiformi, alba, delicata, anfractibus 7—8, quorum apicales decussatuli, caeteris leniter supra versus suturas angulatis, arcte sed irregulariter cancellatis interstitiis plus minus quadratulis, apertura oblonga, labro incrassato, sinu patulo sed nequaquam profundo, columella fere recta paullum apud basim producto.

Long. 6, lat. 2 millim.

Hab.—Gulf of Oman. Lat. 24° 58′ N., long. 56° 58′ E., 156 fathoms.

Of the same alliance as *D. nereidum* and *D. amphitrites*, M. & S., but more gracefully formed, and gently slopingly angled below the sutures. Very rare at the above locality.

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An opportunity is here taken of figuring two species from the Persian Gulf region, viz.,

Mathilda carystia (Fig. 7.).

Solarium admirandum (Fig. 6).

Both were described in Ann. and Mag. N. H., ser. vii, pp. 221—223, but owing to exigencies of space, have been, till now, left unpourtrayed.

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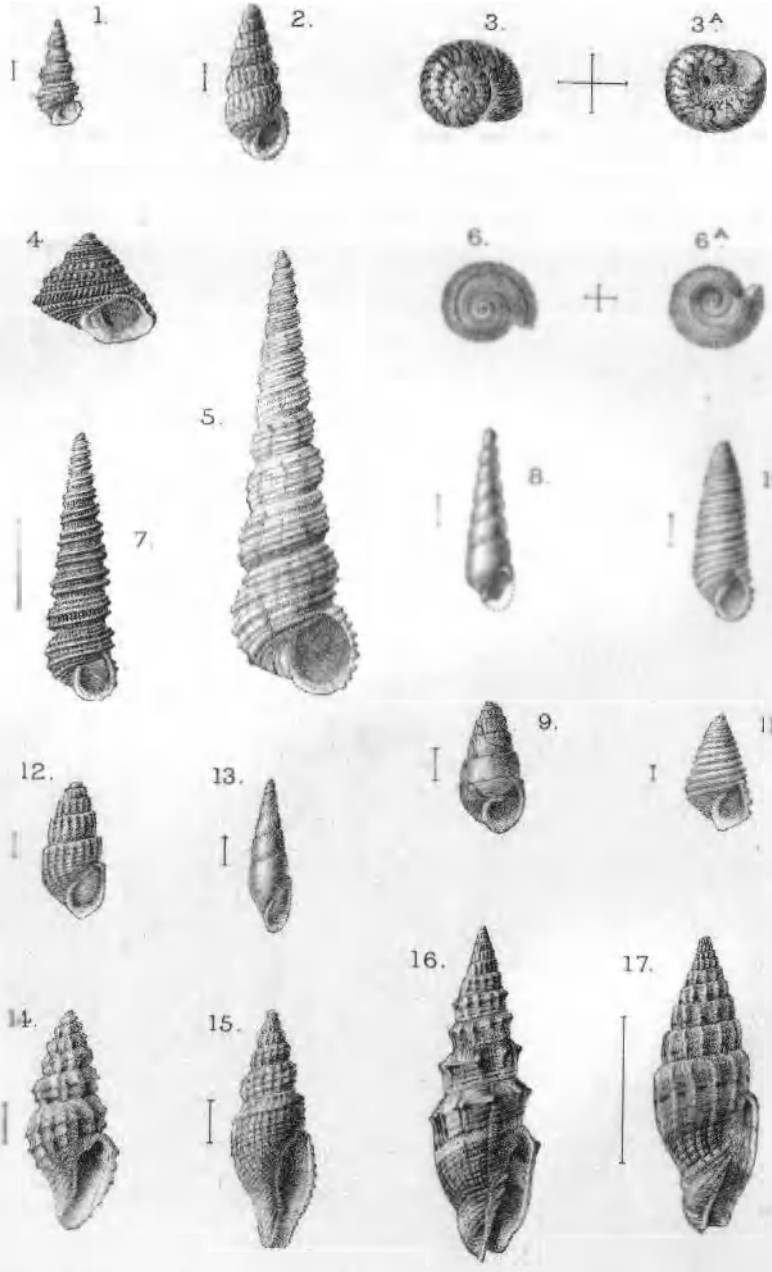
9. *Poseidon*, Neptune.
10. Proc. Mal. Soc., vol. vi, pt. III, p. 165, pl. x, fig. 18.
11. Εὐλιμένη—a Nereid.

EXPLANATION OF PLATE VIII.

Fig. 1. *Actis thesauraria*, n. sp.
Fig. 2. *Rissoina phorcis*, n. sp.
Fig. 3. *Eulalia carnicolata*, Melv. var. *rubrostrigata*, n. var.
Fig. 4. *Omphalius cellinger*, n. sp.
Fig. 5. *Turritella illustris*, n. sp.
Fig. 6. *Solarium (Torinia) admirandum*, M. & S.
Fig. 7. *Mathilda carystia*, M. & S.
Fig. 8. *Eulimella acacia*, n. sp.
Fig. 9. *Odostomia dorica*, n. sp.
Fig. 10. *Oscilla facula*, n. sp.
Fig. 11. *Oscilla jocosa*, n. sp.
Fig. 12. *Mumiola carbasea*, n. sp.
Fig. 13. *Eulima (Subularia) hypolysina*, n. sp.
Fig. 14. *Mangilia posidonia*, n. sp.
Fig. 15. *Daphnella eulimenes*, n. sp.
Fig. 16. *Mitra (Callithea) stephanucha*. Melv.
Fig. 17. „ „ „ var. *astephana*, n. var.



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NEW GASTROPODA FROM THE PERSIAN GULF.

NOTE ON MITRA STEPHANUCHA, MELV., WITH DESCRIPTION OF A PROPOSED NEW VARIETY.

By JAMES COSMO MELVILL, M.A., F.L.S.

(Plate viii, figs. 16, 17.)

Since December 1896, when the first examples of this fine mollusc were described, it has been been frequently dredged, and is now fairly generally to be found in collections.

The largest specimen we have seen, now figured, came from the neighbourhood of Muscat, in 1901 (this being the original and central habitat for the species), and measures longitudinally 45 as against 42 millimetres in the type. This individual is of a warm and cinereous-brown. The whorls are at least 15 in number, the actual apex not being quite perfect, while the spiral row of strong echinulate coronals in the upper part of the longitudinal ribs is extremely well developed. Below these, only traces of the usual transverse interrupted dark line, so conspicuous as a rule, exist, and this is followed by a plain grey and somewhat indistinct spiral band.

As a contrast to this, a remarkable form has been quite recently dredged in the locality given below, and as it possesses so many points of similarity to *M. stephanucha* it is the wisest course to deem it a marked variety, at all events till more specimens come to hand.

I therefore characterise it thus:

Mitra (Costellaria) stephanucha, Melv.

var. **astephana**,[12] nov.

Shell in general form and coloration as in the type, but much smaller, 11—12 whorled, perhaps not quite full grown, the 2½ apical, glassy pale brown, the rest longitudinally ribbed, ribs shining, smooth, number on the body whorl 13 as against 10—11 in the normal form, when mature, upper whorls interstitially spirally punctately sulcate, less deeply, but still conspicuously on the lower whorls, there being a grey central zone at the centre of the basal, as in the type, with interrupted spiral dark line, between the ribs on the five last whorls. The echinate and acutely-noduled coronal, on the other hand, round the upper portion of the ribs is well nigh or quite obsolete, giving a perfectly different character to the facies of this new variety, proposed from this circumstance, to be called *astephana*. Indeed, it seems comparable with such a species as *M. (Costellaria) nodiliyrata*, A. Ad., from the Philippines. I would add, that Messrs. Sowerby & Fulton, in their last issued elaborate catalogue of Mollusca (April, 1903, p. 18) classify *M. stephanucha* as a *Callithea*, in which subgenus *M. stigmataria* and *sanguisuga* are placed. The variety just described certainly bears a relationship to these latter, and we are not sure that *Callithea* does not therefore suit the species better than *Costellaria*; but the two sub-divisions run very closely together, and are not well defined.

Long 20, lat. 6.50 millim.

Hab.—Gulf of Oman. Lat 26° 6′ N., long. 56° 53′ E., 15 fathoms.

12. Ἀστέφανος, without a coronal.

ON SOME NON-MARINE SHELLS FROM THE AUSTRO- AND INDO-MALAYAN REGIONS.

By E. R. SYKES, B.A., F.L.S.

(Plate iv.)

The forms dealt with in the following paper have come to me from several sources, mainly however, from Herr Frubstorfer.

Thanks to the kindness of Mr. Edgar Smith, to whom I owe many thanks for his unfailing help, I have also had the advantage of seeing a series in the possession of the British Museum.

All the actual "types" are in my own collection.

Trochomorpha gulielmi, *n. sp.*

Pl. ix, figs. 11, 12.

Shell widely and openly umbilicate, depressed conoid, thin, horn colour; sculpture well-marked lines of growth, cut, on the lower surface, by numerous, close-set, microscopic spirals; suture well-marked; whorls 6½, regularly increasing, plano convex, the last whorl not descending, with an acutely angled periphery, base moderately inflated; mouth subquadrate, lip thin but slightly incrassated on the columellar margin.

Diam. max. 35; alt. (from apex to base of last whorl in front) 8; diam. max. of mouth 15 millim.

Hab — Engano.

Trochomorpha dautzenbergi, *n. sp.*

Pl. ix, figs. 13, 14.

Shell moderately and openly umbilicate, subdepressed conoid, rather thin, chestnut-brown; sculpture lines of growth, obscurely marked on the base by traces of microscopic spirals; whorls 6½, regularly increasing, flattened, the last whorl not descending and a trifle concave just above the very acute angled periphery, base flattened but a little inflated; mouth subquadrate, lip thin but slightly incrassated on the columellar margin.

Diam. max. 31; alt. (from apex to base of last whorl in front) 7 8; diam. max. of mouth 13 millim.

Hab. Engano.

These two handsome forms may be separated by the following characters. In *T. gulielmi* the shell is larger, lighter in colour, more depressed, and the whorls are slightly more swollen, and there is an absence of the concavity just above the periphery on the last whorl. The spiral sculpture on the base is also more marked, and the base itself is a little more swollen. I have adopted the names given to them in MS. by Herr Frubstorfer.

Albersia waigiouensis, n. sp.

Pl. ix, fig. 16.

The shell now under consideration appears to be widely distributed in collections under the name of *A. granulata*, Q. & G., and perhaps the most serviceable method will be to diagnose it by comparison with that species.

Shell differing from *A. granulata* in the following respects: shell more depressed in proportion to the width; colour a little darker and a white zone is present below the dark encircling band, with indications of another zone above; sculpture consisting of a very large number of minute spirals which, cutting the lines of growth produce the effect of microscopic granulation, this marking gradually fades out towards the apex, which is almost smooth; contrasted with *A. granulata* the shell differs in the presence of the dense spirals and the absence of the coarse granulation on the last whorl; the mouth in the present species is twisted at the columellar junction and has an obsolete tubercle.

Diam. max. 47 millim.

The habitat is Waigiou, and I believe all the records of *A. granulata* from the Island belong to the present species, and not to the true *A. granulata* whose habitat is Port Dorey, New Guinea.

Planispira (Vulnus, n. sect.) **endoptycha**, Martens.
var. **depressa**, n. var.

Shell somewhat more flattened.

Hab.—Waigiou.

This species was described by von Martens as a *Helix* from Batjan, Mareh, and Ternate; I have a typical specimen said to have come from Obi, and a more depressed form from Waigiou. Whether the *Dorcasia compta* of Henry Adams really belongs here, as has been suggested, it is hard to say; the type does not appear to be in the British Museum. The species is placed by Mr. Pilsbry under the genus *Planispira* in a separate group with *P. porcellana*, Grateloup. *P. endoptycha* appears to me to be well worthy of a separate sectional name, being characterised by a thin deciduous periostracum, and the remarkable indentations on the last whorl at the periphery and also on the base, but, apart from these characters resembling *Cristigibba*. To this group *P. porcellana*, and *Helix infracta*, Mrtns., probably also belong. *Vulnus* also recalls the Costa Rican *Averellia macneili*, Crosse.

Planispira (Cristigibba) gebiensis, n. sp.

Pl. ix, figs. 7, 8.

Shell moderately umbilicate, large, almost flat, slightly gibbous, crest behind the lip small, closely covered with a hairy periostracum, lines of growth obscure: whorls 5 (?), the apex broken; colour in general dark-brown on the last whorl, becoming lighter on the earlier whorls, with two white zones just

above the periphery, the lower being the broader, and a third white zone at the suture, noticeable for a whorl and a half from the mouth; mouth broadly ovate, large, lip well expanded, and slightly reflected on the outer margin, more noticeably so on the columellar margin and at the base, the external colouring of the shell is seen inside the mouth, and the colouring is produced to the edge of the lip.

Diam. max. 30; alt. (to base of lip) 12 millim.

Var. *a*. Similar to type, but the crest stronger, the colour a pale straw yellow with a white zone just above the periphery and narrower brown zone just below, with indications of another white zone just above this and at the suture; periostracum a little more noticeable.

Diam. max. 28; alt. (to base of lip) 12 millim.

Hab.—Gebi Island.

Planispira (Cristigibba) fruhstorferi, n. sp.

Pl. ix, figs. 9, 10.

Shell almost flat, horn-brown, openly umbilicated; sculpture well-marked lines of growth and a number of closely-set, small, pits, resembling the hair-scar markings seen on species of *Albersia*, and showing that when alive the shell is clothed with a deciduous hairy periostracum; whorls $4\frac{1}{2}$—5, convex, and separated by a deep suture, the last whorl is swollen and has a well-marked crest behind the outer lip: mouth descending above, ovate, with a darker brown marking just inside, lip whitish-horn colour, lightly incrassate and subreflexed, a very thin callus joining the margins.

Diam. max 13.8; alt 6.5 millim

Hab — Obi.

A small form, whose most striking characters are its uniform brown colour and its sculpture.

Obba subgranulata, n. sp.

Pl. ix, figs. 5, 6.

Shell perspectively umbilicated, depressed, with a very acute peripheral keel; pale brown, with two chestnut bands above the periphery and two below; those nearest the periphery being by far the wider; protoconch light chestnut; smooth, save for radiating lines, the residue of the shell minutely irregularly granulate, with a few scattered hairs on the last whorl, and some wrinkles behind the lip; whorls $4\frac{1}{2}$—5 flattened, the last whorl much descending at the mouth and somewhat compressed; aperture very oblique, outer margin acutely angled, lip moderately thick, expanded, reflected, white, with a fairly thick callus joining the margins.

Alt. 10; diam. max. 27 millim.

Hab.—Batjan.

Recalling *O. marginata*, Müll., but differing in the sculpture, compression of the last whorl, shape of the spire, etc. From *O. kobeltiana*, Pfr., which it appears to resemble in sculpture, the general shape, descending last whorl, etc., should suffice to distinguish the present shell. I have seen two specimens, agreeing entirely except in size. It is always difficult to say whether a sculpture of the nature of that found on the present shell is formed by close-set pits or real granules.

Papuina ecolorata, n. sp.

Pl. ix, fig. 2.

Shell trochiform, umbilicate, thin, transparent, white faintly tinged with pale yellow, protoconch large, polished, smooth, the residue of the shell lightly marked by growth lines and, very obscurely, subgranulose; whorls $5\frac{1}{2}$–6, the earlier ones somewhat convex, the later flattened, the last whorl strongly keeled at the periphery, flattened on the base, and somewhat compressed behind the mouth; aperture very slightly descending, subquadrate, white within, the lip at the upper edge of the outer margin is not reflected, but gradually becomes so towards the base, and the columellar margin is incrassated, well expanded and reflected over the umbilicus, half concealing it.

Alt. (to base of lip) 16; diam. max. 28 millim.

Hab.—Batjan.

Though this shell has no striking peculiarities still, as I have been unable to attach it to any form known to me, I have given it a name. Its only salient characters are the thin shell and entire absence of any colour pattern.

Papuina semibrunnea, n. sp.

Pl. ix, fig. 1.

Shell umbilicate, orbicular-conoid, apex somewhat acute, fairly solid, with a thin deciduous periostracum, lines of growth moderately distinct, traces of microscopic granulation are seen, chiefly on the base; apex chestnut brown, after about the first whorl and a half a white zone appears below the suture, gradually widening until the upper half of the last whorl is white and the lower (basal) half chestnut-brown; whorls $5\frac{1}{2}$, plano-convex, suture indistinct, the last whorl is subcarinate and descends considerably at the mouth; mouth elongate oval, within it is chestnut-brown with white zones at the periphery and below the suture, lip well expanded and slightly reflected, chestnut-brown marked with white just below the insertion of the columella, columellar margin slanting, well reflected and almost covering the umbilicus.

Alt. (to base of lip) 15; diam. max. 20 millim.

Hab.—Gebi Island.

Papuina lanceolata, Pfr.

var. **pulchrizona**, n. var.

Shell similar in shape to the typical form, but a trifle more elevated and the lower margin of the peristome a little more curved. Colour pattern of the base precisely as in the type, but there is a broad zone of a chestnut colour above the periphery leaving a narrow white zone both above and below it, the upper white zone being seen on earlier whorls.

Hab.—Obi.

I think this is only a colour mutation, but as seen from above, it looks quite a distinct species. My specimen is not quite so beaked as the typical form, but this is probably not a constant character.

Perrieria canefriana, n. sp.

Pl. ix, figs. 3, 4.

Shell sinistral, spire elongate and gradually tapering towards the apex, truncate, uniform dark chestnut brown in colour, somewhat polished; sculpture well marked lines of growth; whorls remaining 7, plano-convex, regularly increasing to the last whorl, very little, if at all, ascending in front: aperture somewhat pyriform, dusky brown within, peristome whitish, continuous, somewhat thickened, the outer margin a little expanded, and the columella rather twisted and truncate.

Alt. 24.5; diam. max. 6.4; alt. apert. 7.3, diam. apert. 5 millim.

Hab.—Obi.

This interesting discovery extends the range of the genus, hitherto known only from New Guinea. The present species is by far the smallest of the three described and may be separated from *P. minor*, Smith, by its darker colour, more tapering form, and by the columella being more twisted. As Mr. Pilsbry states [1] "the internal structure of the shell has not been investigated." I have broken up a specimen, which is now figured. The axis is much twisted, and I am unable to trace any armature upon it. I doubt if *Perrieria* belongs to the *Megaspiridae*; may it not be really referable to the *Achatinidae*?

Leptopoma ponsonbyi, n. sp.

Pl. ix, fig. 15.

Shell turrited, moderately umbilicated, obscurely marked by lines of growth, microscopically densely spirally striated, with a number of small filiform carinae, five on the last whorl but one, these carinae being most numerous in the umbilical region; colour horny brown with a pale zone just below the suture, this zone being marked with irregular blackish-brown blotches; whorls 5½, convex; aperture round, duplex, the outer portion very widely expanded except on the columellar margin, flattened, bending a trifle backwards and the surface a little wrinkled.

Alt. 8.3; diam. max. (with lip) 8 millim.

Hab.—Obi.

1. Man. Conch., ser. 2, vol. xvi, p. 189.

The forms at present recorded from Obi are, *latilabre*, Martens (described as a variety of *vitreum*, Less.), *megalostoma*, Mlldff., *fulgurans*, Dtz., and *altius*, Dtz. From all these the present species may be severed by its form (like *leucorrhaphe*, Martens) and the remarkable expansion of the lip. I much doubt if *L. fulgurans* really came from Obi; I have it from the same collector as from Batjan.

It gives me special pleasure to name this shell after Mr. J. H. Ponsonby, by whose knowledge I have so often profited.

Leptopoma leucorrhaphe, Martens.
var. **cingilius**, n. var.

Shell like a dwarf *leucorrhaphe*, which it resembles in colour pattern, the height, however, is only 9 in place of 12 millim.; spirals more numerous and more closely-set, there being 6 instead of 5 on the last whorl but one. The habitat is Gebi in place of Dodinga, Halmahera, from which latter I have a typical specimen (coll. Doherty).

Ameria plicaxis, n. sp.

Pl. ix, fig. 17.

Shell closely related to *Ameria obiana*, Rolle, but it may be at once distinguished by the shape of the spire, which in that species is very short and swollen, the upper whorls being very convex. In the present form the spire is drawn out and is of the usual "Physoid" shape: the columella has also the strong twisted fold characteristic of *A. obiana*.

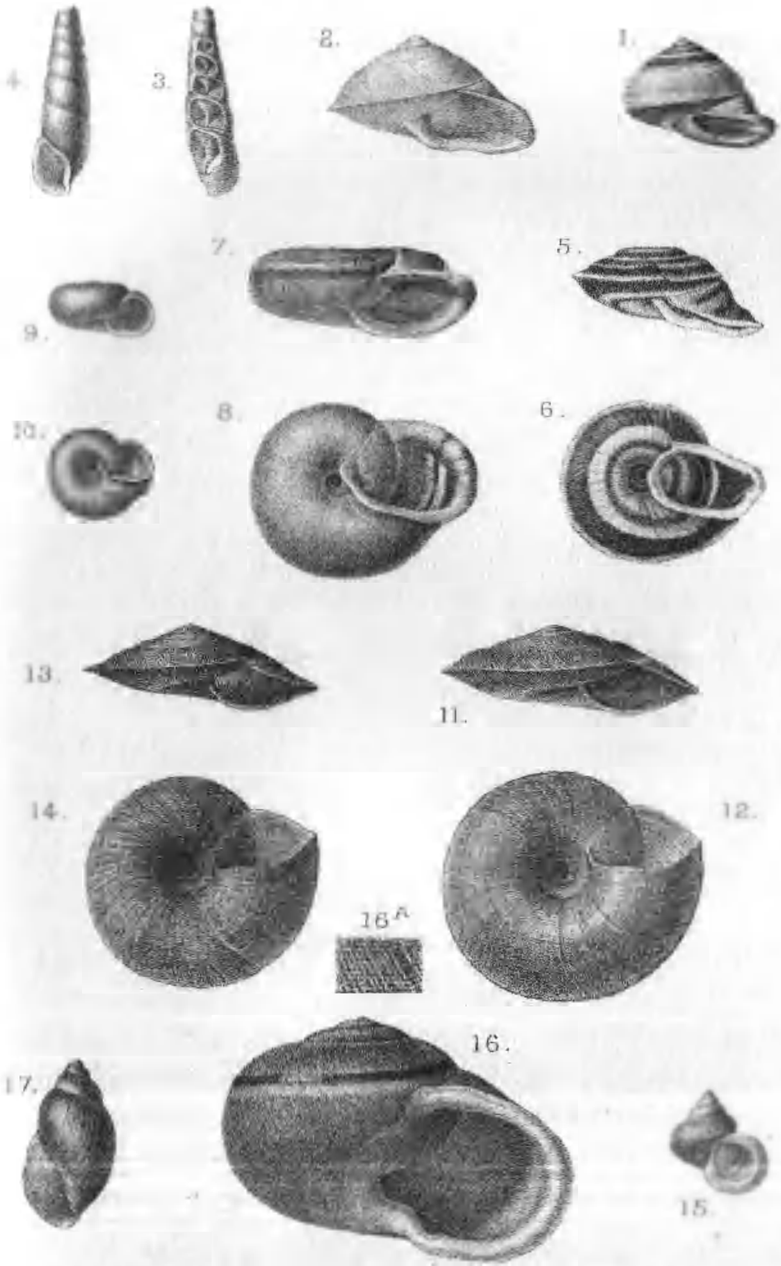
Alt. 22; diam. max. 11; alt. apert. 12; lat. apert. 5.5 millim.

Hab.—Obi.

It has been suggested to me that this may be the *Physa moluccensis* of Lesson. His description is very brief and I fancy the species will prove to be unidentifiable; it must however be sought in the fauna of Amboina. The only figure I have seen purporting to represent it, is that in the "Conch.-Cab.," which is certainly not the present species. It may also be noted that Lesson's shell was 18 millim. in height.

EXPLANATION OF PLATE IX.

Fig. 1. *Papuina semibrunnea*, n. sp.
Fig. 2. *Papuina ecolorata*, n. sp.
Figs. 3, 4. *Perricia canctriana*, n. sp.
Figs. 5, 6. *Obba subgranulata*, n. sp.
Figs. 7, 8. *Planispira (Cristigibba) gebiensis*, n. sp.
Figs. 9, 10. *Planispira (Cristigibba) fruhstorferi*, n. sp.
Figs. 11, 12. *Trochomorpha gulielmi*, n. sp.
Figs. 13, 14. *Trochomorpha dautzenbergi*, n. sp.
Fig. 15. *Leptopoma ponsonbyi*, n. sp.
Fig. 16. *Albersia waigiouensis*, n. sp.
Fig. 17. *Ameria plicaxis*, n. sp.



A. H. Searle, del et lith. A. S. Huth, imp.

NON-MARINE SHELLS FROM THE EAST INDIES.

THE HELICOID LAND SHELLS OF ASIA. CORRECTIONS AND ADDITIONS.

By G. K. GUDE, F.Z.S.

Thanks chiefly to the careful and painstaking scrutiny to which Mr. Ponsonby has subjected my lists of the Helicoid Land Shells of Asia in the two previous volumes of this Journal, a number of slips and inaccuracies have come to light, and I have thought it useful to tabulate these. Several new species have in the meantime been published, a list of which is appended.

From Mr. H. Rolle, of Berlin, I have lately received, with some other Turkestan shells, two species which appear never to have been described, and although he informs me he thinks they were published some years ago in the "Nachrichtsblatt der Deutschen Malakozoologischen Gesellschaft," as I have been unable to trace them in this publication, I append diagnoses.

Cathaica (Eucathaica) sturanyi, Rolle, n. sp.

Shell umbilicate, depressed-conoid, opaque, pale corneous above, pearly below, slightly fuscously streaked; finely striated, decussated with excessively fine spiral lines. Spire depressed, apex obtuse but rather prominent, suture deep. Whorls 5, convex, rounded at the periphery. Last whorl not descending in front, slightly dilated at the mouth. Aperture oblique, subcircular; margins convergent, united by a thin callus on the parietal wall. Peristome whitish, scarcely thickened; upper and outer margins straight, basal margin slightly reflected, columellar margin slightly dilated, but not impinging upon the wide umbilicus which distinctly shows half the penultimate whorl.

Diam. maj. 19.5, min. 17: alt. 11 millim.

Hab.—Osh, Prov. Ferghana, Western Turkestan.

Three specimens. Type in my collection.

The new species resembles in shape *C. middendorffi*, Gerstf., but that shell is thinner, translucent, more depressed, possesses one more whorl, and has sometimes a peripheral band, while the aperture is less rounded, and the lower margin is more reflected and straight. It is also more distinctly striated and strongly sculptured spirally.

Cathaica (Campylocathaica) hermanni, Mlldff., n. sp.

Shell narrowly umbilicated, conoid, pale fulvous above, whitish at the side and below, finely irregularly ribbed, decussated by microscopic spiral lines, which are more distinct near the aperture. Spire elevated, apex obtuse, suture impressed. Whorls 5—5½, rounded, tumid below, last whorl slightly de-

cending in front, a little shouldered above, and scarcely dilated at the mouth. Aperture subrotundate, margins approaching, united by a thin callus on the parietal wall; peristome white, slightly thickened; upper margin slightly ascending, straight, outer and lower margins reflected, columellar margin dilated overhanging the deep narrow umbilicus.

Diam. maj. 13, min. 11.5; alt. 9 millim.

Hab. Alexander Range, Issig Kul, Western Turkestan.

Three specimens. Type in my collection.

Compared with *C. rettereri*, Rosen, its nearest ally, *C. hermanni* is smaller and more elevated in the spire. *C. rettereri*, moreover, has a white peripheral band, is smoother and possesses pronounced impressed spirals. Another closely allied species is *C. mesoleuca*, Mart., but that shell is still smaller, with a much narrower umbilicus, more flattened whorls and a white peripheral band.

CORRECTIONS.

VOLUME IX.

Page 7, 7th line, 1st col., delete = frilleyi, Cr. and Deb.

Page 7, 6th line, 2nd col., delete constantiae, H. Ad., and insert on page 8, between Eucathaica fasciola, Drap., and E. cardiostoma, Mdff.

Page 8, 6th line from below 1st col., delete anceyi, Mdff., and insert on page 6, between Lacocathaica filippina, Ilde., and L. subsimilis, Desh.

Page 8, 4th line from below 2nd col., delete dejeana, Hde., and insert on page 6, between Lacocathaica filippina and L. anceyi, Mdff.

Page 53, 26th line, 2nd col., for Fruticicola mesoleuca, Mart., read Campylocathaica mesoleuca, Mart.

Page 100, 29th line, 1st col., for Genus Vitrea, Fitz., read genus Polita, Held.

Page 102, 33rd line, 1st col., for Vitrea aequata, Mouss., read Polita aequata, Mouss.

Page 104, 1st col., the three species placed under Vitrea transfer to Polita.

2nd line, 1st col., for patuliformis read patulaeformis.

7th line from below, 2nd col., for lenkoreana read lenkoranca.

Page 112, 9th line, for Vitrea read Polita.

22nd line, 1st col., for Genus Vitrea, Fitz., read Genus Polita, Held.

25th line, 1st col., for cyprea read cypria.

Page 115, 3rd line from below, 1st col., delete v. anprazonata, Mouss.

Page 116, 6th line, 2nd col., for Mart. read Mort.

Page 117, 2nd line, 1st col., for lenkorana read lenkoranea.

Page 118, 7th line, 2nd col., for erdelli read erdellii.

Page 120, 15th line, 2nd col., for asemnis, Bourg., read solida (Zglr.), Kob., = asemnis, Bourg., = ciliciana, Bourg.

Page 120, 27th line, 1st col., for Byzantum read Byzantium.

Page 121, 8th line, 1st col., for Genus Vitrea, Fitz., read Genus Polita, Held.

10th and 28th line, 2nd col., delete = rissoana, Pfr.

12th line 1st col., for Retinella aequata, Mouss., read *Polita aequata*, Mouss.

20th line, 2nd col., for asemnos read asemnis.

25th line, 1st col., for Genus Vitrea, Fitz., read Genus Polita, Held.

Page 122, 3rd line, 1st col, for Genus Vitrea, Fitz., read Genus Polita, Held.

8th line, 1st col., for Retinella aequata, Mouss, read Polita aequata, Mouss.

9th and 10th lines, 1st col., transfer Retinella hydatina, Rossm. and R. sorella, Mouss., to Vitrea.

17th line, 1st col., for cyprea read cypria.

Page 123, 19th line, 1st col., for Vitrea protensa, Fér., read Polita protensa, Fér.

Page 126, 22nd line, 2nd col., for Retinella aequata, Mouss., read Polita aequata, Mouss.

25th line, 2nd col., for Retinella protensa, Fér., read Polita protensa, Fér.

Page 128, 10th line from below, 1st col, for crenophila, Pfr., = muscicola, Bourg., read muscicola, Bourg., = crenophila, Pfr.

Page 129, 5th line, 2nd col., for Borug, read Bourg.

16th line, 1st col., delete beilanica, West.

18th line, 1st col., asemnis, Bourg., = solida, Zglr., read solida, Zglr., = asemnis, Bourg.

VOLUME X.

Page 9, 8th line, 1st. col., for hupensis, Hde., read hupensis, Gredl.

Page 11, 4th line, 2nd col, for ptychostyla, Mts., read ptychostyla, Pfr.

32nd line, 1st col., for Genus Microcystina, Mörch, read Genus Sesara, Alb., and with annamitica, Cr. and F., place below Kaliella bouyeri, Cr. and F.

Page 12, 22nd line, 1st col, delete promiscua, Smith.

31st line, 1st col,, for Hemiplecta danae, Pfr., read Euplecta danae, Pfr.

Page 13, 29th line, 1st col., for Coneuplecta globulosa, Mdff., read Coneuplecta möllendorffi, n.n. = globulosa, Mdff., Nachr. Bl., 1901, p. 112, not globulosa, Mdff., Nachr. Bl., 1900, p. 120.

Page 50, 4th line from below, 2nd col., for Helicarion lowi, de Morg., read Nilgiria lowi, de Morgan, fide Collinge.

32 line, 2nd col., for sakayana, de Morg., read sakaya, de Morg.

Page 52, under 9th line, 1st col., insert section Trichochlorites, Pils.

Page 55, 24th line, 1st col., delete = cryptopila, Mouss. in coll.

Page 56, 7th line, 2nd col., for helicincides, Mouss., read helicinoides v. cryptopila, Mouss.

Page 58, 24th and 25th line, 1st col., delete kinabaluensis, Smith and v. pallida, Smith, and transfer to page 56 under Trochonanina labuanensis, Pfr.

Page 59, 8th line, 1st col., for Genus Macrochlamys, Bens., read Genus Everettia, G.-A.

Page 62, 18th line, 1st col., for Mart., read Soul.

Page 83, 19th to 23rd lines, 1st col., trochus, Müll., and synonyms, stuartiae, Sowb., and nemorensis, Müll., transfer to 2nd col., under Hemiplecta.

Page 86, 3rd line from below, 1st col., for Genus Microcystina, Morch read Genus Lamprocystis, Pfr.

Page 88, under 30th line, 1st col., insert section Trichochloritis, Pils.

Page 92, 19th line, 2nd col., for unicolor (Mdff.), Dautz., = pseudolanceolata, read pseudolanceolata, Dautz., = unicolor (Mdff.), Dautz., non Pfr.

Page 97, 9th line, 1st col., for Genus Otesia, H. Ad., read Genus Conenplecta, Mdff.

ADDITIONS.

Volume IX.

Page 6, 1st col., under Euplecta dichromatica, Mor., insert Genus Conenplecta, Mdff. mecongana, Mdff., Laos.

Page 7, 1st col., after 4th line ravidula insert globosa, Preston, Shan-tung.

Page 52, under Tibet add, Euconulus fulvus, Drap. N.E. Tibet. Pliocathaica orithya v. conica, Andr. Baa Valley. P. pulveratrix v. strigillata, Andr. Wan-saong

Page 53, under Eastern Turkestan add Pliocathaica orithya v. unifasciata, Andr. Kaschgar. Under Mongolia add, Euconulus fulvus, Drap. Tarim Basin. Zonitoides nitidus, Müll. Kuldja.

Page 99, after 5th line, 2nd col., diaphora, West., insert krynickii, Andr. Kopet Dagh. After 19th line, 1st col., insert mesoleuca, Mart. Ferghana.

Page 102, under Mesopotamia add, Levantina michoniana.

Page 104, under 17th line, 1st col., Helicidae, insert Group Haplogona, Genus Pyramidula, Fitz., rupestris, Drap. Schah Rud.

Page 116, under 32nd line, 2nd col., Levantina ceratomma, Pfr., insert casta, West. In 1st col., under Zonites, Montf., add, anthesi, Kob. Pergamos, and insignis, Naeg. Gulek, Cilicia In 2nd col., under Tachea atrolabiata, Kryn., add the following varieties: intercedens, Ret. Batoum; maxima, Kob. Suchum Kaleh; decussata, Bttgr. Kutais; albolabiata, Kob.: hyrcana, Dohrn. Rescht, and malleata, Kob. Lenkoran.

Page 118, 2nd col., under Pyramidula, Fitz., add, rupestris, Drap. Gulek, Cilicia. Under Heliomanes derbentina, insert millepunctata, Bttgr.

Page 119, 1st col., under Jacosta rozeti, Mich., insert subcalcarata, Naeg. Kissik.

Page 120, under 19th line, 1st col., atrolabiata, Kryn., insert v. intercedens, Rer. Trebizond. Under 23rd line, 1st col., ainophila, Bourg., insert triangula, Naeg. Eski Schehir. Under 5th line, 2nd col., v. taurica, Kryn., insert salisi, Mab. Lebanon. Under 14th line, 2nd col., v. anatolica, Kob., insert v. trojana, Kob. Trojad, and v. libanica, Kob. Lebanon. Under 15th line, 2nd col., solida, Zgltr., insert v. ionica, Mart. Gulek. Under 22nd line, 2nd col., pathetica, Parr., insert pomacella v. attalus, Kob. Pergamos. Under 28th line, 2nd col., issica, Kob. and Rolle, insert *blumi, Kob. Cilicia.* Under 34th line, 2nd col., escherichi, Bttgr., insert nucula v. merssinae, Kob.

Page 122, under Kalymnos, after Levantina spiriplana, Oliv., add v. valentini, Kob.

Page 126, after 6th line, 1st col., v. cypria, Kob,, insert cornarae, Kob.

Page 127, under Heliomanes derbentina insert millepunctata, Bttgr.

Page 129, under Helicogena add, dickhauti, Kob.? Palestine, and pseudopomatia, Kob. Cherkli.

VOLUME X.

Page 13, 2nd col., under Helicarion siamensis, Haines, insert Genus Microparmarion, Simr., bruneopallescens, Cllge., annamica, Cllge. = andamanica, Cllge. Mekong Valley.

Page 50, under Perak add, Damayantia minima, Cllge.

Page 52, under Nawng Chik add, *Euplecta bijuga, Stol., Macrochlamys* splendens Phil., Dyakia salangana v. martensi, Cllge., Hemiplecta sakaya, de Morg., Nilgiria lowi, de Morg., Ariophanta janus, Chemn., Parmarion malayana, Cllge., Trochomorpha timorensis, Mart., Sitala infula, Bens.

Page 57, under 20th line, 1st col., v. atrofusca, Mart., insert v. annectens, *Mart.* In 2nd col., under Damayantia, Issel, add, simrothi, Cllge., rugosa, Cllge.; under Parmarion, P. Fisch., add, shelfordi, Cllge.; under Collingea, Simr., eranna, Cllge.

Page 58, under 7th line, 2nd col., martensi, Bttgr., *insert v. capistrata,* Mart. Under 16th line, 2nd col., v. angulata, Fult., insert v. obliquata, Mart. Under 34th line, 1st col., quadrivolis, Mart., insert semiquadrivolvis, Mart.

Page 59, under 23rd line, 2nd col., inquieta, Dohrn, insert brachystoma, Mart. Under 29th line, 2nd col., v. everetti, Fult., insert waterstraati, Rolle, *and weyersi, Dautz*

Page 61 2nd col., bottom of page, insert h. 2. Doat Island. Genus Everettia, G.-A., consul, Pfr., and jucunda, Pfr.

Page 90, 1st col., bottom of page, insert a. 2. Gobi. Xesta aulica, Pfr. Planispira kurri, Pfr. Papuina unicolor, Pfr., = Ampelita unicolor, Auct., P. fallax, Fult., and Albersia subsphaerica, Fult.

Page 92, after 3rd line, 2nd col., kurri v. obiensis, Dautz., insert Subgenus Cristigibba, Can. albopicta, Sykes.

Page 98, add to Index, Bunguran. E. l. 1. Doat Island. E. k. 2. Dwars in de Weg. D. f. Gebi. H. a. 1. Mengalun (E. f.). Roma. G. k. 2 (see Vol. X, p. 130).

NOTE.

Note on Two varieties of Arion subfuscus, Drap. Mr. H. Overton has recently submitted to me for identification two examples of *Arion subfuscus*, Drap., collected by him in Sutton Park, Sutton Coldfield.

The larger of the two specimens, although not quite full grown is undoubtedly referable to the variety *flagellus*, Cllge., described by me in 1893 (Ann. and Mag. N. H., 1893, s. 6. vol. xii, p. 252) as *Arion flagellus*.

The smaller specimen, when alive, exhibited two dark grey lateral bands, the portion beneath being white as well as the foot-fringe and foot sole. The whole of the dorsum was a light grey; the mantle similar to the type.

WALTER E. COLLINGE.

CURRENT LITERATURE.

Pilsbry, Henry A.—Manual of Conchology, ser. ii, vol. xvii (pt. 65), pp. 1—64, pls. 1—10. Philadelphia: Academy of Natural Sciences.

With the commencement of volume xvii the genus *Achatina*, Lamarck, is dealt with. After a few notes on the distribution, parasites and nomenclature, a key to the West African species is given, and the systematic review commenced.

The following new forms are described: *A. achatina*, L. var *monochromatica* from Angola, and *A. occidentalis*, from Corisco Island, West Africa. *A. panthera*, Fér. var. *fenestella*, Wasin Island, northern Zanzibar, var. *chrysoderma*, from Mauritius, and *A. fulica*, Fér. var *coloba*.

Jones, K. H. and Preston, H. B.—List of Mollusca collected during the commission of H.M.S. "Waterwitch" in the China Seas, 1900—1903, with descriptions of new species. Proc. Malac. Soc. Lond., 1904, vol. vi, pp. 138—151, 7 figs. in text.

One hundred and seventeen species are listed of which the following are new: *Eulota globosa*, *Limnaea mars*, *L. (Galnaria) wharioni*, *L. (G.) shantungensis*, *L. (G.) pettiti*, *Assiminea norburyi*, and *Pecten (Chlamys) farreri*.

Petch, T.—The Published Records of the Land and Fresh Water Mollusca of the East Riding [of Yorkshire], with Additions. Trans. Hull Sci. and Field Nat. Club, 1904, vol. iii, pp. 121—172, pls. xii, xiii.

Mr. Petch's paper forms an admirable resumé of the work done in this particular district on the Land and Freshwater Mollusca, but it is greatly to be regretted that, at a time when malacologists are prepared to sink all petty differences as to special views on nomenclature, in order to obtain uniformity, that the old nomenclature has here been adhered to; apart from this feature, the list is admirable and reflects great credit on its author.

Sykes, E. R.—On a new species of *Amastra* from the Hawaiian Islands. Ann. and Mag. N. H., 1904 (s. 7), vol. xiv, pp. 159, 160, 2 figs.

Amastra (Kauaia) rex, n. sp., somewhat recalls in form and appearance *Helicina agglutinans*. It belongs to the group of *A. alata*, Pfr., and *A. heliciformis*, Ancey.

Eliot, C. N. E.—On the *Doris planata* of Alder & Hancock. Proc. Malac. Soc. Lond., 1904, vol. vi, pp. 180, 181.

The author has examined specimens of *Platydoris planata* from Plymouth, and finds that they have all the essential characters of the genus *Geitodoris*. Whether or not the *G. complanata*, Bergh, is specifically distinct is doubtful, but if the same, the name *planata* (A. and H., 1855) has priority. Possibly the *Platydoris planata* examined by Garstang may be distinct from those now described.

Hedley, C.—Studies on Australian Mollusca. Pt. viii. Proc. Linn. Soc. N.S.W., 1904, pp. 182—211, pls. viii—x.

The author points out that the *Coxiella confusa*, Smith, is the same as *C. badgerensis* (Johnst.) which latter name has priority, and that the *Bythinia richmondiana*, Petterd, must yeild to the prior *Hydrobia petterdi*, Smith. To the same species is referred the *Tapa anodonta* of Musson and Hedley. Descriptions and figures of fourteen new species are given and one new genus *Stiva*, allied to *Rissoina* (type *S. ferruginea*, n. sp.), in addition to which many species are figured for the first time. *Lima sydneyensis* is a new name for *L. brunnea*, Hedley non Cooke.

Smith, Edgar A.—Note on *Terebra hedleyi*, Tate. Ibid., pp. 211, 212.

Mr. Smith points out that this is not a *Terebra*. The late Professor Tate stated that *Cingulina brazieri*, Angas, belonged to the genus *Terebra* and as the species-name was already in use in the latter genus, he changed it to *hedleyi*.

The author adds that he very much doubts whether this so-called species is anything more than a variety of *C. circinata*, A. Adams.

Roebuck, W. D.—Re-establishment of *Limax tenellus* as a British species. Journ. Conch., 1904, vol. ii, pp. 106—109.

All malacologists who take any interest in the Slug fauna of the British Isles will be pleased to learn that the author has satisfactorily established this slug as a member of our fauna. From the pine-woods of the Forest of Rothiemurchus, in the Vice-county of Easterness many examples have been received, also from Clackmannshire, about Inver, near Dunkeld, Perthshire, and Invercannie, near Banchory, Kincardineshire.

Hoyle, William E.—Report on the Cephalopoda. From Rpt. on Pearl Oyster Fisheries of the Gulf of Manaar. Roy. Soc. Lond., 1904.

The collection of Cephalopoda obtained by Prof. Herdman, though small, contains several novelties. The Octopods preponderate, and many are immature.

The new species are *Polypus herdmani* and *P. arborescens*. In this latter the surface presents a number of branched papillae; there are one or two over each eye, about a dozen on the back, a few on the ventral surface, and in most cases one or two on the outer aspect of each arm. The nature of these bodies is, as yet, very obscure. The possibility of their being either glandular or phosphorescent seems to be excluded by the fact that the fibrils come up to and give off a radiating tuft, whilst against a sensory function is urged the fact of the fusion of their lower portion with the surrounding tissues, and as yet no nerves have been traced to them. Possible, although it seems very doubtful, they may be parasitic.

Bartsch, Paul.—Notes on the genus *Sonorella*, with descriptions of new species. Smiths. Miscell. Coll., 1904, vol. 47, pp. 187—200, pls. xxviii—xxxiii.

The author finds that a careful examination of the nuclear whorls shows varations along several lines, and these may be utilised in grouping the species. Upon these varations he divides the genus up into four groups, viz., i. Group of *S. wolcottiana*, ii. Group of *S. hachitana*, iii. Group of *S. magdalensis*, and iv. Group of *S. fisheri*.

In the second group *S. ashmuni*, *S. nelsoni*, *S. goldmani*, *S. merrilli*, *S. dalli*, *S. mearnsi*, and *S. baileyi* are new species, with a new subspecies of the latter, *orcutti*. In the fourth group *S. fisheri* is also new.

All the species are well illustrated.

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EDITOR'S NOTES.

On completing another volume, the Editor tenders his grateful thanks to all who have in any way furthered the interests of the Journal during 1904.

It is with feelings of deep regret that we learn of the death of Professor E. von Martens.