

second and third small and equal in size, fourth to the tenth infusate and strongly serrate on the inner edge; the legs entirely pale.

*Hab.* Yuyama. Two male examples.

*Melanoxanthus pictipennis*, sp. n.

Niger, nitidus, fulvo-pubescent; thorace angulis flavis; elytris macula basali recta, posticis fasciis duabus luteis; antennis (basi excepta) infuscatis; pedibus flavis.

L. 5-6½ mill.

Elongate, somewhat parallel, with short tawny pubescence; the head black, convex, densely punctured; the thorax similarly punctured at the sides, more finely and much less thickly on the disk, anterior angles minutely and triangularly yellow, posterior angles more broadly yellow and somewhat acutely produced; the elytra black, with a longitudinal vitta at the base, occupying part of the third and fourth interstices and more shortly part of the fifth, before the middle of the dorsum a transverse fascia commences on the second interstice, widening out on the third, narrowing on the fifth and sixth, then again widening out to the margin, and extending along the epipleura almost to the humeral angle, midway between the middle and the apices of the elytra is another yellow band, nearly regular in width, and not touching the sutural interstice nor the outside edge of the wing-case, the striæ are rather fine and punctulate, the interstices flat and relatively wide, and somewhat rugosely punctulate; the legs are yellow; the antennæ yellow at the base, and from the fourth or fifth joint infusate.

A variety of the species has the anterior angles of the thorax black, and the median fascia interrupted on the fifth and sixth interstices.

*Hab.* Fukushima and Nataksugawa. Two examples only.

[To be continued.]

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IV.—*On the Land-Shells of the Sulu Archipelago.*

By EDGAR A. SMITH.

[Plate IV.]

OUR knowledge of the terrestrial Mollusca of the Sulu Archipelago is at present very limited, and the species about to be enumerated will form a considerable addition to the list of those already recorded from these islands.



The specimens just received by the British Museum were collected by Mr. A. Everett at the Tawi-Tawi group, on the islands of Sibutu, Bongao, Bilatan, and Tawi-Tawi itself, all of these being situated at the western part of the archipelago.

No land-shells have previously been recorded from any of these islands with the exception of Bongao. From this locality Dr. Möllendorff has given a list of twelve species.

The terrestrial mollusks from the remaining islands of the Sulu Archipelago are practically unknown, only two or three forms having been mentioned as occurring on Sulu itself\*.

The Rev. A. H. Cooke, in his instructive paper "On the Geographical Distribution of the Land-Mollusca of the Philippine Islands, and their Relations to the Mollusca of the neighbouring Groups" †, has arrived at certain conclusions, which, in light of the material now at hand, appear altogether untenable. Commenting upon Möllendorff's list of species, he observes:—"Six out of the eight known species are peculiar, while of the remaining two, one occurs in the Philippines and one in Borneo. As to genera, no exclusively Philippine genus occurs, while *Plectotropis*, *Macrochlamys*, *Trochonanina*, *Opisthoporus*, *Lagochilus*, and *Alycæus* are Indo-Malay. In spite, then, of the deep intervening channel, Bongao is distinctly Bornean, and, in spite of the chain of islands with shallow water between them, distinctly non-Philippine."

In the first place, I would observe that *Trochonanina conicoides* ‡ is not peculiar to Bongao, as he states, for it was described many years ago from Borneo, and has been recorded from that locality over and over again. Also it must not be supposed that the above genera quoted by Mr. Cooke as "Indo-Malay" have no representatives in the Philippines. Of *Macrochlamys* there are several species; *Trochonanina* is represented by one or two forms; of *Lagochilus* Mr. Cooke himself, in another part of his paper, enumerates nine; and of *Alycæus* two species are recorded from Luzon. One *Plectotropis* at least has been found in the Philippines; and *Opisthoporus* § occurs in Palawan, which is quite as much Philippine in its molluscan fauna as Bornean.

The following table (p. 51) shows at a glance the relative

\* *Trochomorpha Metcalfei*, *Corasia lais*, and *Cyclotus suluanus*.

† Proc. Zool. Soc. 1892, p. 461.

‡ The species here referred to is not the true *T. conicoides*, but a distinct species, viz. *T. bongaoensis*, mihi.

§ This genus is not known with certainty from Bongao, and the young shell doubtfully referred to it by Möllendorff and quoted by Cooke is, in all probability, the *Cyclotus variegatus* obtained there by Mr. Everett.



distribution of the Tawi-Tawi species. It will be noticed that the deep water (the Sibutu passage \*) which separates Sibutu from the rest of the Tawi-Tawi group does not appear to have been a bar in any way to, or to have influenced, the migration of forms to or from the Philippines or Bongao, Tawi-Tawi, and Bilatan.

Only one form occurring at Sibutu is met with exclusively in Borneo, whereas seven occur in the Philippines which are not known as Bornean.

There are only four species from Sibutu which have not as yet been found in any other island of the Tawi-Tawi group, whereas eleven occur in Sibutu which are also met with in one or other of these islands.

It is worthy of notice that of the four species peculiar to Sibutu two, namely *Helix marginata* and the *Corasia*, are most characteristic Philippine forms, and altogether unrepresented in Borneo; also that the remaining two, *Sitala orchis* and *Chloritis sibutuensis*, have respective Philippine representatives.

Of the nineteen species found in the islands of the Tawi-Tawi group east of Sibutu, no less than eleven or twelve occur also in the Philippines, whereas only three are common to Borneo, and these are also met with in the Philippines.

From these facts it is therefore quite evident that the land-shells of the Tawi-Tawi Islands are distinctly Philippine rather than Bornean, and my colleague Dr. R. B. Sharpe informs me that the same is observable with regard to the avifauna.

If we proceed beyond this fact we merely enter the region of theorizing and speculation. It is natural to suppose that the species common to Tawi-Tawi and the Philippines originated in the latter locality, and that in the course of ages (how remote we know not) they have become dispersed or migrated westward.

On the other hand, we may conjecture that certain species, starting originally from Borneo, have extended to Tawi-Tawi, and so on to the Philippines.

With regard to the origin of the various genera it is hopeless to speculate. How, when, and where, for instance, did *Cochlostyla* originate? We may theorize upon such questions as these, but I am afraid our conclusions will be very far from convincing.

\* The depth of this passage is marked on the Admiralty charts 500 fathoms; but Mr. Everett informs me that it has been lately sounded by Capt. Field, of H.M.S. 'Egeria,' and that the extreme depth did not exceed 267 fathoms.



## The Distribution of Tawi-Tawi Land-Shells.

Names of the Species.	Borneo.	Sibutu.	Bongao, Tawi-Tawi, or Bilatan.	Philippines.	Other localities.
<i>Macrochlamys angulata</i> .....	..	*	*		
<i>Lamprocystis myops</i> .....	..	*	*	*	Balabac.
<i>Sitala orchis</i> .....	*	*			
<i>Trochonanina bongaoensis</i> .....	..	..	*		
<i>Trochomorpha Metcalfei</i> .....	*	*	*	*	Palawan.
<i>Helix</i> ( <i>Plectotropis</i> ) <i>squamulifera</i> .....	..	*	*		
— ( <i>Chloritis</i> ) <i>sibutuensis</i> ..	..	*			
— <i>marginata</i> .....	..	*	..	*	
<i>Cochlostyla</i> ( <i>Corasia</i> ) <i>ægrola</i> ..	..	*	..	*	
— ( <i>Hypselostyla</i> ) <i>boholensis</i> ..	..	..	*	*	
<i>Amphidromus maculiferus</i> .....	..	..	*	*	
<i>Cyclotus variegatus</i> .....	..	..	*	*	Sulu.
— <i>bongaoensis</i> .....	..	..	*		
<i>Cyclophorus philippinarum</i> .....	..	*	*	*	
<i>Alycæus excisus</i> .....	..	..	*		
<i>Leptopoma atricapillum</i> .....	..	*	*	*	
— <i>vitreum</i> .....	*	*	*	*	{ Palawan, Balabac.
<i>Lagochilus quinqueliratus</i> .....	..	*	*		
<i>Pupina ottonis</i> .....	..	..	*	*	
<i>Diplommatina Roebeleni</i> .....	..	..	*		
<i>Helicina Martensi</i> .....	*	*	*	*	
— <i>lazarus</i> .....	..	*	*	*	
— <i>contermina</i> .....	..	*	*	*	

1. *Macrochlamys angulata*, Möllendorff.  
(Pl. IV. fig. 1.)

*Macrochlamys angulata*, Möllendorff, Jahrbuch. deutsch. mal. Gesell.  
1887, p. 289.

*Hab.* Bongao, Tawi-Tawi, Sibutu.

2. *Lamprocystis myops*, Dohrn & Semper.

*Nanina myops*, D. & S. Mal. Blätt. 1862, p. 206; Pfeiffer, Novit.  
Conch. vol. ii. p. 221, pl. lviii. figs. 5-8.

*Hab.* Bilatan and Sibutu; also Mindanao (*D. & S.*),  
Balabac (*Hidalgo*).



The specimens from Bilatan and Sibutu agree in every detail with examples from Mindanao.

### 3. *Lamprocystis*, sp.

*Hab.* Bongao.

Only two specimens of this species were collected by Mr. Everett. They are more depressed in form than *L. myops*, and the microscopic concentric striæ on the base are more apparent. It is likely that these differences will be found persistent, but I deem it advisable at present to await further material before separating this form as a distinct species.

### 4. *Sitala orchis*, G.-A.

*Sitala* (?) *orchis*, Godwin-Austen, Proc. Zool. Soc. 1891, p. 40, pl. v. fig. 3.

*Hab.* Sibutu.

There appears to be no difference between the specimens from the above locality and those found at Labuan and Barit Mountain, North Borneo, by Mr. Everett.

### 5. *Trochonanina bongaoensis*. (Pl. IV. figs. 2-2 b.)

Testa depressa, orbicularis, acute carinata, imperforata, fusca; spira breviter conica, vix convexiuscula; anfractus 7, planiusculi, supra suturam anguste impressè marginati, lente accrescentes, supremi 2-3 lævigati, cæteri striis incrementi obliquis aliisque spiralibus tenuibus sculpti, ultimus acute et subcomprime carinatus, inferne haud spiraliter striatus; apertura obliqua, utrinque acuta; peristoma roseo-albidum, margine basali peculiariter tortuoso et incrassato.

Diam. maj.  $13\frac{1}{2}$  millim., min.  $12\frac{1}{2}$ , alt. 7.

*Hab.* Bongao and Sibutu.

This species appears to be the same as that identified by Möllendorff as a variety of *T. conicoides* (Metcalf), to which he gave the name var. *crenulata*. It is, however, very distinct from that Bornean species in size and form. It more nearly approaches *T. paraguensis*, Smith, from Palawan, but is easily separable by comparison. It is smaller, darker in colour, the whorls are less convex, the suture less obvious, and the spire more convex. The aperture also is of a somewhat different form, and the basal margin of the peristome is rather more tortuous but similarly thickened. I have not adopted the varietal name *crenulata* for this species in case it may be different from that described by Möllendorff, and, moreover, it does not seem particularly applicable, the crenulation at the keel being so very feeble.



6. *Trochomorpha Metcalfei*, Pfeiffer.

*Helix Metcalfei*, Pfr. Conch.-Cab. ed. 2, p. 175, pl. xcvii. figs. 10-12, var. figs. 13, 14; Deshayes, Hist. Nat. Moll. vol. i. p. 367, pl. ci. figs. 10-12.

*Helix solarioides*, Reeve, Conch. Icon. pl. xxx. figs. 127 a-c.

*Helix boholensis*, Semper, Hidalgo, Journ. de Conch. 1887, pl. iv. figs. 1-1 a.

*Hab.* Tawi-Tawi, Bongao, Bilatan, Sibutu.

Two forms of this species occur at the above islands. One resembles that represented by Pfeiffer's figures 10-12 and Reeve's figures 127 b, c. The specimens, however, are smaller, and the brown zones above and below the periphery are narrower and less pronounced. The diameter of average specimens is 15 millim. This variety occurs at all four of the above islands. The other form, which occurs at Bilatan, Bongao, and Sibutu, is similar to that figured by Pfeiffer (*l. c.* figs. 13, 14) and by Reeve (fig. 127 a). The specimens are a little smaller than those just referred to, of a pale greenish-yellow tint, and the keel is of a very deep brown-black colour, like the narrow zones above and below, which, together with the carina, form one dark peripheral zone. In the Philippine examples figured by Pfeiffer the keel is whitish (= *boholensis*, Semper). Möllendorff is of opinion that there is sufficient difference between *Metcalfei* and *boholensis* to distinguish them, but with this opinion I cannot concur.

7. *Helix (Plectotropis) squamulifera*, Möllendorff.  
(Pl. IV. figs. 3, 3 a.)

*Helix (Plectotropis) squamulifera*, Möllendorff, Jahrbuch. deutsch. mal. Gesell. 1887, p. 290.

*Hab.* Bongao (*Mölldf. & Everett*); Sibutu (*Everett*).

The specimens described by Möllendorff were immature, and consequently he could not complete the description of the peristome. It is pinkish white, scarcely thickened at all, slightly expanded above and somewhat reflexed below. The largest example is 15 millim. in diameter, but an average specimen is only about 13.

8. *Helix (Chloritis) sibutuensis*.  
(Pl. IV. figs. 4, 4 a.)

Testa depresso globosa, anguste umbilicata, subsolida, rufo-fusca, linea saturatiore ad peripheriam cineta; anfractus 5, leviter convexi, apicales concinne punctati, cæteri lineis incrementi tenuibus striati, indistincte punctati, ultimus antice vix descendens; aper-



tura lunata, obliqua, intus lilacea; peristoma albidum, incrassatum, breviter expansum et reflexum, marginibus callo tenuissimo junctis, columellari supra umbilicum leviter reflexo.

Alt. 14 millim., diam. maj.  $19\frac{1}{2}$ , min.  $16\frac{1}{2}$ ; apertura cum perist. 10 longa, 12 lata.

*Hab.* Sibutu.

This species bears some resemblance to the Bornean *C. tomentosa*, but it is, however, rather more globular, has a peripheral reddish line, a thicker lip, and the aperture is of a different shape.

### 9. *Helix marginata*, Müller.

*Helix marginata*, Reeve, Conch. Icon. figs. 129 a, b; Pfeiffer, Conch.-Cab. ed. 2, pl. lxxviii. figs. 7-9.

*Hab.* Sibutu.

The specimens from this locality are rather small, the largest having a diameter of 21 millim. only. They are ornamented with a single narrow deep brown line revolving up the centre of the whorls, and two others of a much paler tint and not so well defined, one above the keel and the other a little below the suture. The central basal zone is also narrower than that depicted by Pfeiffer (fig. 9) or by Reeve (fig. 129 b).

### 10. *Cochlostyla* (*Corasia*) *ægrola*, Reeve. (Pl. IV. fig. 5.)

*Helix ægrola*, Reeve, Conch. Icon. fig. 95.

Testa imperforata, depresso globosa, tenuis, subpellucido-alba, nitens; anfractus  $3\frac{1}{2}$ , celeriter crescentes, convexiusculi, lineis incrementi obliquis tenuibus sculpti, ultimus ad peripheriam primo obtuse angulatus, sed versus aperturam magis rotundatus, haud descendens; apertura magna, alta; sutura linearis, lacteo anguste marginata; spira parum elata vel subdepressa, ad apicem obtusissima; columella paulo obliqua, tenuis, superne anguste dilatata; peristoma tenue, vix expansum, albidum.

Var. *zonata*. Testa circa medium anfr. ultimi et ad suturam zona angusta ornata.

Diam. maj. 28 millim., min. 22, alt. 19; apertura 15 alta et lata.

*Hab.* Sibutu.

Of thirty-four specimens collected by Mr. Everett only five belong to the banded variety. Besides the lines of growth, in some examples some very faint spiral striæ are more or less discernible under a lens, especially upon the base of the last whorl towards the umbilical region. *C. magtanensis*,



Semper \*, is considerably like this species in form and colour, but is less glossy, and the columella is more oblique, so that it passes more gradually into the curve of the peristome. In *C. ægrota*, being more upright, it forms a distinct but rounded angle at the base. In the latter species also it is a trifle less widely expanded above, and has perhaps a straighter and more even edge than that of *C. magtanensis*. The surface of that species is dull above and only glossy upon the central portion of the base. *C. Broderipii*, Pfr.†, is also an allied form. The latter appears quite distinct from the *C. Broderipii* as figured by Reeve (Conch. Icon. fig. 88), which can scarcely be the *H. dealbata* of Broderip, as he supposed.

The description given above is taken from the Sibutu specimens, which are all smaller than the type from Mindoro figured by Reeve. The Mindoro shell is rather more solid and consequently less pellucid and not so glossy as those from Sibutu, the latter feature being maintained in the other Philippine examples examined.

### 11. *Cochlostyla (Hypselostyla) boholensis*, Broderip.

*Bulimus boholensis*, Reeve, Conch. Icon. pl. viii. figs. 37 *a*, *b*.

*Hab.* Bilatan.

About two dozen specimens of this species from Bilatan do not appear separable from this Philippine (Bohol) species. Some of them are almost entirely without the undulating markings, but others have more or less of this ornamentation. *C. camelopardalis*, Brod., appears to be a form of this species.

### 12. *Amphidromus maculiferus*, var. (Pl. IV. figs. 9, 9 *a*.)

*Bulimus maculiferus*, Sowerby, Reeve, Conch. Icon. figs. 26 *a*, *b*;  
Pfeiffer, Conch.-Cab. ed. 2, pl. xxxvi. figs. 1, 2, pl. xl. fig. 9, var.;  
Hidalgo, Journ. de Conch. 1888, p. 31, pl. vi. fig. 1.

*Hab.* Bilatan Island.

The specimens from Bilatan present but the faintest trace of oblique strigation, like some of the Philippine examples. They more resemble the variety figured by Hidalgo, being either pale lemon-yellow or pinkish white. They are rather smaller than normal specimens, having an average length of about 50 to 55 millim. All as yet examined are sinistral.

\* 'Reisen im Arch. Philippinen,' Land-Moll. p. 170, pl. x. figs. 11 *a*, *b*.

† The dimensions given by Pfeiffer of this species do not accord with his figure.



13. *Cyclotus suluanus*. (Pl. IV. fig. 7.)*Cyclotus suluanus*, Möllendorff, MSS.

Testa globosa, anguste umbilicata, pallida, rufo-fusco copiose maculata et fulgurata, apicem versus nigrescens, infra peripheriam albidam zona colorata distincta ornata, inferne circa umbilicum pallida, haud maculata; anfractus 5, perconvexi, lineis incrementi obliquis tenuibus aliisque spiralibus subobsoletis striati, ultimus antice levissime descendens; apertura circularis, longit. totius  $\frac{1}{2}$  paulo superans; peristoma leviter incrassatum, vix expansum; operculum utrinque leviter concavum, anfractibus circiter 7 ad suturam carinatis, transversim oblique striatis.

Diam. maj. 21 millim., min. 17, alt. 18; apertura 10 longa et lata.

*Hab.* Sulu (*Dr. Hungerford's collection*).

Two specimens of this species in the British Museum originally formed part of Dr. Hungerford's collection, and they are referred to by the Rev. A. H. Cooke (P. Z. S. 1892, p. 461) under the above name. The label accompanying them, in Dr. Möllendorff's handwriting, gives the locality "Sulu," so that I think we may safely conclude that the specimens are from that island.

The species is remarkable for its globose form and its cyclophoroid appearance, considerably recalling the aspect of *C. exaltatus*, Pfr., from Hong Kong. The operculum fits within the extreme margin of the aperture, so that its outer surface is almost flush with the peristome.

14. *Cyclotus variegatus*, Swainson, var.

*Cyclotus variegatus*, Sw., Reeve, Conch. Icon. figs. 29 *a, b*; Kobelt, in Semper's Reisen im Arch. Philippinen, Landdeckelschnecken, p. 5, pl. i. fig. 5.

*Hab.* Sulu (*Hungerford collection in Brit. Mus.*); Bongao (*Everett*).

A fine single example of this species was obtained from Dr. Hungerford's collection with a label in Dr. O. F. v. Möllendorff's handwriting as follows:—" *Cyclotus variegatus*, Swains., var. *grandis*, Mlldff. Sulu. (Running into *batchianensis*, perhaps new!)"

I certainly agree with Dr. Möllendorff in his determination, and the example obtained by Mr. Everett at Bongao, although somewhat smaller than the shell in question, evidently belongs to the same species. *C. Boxalli* of Godwin-Austen and *C. euzonus*, Dohrn, are extremely close allies, the latter, however, being distinguishable by its distinctive coloration.



15. *Cyclotus bongaoensis*. (Pl. IV. figs. 8, 8 a.)

Testa minima, late umbilicata, suborbicularis, sordide albida, ad apicem purpureo-rubra, epidermide luteo-olivacea induta, plerumque limo tunicata; anfractus  $3\frac{1}{2}$ , perconvexi, sutura profunda sejuncti, celeriter crescentes, liris tenuissimis spiralibus ornati, lineisque incrementi tenuibus sculpti, ultimus antice paulo descendens et solutus; apertura circularis, parva; peristoma simplex; operculum album, nucleo nigrescente, leviter concavum, anfractibus angustis circiter 8 oblique striatis.

Diam. maj. 5 millim., min. 4, alt.  $3\frac{3}{4}$ ; apertura 2 lata.

*Hab.* Bongao.

In form this species resembles *C. pusillus*, Sowerby, a Philippine form, and *C. linitus*, Godwin-Austen, from Borneo. It also agrees with the latter in the habit of coating its surface with earth. It is, however, a smaller species than either, and differs from them in having spiral sculpture not only upon the apical whorls but also upon the rest. The mud- or earth-coating is produced into two keels, one around the upper part of the body-whorl and the other below the middle, giving it a quadrate appearance.

16. *Cyclophorus philippinarum*, Sowerby, var.

*Cyclophorus philippinarum*, Sow. Thesaurus, vol. i. p. 125, pl. xxix. figs. 205-207; Reeve, Conch. Icon. figs. 64 a, b; Kobelt, Semper's Reisen im Arch. Philippinen, Landdeckelschnecken, pl. iv. figs. 24, 25.

*Hab.* Bongao and Sibutu.

The shells from the above localities belong to that form which has been named *C. Sowerbyi* by Hidalgo (Journ. de Conch. 1888, p. 80). They include two varieties; the pale form accords with Hidalgo's var.  $\gamma$ , and the dark examples correspond closely with his typical form.

17. *Alycæus excisus*, Möllendorff.

*Alycæus excisus*, Möllendorff, Jahrbuch deutsch. mal. Gesell. 1887, p. 287.

*Hab.* Bongao (Möllendorff).

This species was not obtained by Mr. Everett.

18. *Leptopoma atricapillum*, Sowerby.

*Cyclostoma atricapillum*, Sow. Thes. Conch. vol. i. p. 137, pl. xxx. figs. 230, 231.

*Leptopoma atricapillum*, Reeve, Conch. Icon. figs. 6 a, b; Kobelt in Semper's Reisen im Arch. Philippinen, pl. vii. figs. 6, 7.

*Hab.* Bilatan, Bongao, and Sibutu.



There are three varieties from these islands, but they all occur on Bilatan:—

1. Of a pale horn-colour, variegated with light brown wavy markings; peripheral keel pale.
2. Coloured like no. 1, but marked with a distinct infra-peripheral brown zone.
3. Of a uniform dark chestnut-colour, excepting the central keel and the peristome, which are white.

The two latter varieties were only obtained at Bilatan by Mr. Everett, and variety 1, met with at Bongao and Sibutu, was also found at Bilatan.

### 19. *Leptopoma vitreum*, Lesson.

*Leptopoma vitreum*, Hidalgo, Journ. de Conch. 1888, p. 91.

*Hab.* Sibutu, Bongao, and Bilatan.

The examples from these islands are rather small in comparison with specimens from the Philippines and other localities, and they are separable into five colour-varieties. The uncoloured form was not met with.

### 20. *Lagochilus quinqueliratus*, Möllendorff. (Pl. IV. figs. 10, 10 a.)

*Lagochilus quinqueliratus*, Möllendorff, Jahrb. deutsch. mal. Gesell. 1887, p. 286.

*Hab.* Tawi-Tawi, Bongao, Sibutu (*Everett*); Bongao (*Möllendorff*).

### 21. *Pupina ottonis*, Dohrn.

*Pupina ottonis*, Dohrn, Sowerby's Thesaurus, Pupinidæ, pl. iii. fig. 25; Reeve's Conch. Icon. vol. xx. pl. iii. fig. 25; Kobelt in Semper's Reisen im Arch. Philippinen, pl. vii. fig. 19.

*Hab.* Bongao and Tawi-Tawi.

Some examples are entirely devoid of colour, being quite pellucid, but others are of the normal bronzy-brown tint.

### 22. *Diplommatina Roebeleni*, Möllendorff. (Pl. IV. figs. 11, 11 a.)

*Diplommatina Roebeleni*, Möllendorff, Jahrbuch deutsch. mal. Gesell. 1887, p. 287.

*Hab.* Bongao (*Everett and Möllendorff*).



23. *Helicina Martensi*, Issel.

*Helicina Martensi*, Issel, Ann. Mus. storia nat. Genova, 1874, vol. vi. p. 444, pl. vi. figs. 23-25; Möllendorff, Jahrb. deutsch. mal. Gesell. 1887, p. 289.

*Hab.* Tawi-Tawi, Bongao, and Sibutu (*Everett*); Bongao (*Möllendorff*); Labuan (*Issel*); Barit Mountain, N. Borneo (*Everett*).

I am inclined to think that this so-called species is merely a dwarfed form of the Philippine *H. polita*, Sowerby. The specimens from the Tawi-Tawi group are small, like Bornean examples, and all of them, with one exception which is uniformly yellow, have a white band beneath the suture. A similar style of coloration occurs in some of the Zebu specimens of *polita*. The opercula of both forms are similar in colour and sculpture.

24. *Helicina lazarus*, Sowerby.

*Helicina lazarus*, Sow. Thes. Conch. i. p. 11, pl. ii. fig. 91, vol. iii. p. 295, pl. cclxxviii. figs. 444, 445; Conch. Icon. figs. 208 *a, b*; Pfeiffer, Conch.-Cab. p. 58, pl. vii. figs. 18, 19.

*Hab.* Bongao and Sibutu.

All the examples from the above localities are coated with earth, which at the periphery forms an acute jagged keel. No mention is made by Sowerby or Pfeiffer of this characteristic; but in the type specimens from Luzon, which have been cleaned, traces of earth are visible. *H. cyrtopoma* of Möllendorff and a few other species have a similar habit of agglutinating earth to the surface of their shells.

25. *Helicina contermina* (Semper), Kobelt.

(Pl. IV. figs. 6, 6 *a*.)

*Helicina contermina*, Kobelt, Semper's Reisen im Arch. Philippinen, Landdeckelschnecken, p. 76, pl. vii. fig. 32.

*Hab.* Sibutu and Bilatan.

The majority of the specimens collected by Mr. Everett were obtained at Sibutu, only six examples coming from Bilatan. The colour of this species is variable. It may be uniformly lemon-yellow or pinkish red, with the exception of the keel which is whitish, and a narrow reddish or brown zone beneath the carina occurs in many specimens.



## EXPLANATION OF PLATE IV.

- Fig. 1. *Macrochlamys angulata*.  
 Figs. 2-2b. *Trochonanina bongaoensis*.  
 Figs. 3, 3a. *Helix (Plectotropis) squamulifera*.  
 Figs. 4, 4a. — (*Chloritis*) *sibutuensis*.  
 Fig. 5. *Cochlostyla (Corasia) ægrota*, var.  
 Figs. 6, 6a. *Helicina contermina*.  
 Fig. 7. *Cyclotus suluanus*.  
 Figs. 8, 8a. — *bongaoensis*.  
 Figs. 9, 9a. *Amphidromus maculiferus*.  
 Figs. 10, 10a. *Lagochilus quinqueliratus*.  
 Figs. 11, 11a. *Diplommatina Roebeleni*.

V.—On the Dentition of Pella Burnupi, Melvill and Ponsonby. By HENRY SUTER, Christchurch, New Zealand.

[Plate V. B.]

SOME time ago Mr. J. H. Ponsonby kindly sent me a number of Helicidæ from South Africa, and, on carefully examining them, I was astonished how some of them showed distinct relations to forms from New Zealand. Fortunately there was one specimen of *Pella Burnupi*, M. & P., in which the dried-up animal was left, and, after proper treatment, I succeeded in getting it out of the shell, leaving the tail well preserved. In preparing jaw and radula great care was used, as those parts of the mouth are often exceedingly fragile when the animal has been dry for a long time. The mounting of the radula was successful, but the jaw broke in several pieces, without, however, impeding the study of its detail structure.

*Jaw* (Pl. V. B. fig. 1) arcuate, folded in about twenty vertical plaits, which are about five times longer than broad, and strongly transversely striated. Between the plaits a small transparent interstice is left. Cutting-margin broadly indented.

*Radula* (fig. 2) tongue-shaped, consisting of numerous transverse straight rows of teeth, 20—1—20, of which five or six may be taken as laterals.

Central tooth quadrangular, slightly longer than broad, rounded in front; reflexion tricuspid, the median cusp reaching almost to the posterior end of the base; the side cusps short, sinuated at the outer sides; median cutting-point well developed, extending a little over the next row of teeth; the side cutting-points minute.

Laterals very much like the rhachidian, the median and





Smith, E. A. 1894. "IV.—On the land-shells of the Sulu Archipelago." *The Annals and magazine of natural history; zoology, botany, and geology* 13, 48–60.

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