

evidently with a net; the state of their sexual organs shows that the spawning commences at that time of the year. It must be very difficult to catch the fishes after the middle of November, partly because they retire into the deeper parts of the lake, and partly because the attempts to set nets are frustrated by the stormy weather of the season. Repeated endeavours to obtain more specimens, made by the Earl of Enniskillen, proved to be unsuccessful. In a letter from Mr. J. Walker, this gentleman mentions that he saw one taken with a fly in the month of August.

The Earl of Enniskillen mentions, in a letter directed to Mr. Thompson, that the "Freshwater Herring" is plentiful in the middle of November. "The people are now taking them in cartloads. The flesh of such as I send is white and soft, and different from what that of Charr is in any other lough." Mr. Thompson* saw the female; and, according to him, it is externally not different from the male. The ovaria contained 959 ova in a specimen 11 inches in length, each being two lines in diameter.

Number of vertebræ sixty, as ascertained by Thompson in a male and female fish, and by myself in two males.

7. REVIEW OF THE VERMETIDÆ. BY OTTO A. L. MÖRCH (OF COPENHAGEN). (Part III.)

[Concluded from Proc. Zool. Soc. 1861, p. 365.]

BIVONIA, Gray, 1850.

The *Bivinæ*, Gray, Cat. Brit. Mus. 1842, p. 62.

Bivonia, Gray, *ibid.* p. 90; Gray, 1850, in Mrs. Gray's Fig. iv. p. 82. no. 3; Adams, Genera, i. p. 358.

T. affixa, plerumque spiralis, apertura contracta circulari, sæpe liris spiralibus interrupto-nodulosis et lira mediana elevata; columella lævissima, nitida.

Animal tentaculis cylindricis, filamentis pedalibus subulatis vel setaceis. Operculum parvum, rudimentare (Phil.).

Dr. Gray gives (in the Brit. Mus. Cat. 1842, p. 62) the following character:—"The *Bivinæ* have an orbicular spiral operculum, with an oblong lateral scar like the *Trochi*." I suppose this description was made from a broken specimen, giving the muscular impression the appearance of being lateral. In the Brit. Mus. Cat. for 1840, quoted in Proc. Zool. Soc. no. 258, by Dr. Gray, I cannot find anything about this genus. The edition 1844, quoted in the same place, is, according to the indication of the pages 62 & 90, no doubt a typographical error. In the Systematic Index of Mrs. Gray's Fig. of Mollusca, p. 82, the diagnosis is altered thus:—"Operculum rudimentary, small (spiral?)," which is evidently taken from Philippi's description of *Vermetus triqueter*, Biv.,—"Operculum parvum, rudimentare," which must thus be regarded as the type. Of the other

* Ann. and Mag. Nat. Hist. 1841, vi. p. 443.

species referred to this genus, *V. glomeratus*, Biv., having a large convex operculum, is a *Spiroglyphus*; and *V. subcancellatus*, Biv., is a true *Vermetus*. The *V. semisurrectus*, Biv., with an "operculum fere completum," seems not, according to the figure of Philippi, to differ in the size of the operculum from the typical species.

1. BIVONIA TRIQUETRA, Bivona, 1832.

T. solitaria aut gregaria, extus apicem versus saltem triquetra et depressiuscula, orbiculatim vel turbinatim contorta, rugis transversim flexuosis; antice sæpe elongata, cylindrica.

T. ejusdem structuræ atque V. gigantis, sed multo minor; diameter tubi enim nunquam $2\frac{1}{2}$ mill. excedit. Apex et interdum tota testa, si solitaria, exquisite triquetra, basi adnata depressa; pars testæ libera autem semper cylindricam formam induit. Rarius præter carinam dorsalem, costæ 2-3 adsunt; plicæ transversæ validæ, rugosæ, irregulares, in parte cylindrica multo minus conspicuæ. Color albidus aut fuscescens.

Animal operculo parvo, rudimentari, tentaculis superioribus cylindricis, paululum retractilibus, inferioribus setaceis longissimis; nigrum, pallio flavescente; aut albidum, luteo, violaceo vel badio maculatum (Phil.).

Massa quædam formata ab aliis tubulis, &c., Bonanni, ii. 20 E.

Vermetus triqueter, Bivona, Nuov. Gen. 1832, p. 11 (Phil.); Philippi, Enum. i. p. 170. t. ix. f. 21, ii. p. 143; Siebold, Wirbellose Thiere, p. 344. 2.

Bivonia triquetra, Gray, Fig. iv. p. 82, t. 58. f. 4.

Vermetus (Aletes?) triqueter, Mörch, Journ. Conch. viii. 36.

Var. α. PINNICOLA (Mus. reg.).

T. irregulariter spiralis, lineis tribus longitudinalibus crenulatis (Gravenhorst).

Vermicularia granulata, Gravenh. Tergestina, 1831, p. 65. no. 5 (non Fabr.).

On the large *Pinna*, Seba, Thes. iii. tab. 91. no. 1.

Vermetus granulatus, Forbes, Ægæan Report, p. 138, verisim.

? *Serpula rupestris*, Risso, Eur. Mær. p. 204. no. 25?

Var. β. SPIORBIS.

T. solitaria, alba, cretacea, spirorbiformis, apertura soluta; carina dorsali crenulata, varicibus arcuatis 1 vel 2 in anfr. penultimo; latere externo subperpendiculari, liris confertis obsoletissimis; striæ incrementi irregulares, sigmoideæ, sæpe membranaceæ, peripheriam versus incrassatæ, in locis occultis pulcherrime undulato-squamulosæ; anfr. primi carnei.

Diam. testæ 19 m.; diam. aperturæ $3\frac{3}{4}$ m.

Hab. In littore Dalmatiæ (coll. Dunkeri in lapide).

Var. γ. ALETES.

T. lateraliter affixa, anfr. obliquis decumbentibus planis; carina dorsalis compressa, crenulata, umbilicum approximans; striæ in-

crementi membranaceæ, obsolete undulatæ in regione umbilicali (Philippi, t. 9. f. 21).

Hab. In littore Dalmatiæ cum præcedente (*coll. Dunkeri*).

T. juvenilis læviuscula, fusco-rosea vel carnea, spirorbiformis, leviter corrodens.

Diam. testæ $2\frac{1}{2}$ m. ; diam. aperturæ $\frac{3}{4}$ m.

On the old specimens in the group belonging to Prof. Dunker.

Var. δ . SERPULINA.

T. glomerata, lira dorsali funiculari prominula ; liræ longitudinales remotæ, interruptæ ; rugæ incrementi confertæ, sæpe submembranaceæ, undulatæ ; varice erecto juxta aperturam ; anfr. primi planorbiformes ; testa infantilis bullata, nitidula, castanea.

A detached crust in the coll. of Prof. Dunker.

Var. ϵ . EXPANSA.

T. solitaria, corrodens, spirorbiformis ; anfr. ultimus carina dorsali compressa, punctis ferrugineis remotis ; latere externo basi dilatato crenulato ; liris longitudinalibus obsoletissimis ; rugæ et striæ incrementi leviter sigmoideæ ; apertura circularis, soluta, contracta.

Diam. aperturæ 4 m. ; diam. anfr. ult. 6 m. ; diam. testæ circ. 22 m.

Hab. Ad ins. Madeira (*Mus. Cuming*). On *Patella longula*, Meusch., whereon it has formed a bed nearly going through the shell.

Var. ζ . AMPLIATA.

T. repens, spiraliter torta ; anfr. primi obliqui, decumbentes ; varice dorsali juxta aperturam ampliata subquadrangularem.

Diam. aperturæ fere 7 m.

Hab. In mare Mediterraneo (*Mus. Cuming*). A few specimens of this variety are to be seen on the under edge of the large crust of *Spirogyphus glomeratus*, described above.

Var. η . FASCICULARIS.

Testis aggregatis, basi spiratis, antice porrectis, teretibus, subfastigiatis (Phil.).

Vermetus triqueter, var., Biv. Nuov. Gen. t. 2. f. 4 (Phil.).

Vermetus triqueter, var. β , Phil. Enum. i. p. 170, t. 11. f. 22.

Bivonia triquetra, Gray, Figs. i. pl. 58. f. 4 (copy).

Hab. In Sicilia, frequens (Phil.).

"Var. β , quam libenter speciem peculiarem esse crederes, ad instar *Madreporarum* cespitosa rupes vestit, et ipsa massas non spernendæ molis constituit ; partem tantummodo attuli ultra 1' longam, 6-7''' latam."—Philippi.

Philippi never observed varices in this species. The specimens I have compared showed generally one or two varices in the last and penultimate whorls. The variety η is a good transition to the following species, from which perhaps it does not differ.

2. BIVONIA SEMISURRECTA, Bivona, 1832.

T. solitaria, cylindrica, apice contorto, rugosa, adnata, antice longe porrecta, varicosa, sæpe striis longitudinalibus subgranosis asperula.

T. minus vitrea, tenuior, facilius quam reliquæ cum Serpulæ testa confundi potest, præsertim cum sculptura plerumque obsoleta, aut propter crustam calcaream non conspicua sit.

Diam. tubi variata 2-4".

Plerumque apex tantum adnatus; et pars antica, sæpe usque ad 4" longa, libera est, sæpe lævissima. Varices manicæformes hæc species frequentius ostendit quam reliquæ; colorem semper album vidi (Phil.).

Animal operculo fere completo, tentaculis omnibus retractilibus, superioribus cylindricis, inferioribus longioribus subulatis; caput et pedem fulva punctis cæruleo-fuscis marmorata, collare fulvum cæruleo-fusco articulatam ostendit, semel ego anteriorem animalis partem pulchre cinnabarinam punctis albis adpersam, et punctis nigris circa operculum ornatam, collare autem cinnabarinum nigro articulatam vidi. Tentacula inferiora subverrucosa, intus longitudinaliter subsulcata (Philippi).

Vermetus semisurrectus, Bivona, Nuov. Gen. p. 10, t. 2. f. 3; Philippi, Enum. p. 171, t. 9. f. 1911, p. 144; vix Lacaze Duth.

Bivonia semisurrecta, Gray, Figs. p. 28, t. 58. f. 1; Adams, Genera, p. 358.

Vermetus (Aletes?) semisurrectus, Mörch, Journ. Conch. viii. p. 39.

Hab. In mari Mediterraneo (Sicilia) frequens plerumque testaceis, rarius scopulis adnata (Philippi).

Dr. Hornbeck has received a specimen of this species attached to *Murex branderis*, L., from M. Bivona, jun., which agrees perfectly with the above description; but the median lira on the penultimate whorl is a little more prominent than in the others. In the Museum of Breslau is a specimen of nearly twice the diameter of Philippi's, represented pl. 9. f. 19, and which yet appears to be the same species. I believe this species is only the adult state of the preceding. The chief differences are afforded by the animal; in the present species all the tentacula are stated to be retractile, whilst in the preceding species only the superior are a little retractile; but these observations are probably not founded on very exact investigations. The brim of the mantle is simple, not reflected as in *B. triquetra*; but this character is very likely only momentary. The colours are very different, but seem not to be constant, and are subject to great variations. In the first volume of 'Enumeratio,' Philippi describes the lid thus—"Operculum fere completum;" but in the second volume—"Operculum completum, tenue, planum." Philippi's representations of the two species seem to me to show the opercula of the same size in proportion to the lumen of the tubes. The animal represented by Lacaze Duthiers as *V. semisurrectus* seems not to have any lid; I suppose, therefore, it is *V. gigas*, Biv.

3. BIVONIA SUBTRIQUETRA, Mörch.

T. valida, lateraliter affixa, irregulariter torta; anfr. primi lituiformes vel planorbiformes; carina mediana elevata, compressiuscula; latere externo planiusculo, subperpendiculari, basi expanso, liris plerumque destituto; latere interno convexiusculo (in junioribus plano), liris 10–12 æquidistantibus; striæ incrementi leviter sigmoideæ; dissepimenta interna tenuia, convexa. Diam. aperturæ circ. 12 m.

Var. α. SQUAMIFERA.

T. carina dorsali parum prominente, squamis paucis remotis compressis acutis; latere interno liris 4–5 validis angustis subsquamosis, interstitiis lirulis 1–2 inæqualibus; latere externo superne lirulis 2–3.

Diam. aperturæ circ. 7 m.

? Favanne, La Conchyl. pl. 66. f. B 2, fem. juvenile?

Fossilis in form. tertiaria ad Asti (coll. T. O. Semper).

This species has the same relation to *B. triquetra* as *Thylacodes melitensis*, Gm., to *T. intiotiosa*, Salis.

4. BIVONIA SUTILIS, Mörch.

T. affixa irregulariter lituiformis, fere libera; anfr. graciles, primi irregulariter planorboidei, carnei, liris expressis longitudinalibus alternatim minoribus, submoniliferis, interstitiis granulis validis, remotis, sæpe cum lateralibus confluentibus, inde scrobiculis elongato-quadratis reticulata; sculptura aperturam versus lævior vel fere evanescens; anfr. ultimus solutus, longus, albescens, varicibus duabus majoribus et duabus minoribus.

Diam. aperturæ et anfr. ult. circ. 3 m.

Hab. In littore occidentali Americæ centralis, in valva solitaria *Veneris subimbricatæ* Sow. affixa (Mus. Cuming).

This species is exceedingly like to *Bivonia semisurrecta*, Biv., but differs chiefly in the catenulated granulations of the furrows and moniliferous appearance of the liræ.

Var. α. ? MAJOR, liris 3–4 validioribus, ubique impresso-punctata.

Diam. aperturæ 7 m. (coll. Dunkeri, 222).

This specimen, on a fragment of a *Pinna*, probably from Central America, is very like a large variety of *B. semisurrecta* in the Museum of Breslau.

Var. β. TRIQUETRA.

T. corrodens, irregulariter planorbiformis, triquetra, lira dorsali distincta; rugæ et striæ incrementi utrinque sigmoideæ; liræ longitudinales obsoletissimæ vel evanescentes.

Diam. aperturæ 5 m.

Hab. Mazatlan, on a valve of a *Placunanomia* (Semper's collection at Altona).

I cannot see any notable difference between var. β and *Bivonia*

triquetra, var. *typica*; but I believe it has the same relation to *B. utilis* as *B. triquetra* to *B. semisurrecta*.

5. BIVONIA QUOYI, H. & A. Adams.

T. solitaria, laxè contorta, tenuiuscula, livido albo fuscoque variegata, arena agglutinata præsertim in anfr. primis; anfr. ultimus longus, porrectus, flexus, liris longitudinalibus obsoletis, interstitiis lirulis parvis obsoletissimis; stricæ incrementi submembranaceæ, expressæ.

Apertura circularis diam. circ. 4 m.

Cladopoda quoyi, Adams, Genera, i. p. 359, t. 39. f. 3 a.

Hab. Ad ins. Philippin. (*Mus. Cuming*).

The description is from the specimen represented by Messrs. Adams. I do not know if the authors have placed this species in the genus *Cladopoda* from a knowledge of the animal; but the shell seems to me so like that of *Bivonia semisurrecta*, that I have referred it to the present genus until the animal proves the contrary.

Var. α. LILACINA.

T. vix agglutinans, crassiuscula, aperturam versus lilacina, liris longitudinalibus granulosis; in anfr. primis rugis obliquis corrugata.

Diam. aperturæ fere $4\frac{1}{2}$ m.

Hab. Ad ins. Philippin. (*Mus. Cuming*).

One specimen a little larger and thicker than the preceding; the first whorls are lost.

Var. β. PLANORBOÏDES.

T. lilacino et albo variegata, arenulis sparsis agglutinatis, primum irregulariter planorbiformis; anfr. ultimus longiusculus, porrectus, reflexus; anfr. graciles, teretes, subæquales, lirulis remotis longitudinalibus, granulis sæpe pulcherrimis, sat approximatis; interstitiis lirula parva mediana granifera; anfr. penultimus striga longitudinali ferruginea abrupta; varicibus tribus, ultimo erecto valido.

Diam. anfr. ult. circ. $3\frac{1}{8}$ m.

? *Tubulus vermicularis*, Buonanni, Rec. p. 92. f. 20 A (sed duplo major); *Mus. Kirch.* pl. 6. f. 20 A (copy).

? *Le cor de chasse*, Favon. i. p. 669, t. 6. f. 3 (copy, but reversed and enlarged).

Hab. Ad ins. Philippin. (*Mus. Cuming*).

I do not know any shell better resembling the figure of Buonanni.

Var. γ. LAQUEARIS.

T. repens, sordide carnea; anfr. primi lividi, laqueatim torti; liræ validiusculæ, sat approximatae, graniferae, hic illic squamulis minutis; rugæ incrementi arcuatae, irregulares; apertura affixa, latere affixo plano obscuro.

Diam. aperturæ 3 m.

Hab. Ad ins. Philippin., lapillo affixo (*Mus. Cuming*).

Very similar to the typical specimen in colour, but creeping and shorter.

Var. δ . RUGOSO-SQUAMOSA.

T. alba, crassiuscula, laquearis, irregulariter spiralis; liræ latiusculæ; laminæ incrementi confertæ, undulatæ, intersectionibus squamis latis brevibus; anfr. ultimus solutus, longus, læviusculus, squamulis incrementi tenuibus parvis.

Diam. aperturæ 3 m.

Hab. Ad ins. Philippin.? (*Mus. Cuming*).

One specimen, with a few agglutinated pebbles.

Var. ϵ . STRIGATA.

T. crassiuscula, soluta, irregulariter torta, alba, postice lineis longitudinalibus duabus ferrugineis; latere affixo plano, fascia longitudinali badia, utrinque ferrugineo terminata; liræ longitudinales validæ, regulares, hic illic squamulosæ; rugæ incrementi subæquales, æquidistantes, inde interstitiis scrobiculatis; lapillis sparsis agglutinatis.

Diam. aperturæ circ. $3\frac{1}{2}$ m.

Hab. Ad ins. Philippin. (*Mus. Cuming*).

Description taken from a small detached specimen.

Var. ζ . PAPILLOSA.

T. lateraliter affixa, carnea; anfr. primi 3-4 fere regulariter planorbiformes; anfr. sequentes laqueati, obliqui, incumbentes; liræ longitudinales remotæ, papillis conicis compressis acutis sat remotis; interstitiis lirulis 1-2 minutis graniferis.

Apertura subsoluta, diam. $3\frac{1}{2}$ m.

Hab. Ad ins. Philippin.; in valva solitaria *Balani tintinnabuli?* affixa (*Mus. Cuming*).

This variety unites the preceding small and narrow forms with the following larger and broader.

Forma 1. ADSPERSA.

T. anfractibus ampliatis, lateribus dilatatis.

Var. η . CORALLIOPHILA.

T. tenuiuscula, irregulariter planorbiformis, in corallio fere semiimmersa, albescens, fasciis longitudinalibus duabus ferrugineis; latere affixo fascia badia; anfr. aperturam versus dilatati, planiusculi, latere externo margine depresso dilatato, rugis incrementi validis; latere interno et dorsali liris longitudinalibus confertis confuse granulosis; anfr. ultimus contractus, tubo aperturali porrecto, tenui, angusto, læviusculo malleato, rugis annulatis obsoletis, liris evanescentibus; intus alba, columella nitida, sulco infra mediano obsoleto; anfr. primi cinerei.

Diam. aperturæ 3 m.; diam. anfr. penult. $5\frac{1}{2}$ m.; longitudo tubi 10 m.

Serpula costalis, Chenu, Ill. t. 10. f. 7 (non absimilis).

Hab. Ad ins. Philippin. (coll. Cuming). (Specimen descriptum extat in collectione Hornbeckiana.)

In Mr. Cuming's collection is a specimen without apertural tube, attached or slightly burrowing in the very same kind of coral as Dr. Hornbeck's specimen. A detached tube, bent like a fishing-hook, about 60 m. long, and agreeing in sculpture and calibre with the apertural tube above described, is also found in Mr. Cuming's collection.

Var. θ. TRIQUETRA.

T. affixa, scaphitoïdea, albescens, tenuiuscula, latere affixo plano candido; anfr. ultimus triqueter, carinula plana mediana candida, utrinque linea castanea marginata; marginibus, præsertim externo, dilatatis; latere interno liris 2 vel 3 albis et lineis ferrugineis 2 vel 3 confluentibus; striæ et rugæ incrementi sæpe ferrugineæ, varie flexæ, in intersectionibus lirarum et carinæ præcipue incrassatæ; anfr. ultimus rectus, pone aperturam inflexus, contractus, cylindricus; apertura circularis, intus candida; anfr. primi intus castanei.

Diam. aperturæ $5\frac{1}{2}$ m.; diam. anfr. ult. fere 10 m.

Hab. Ad ins. Philippin. Specimen in fragmento *Tetracitæ* affixum extat in Mus. Cuming.

Var. ι. GRANIFERA.

T. crassiuscula, alba vel flavescens; anfr. incumbentes, obliqui, depressiusculi, aperturam versus ampliati, marginibus dilatatis; anfr. primi angusti, inferne lividi; liræ longitudinales confertæ, alternatim minores, sæpe interruptæ vel confusæ; rugæ incrementi validæ, sigmoïdeæ, sæpe undulatæ, versus marginem incrassatæ et sæpe furcatæ, granulis validis ornata; faucibus macula badia oblonga, margine castaneo; columella candida, nitida; parietes interne flavescentes (ut videtur in specimine fracto).

Diam. aperturæ 6 m.; anfr. ult. inferne 12 m. latus.

Hab. Ad ins. Philippin. ? (Mus. Cuming).

This shell looks very different from the preceding variety; but the first whorls are exactly of the same shape and bluish colour (with agglutinated minute pebbles) as in the type, but chiefly in var. γ.

Var. κ. FULGURATA.

T. spirorbiformis, latissime umbilicata; anfr. ultimus ampliatus, convexus, periphæria dilatata; liræ spirales confertissimæ, regulares, subgranosæ; lira quarta vel quinta quæque expressior, læviuscula; rugæ incrementi sigmoïdeæ, sat approximatae, utrinque incrassatæ; anfr. ultimus juxta aperturam contractus; apertura soluta, circularis; anfr. primi varicibus parvis 2 vel 3 fornicatis erectis; color pallide flavescens, præsertim periphæriam versus, fascia mediana obsoleta lactescente; lineis transversis fulguratis, aurantiacis vel fuscis, approximatis.

Diam. aperturæ $9\frac{1}{2}$ m.; anfr. vel 12 m. in latere affixo; diam. max. testæ 45 m.

Hab. Ad ins. Philippin.; specimen cum fragmento *Pinnæ incurvæ*? extat in Museo Cumingiano.

The whorls in the centre remind one of those of var. β . It looks at first glance entirely different; but it is evidently the same form as var. ι , only larger and more regularly grown.

Var. λ . PUNCTATA.

T. lituiformis, crassa, inferne planissima, affixa, superne convexa, latere externo præcipitanter declivi; liræ longitudinales remotæ, expressæ, nodulis obsoletis irregularibus, interstitiis sæpe lirula intercalante; rugæ incrementi expressæ, leviter arcuatæ; inde confuse reticulato-scrobiculata; color albescens vel fuscescens, punctis ferrugineis et lapillis agglutinatis adspersa; apertura circularis, contracta, soluta.

Diam. testæ 35–55 m.; diam. aperturæ $7\frac{1}{2}$ m.; anfr. ult. 11 m.

Serpula costalis, Chenu, Ill. pl. 10. f. 6, simillima.

Hab. Ad ins. Philippin. (*Mus. Cuming*).

The specimen shows on the underside the cast of the denudated layers of a pearl-oyster. It differs chiefly from the figure quoted in having all the whorls in one plane, and consequently having a very large umbilicus, which is open in the middle, the first few whorls being lost. This variety approaches in many respects to var. θ . *triquetra*.

Var. μ . VARIEGATA.

T. crassa, spiraliter torta; anfr. obliqui, incumbentes; latere externo dilatato; liræ longitudinales obsoletæ, rugis incrementi sæpe incrassatis et continuis decussatæ; inde fere ubique confuse reticulato-scrobiculata vel malleata; anfr. ultimus solutus, longus, tortus, erectus; color albescens, præsertim in lateribus, fascia mediana lata castanea e lineis longitudinalibus confluentibus composita, lacteo variegata, lineis ferrugineis aperturam versus remotis.

Diam. aperturæ 6 m.

Rumph. Amboina, t. 41. f. H, non absimilis.

Hab. Ad ins. Philippin. (*Mus. Cuming*); specimen in lapide affixum.

This variety approaches in colour the var. κ . *fulgurata*.

Var. ν . FLOS-LACTIS.

T. crassiuscula, irregulariter torta; anfr. contigui vel incumbentes; liræ longitudinales obsoletæ vel nodulis acutiusculis ornatae; rugæ incrementi crassiusculæ, irregulares, sæpe confluentes; latere externo fascia lata fusca vel castanea variegata, latere superiore fascia lata lactea vel pallide cyanea; anfr. primi flavescens, læviusculi.

Diam. aperturæ 7 m., speciminis minoris 3 m.

Hab. Ad ins. Philippin. (*H. Cuming*), in *Cerithio noduloso* affixa.

This variety differs chiefly from the preceding in the colours being stronger, the exterior side being of a deep chestnut-brown colour, and the upper side of a bluish white, like the preceding forms, but much more developed. A smaller specimen, attached to the same shell, with agglutinated pebbles, differs chiefly from the type in being thicker in the shell.

? Var. ξ. (ALETES).

T. solida, spiraliter torta, lateraliter affixa; anfr. contigui, planiusculi, incumbentes, obliqui, suturis dilatatis; anfr. ultimus longus, solutus, fere semiteres, aperturam versus reflexus, liris longitudinalibus confertis, sæpe connatis et læviusculis, leviter undulatis; rugæ incrementi parvæ, approximatae, suturam versus incrassatae, leviter sigmoideæ et sæpe furcatae; interstitia lirarum reticulato-scrobiculata, fasciis longitudinalibus angustis approximatis 4-5 aurantiacis; sutura alba; anfr. ultimus sordide livescens; columella candida, nitida, intus aperturam versus fuscescens.

Diam. aperturæ circ. 6 m.; anfr. ult. $7\frac{1}{2}$ m.; anfr. penult. circ. 10 m.

Hab. —? (*Mus. Cuming*).

This variety is not unlike *Vermetus cercus*, Carp., chiefly so in shape; but the sculpture and colour remind one of var. η. *corallio-phila*. The affixed side is thinner, white, and shows marks of a pearl-oyster.

6. BIVONIA CONSTRICTOR, Mörch.

T. crassa, repens, laqueatim contorta, sordide lactea, primum roseola; anfr. convexusculi; latere externo dilatato; liræ latæ, parum prominentes, subapproximatae, versus marginem externum omnino evanescentes; rugæ incrementi prominentes, irregulares, leviter sigmoideæ, in intersectionibus interdum obsoletissime nodulosæ; anfr. ultimus pone aperturam contractus, breviter cylindricus, varicibus duabus æquidistantibus crassis brevissimis arcuatis; intus fere ubique castanea; apertura soluta, circularis, periphæria interna alba.

Diam. apert. 7 m.; diam. anfr. ult. circ. 10-12 m.

Serpula arenaria, Bowd. Elements, ii. f. 130, non absimilis.

Hab. Australia (*Mus. Cuming*).

One specimen, nearly half sunk in the surface of a calcareous conglomerate, with an imbedded spine of an *Echinus*: it seems to be somewhat corroding. The last whorl shows two varices, the first at the same distance from the second as that is from the aperture. The figure quoted is not unlike the principal specimen in the group, but the apertural tube is rather long.

7. BIVONIA GOREENSIS, Gm.

T. teres, cancellata, flava, intus cornea, 8-9 pollices longa, striis elevatis, longitudinalibus confertis (Gm).

La longueur de sa coquille est de 8 à 9 pouces, et sa largeur de 3 à 4 lignes. Elle est contournée plus irrégulièrement que le *Vermet* et fait un peu moins de spires, qui vont aussi de droite à gauche. Sa surface est relevée de 50 petits filets longitudinaux, fort serrés, et traversés par d'autres filets semblables, qui forment un treillis extrêmement fin. Son ouverture ne s'élève pas d'un demi pouce au-dessus des spires. Elle s'incline toujours un peu sur le côté. Elle est jaune au dehors, et de couleur de corne au dedans.

Animal.—Les cornes ont deux fois plus de longueur que de largeur. Son pied paraît comme plié en deux à son extrémité. C'est dans ce pli qu'est placé l'opercule qui est si petit qu'on a de la peine à le distinguer sans le secours du verre lenticulaire. Il n'a guère plus d'un huitième de ligne de diamètre. Le manteau est bordé tout autour de 12 petits tubercules jaunes. La tête, les cornes, le pied et le manteau sont bruns pointillés de jaune et de rouge : le reste du corps est blanc-de-corne dans sa moitié supérieure et blanc-de-lait taché de brun dans l'autre moitié.

Le Dofan, Adans. Sénégal, p. 164, t. 11, f. 3.

Les Boyaux de mer d'Afrique, Fav. i. p. 651, t. 6, f. E 2.

Serpula, no. 27, Schröter, Einl. ii. p. 566.

Serpula goreensis, Gm. 3745.

Vermetus goreensis, Daudin, Rec. 1800, p. 35.

Serpula goreensis, Dill. ii. p. 1077. no. 20; Wood, Index, t. 38, f. 19 (copy).

Vermetus goreensis, Blv. Dict. lvii. p. 325.

Vermetus (Dofania) goreensis, Mörch, Journ. Conch. viii. p. 26.

Hab. "Cette espèce s'attache par monceaux ronds d'environ un pied de diamètre, sur les coquillages et sur les morceaux de bois que le hasard a fixés au fond sablonneux et coquillier de la rade de l'île de Gorée."—Adans.

If the description of the lid is correct, and not erroneous like the observations of Bivona on *Thylacodes polyphragma*, it must be referred to this genus. In the Royal Museum is a large flat crust agreeing with the description of Adanson, but which looks more like a true *Vermetus*.

Gen. THYLACODES, Guettard, 1774.

T. plerumque solitaria, repens, quandoque spirata, sæpe liris 3-5 longitudinalibus nodulosis; apertura circularis, nunquam contracta. Testa nuper nata bulimoides, apertura antice subeffusa.

Animal tentaculis breviusculis, nodulo oculifero juxta basin externo; filamenta pedalia subulata, longa [Phil.], contractilia, sulco profundo longitudinali interno, mammilla basali intermedia perforata; propodium planum, parvum, antice recte truncatum, angulis utrinque productis; mesopodium spatulatum, medio concavum, antice mammilla valida subcompressa; metapodium magnum, cylindricum, postice truncatum, rugis transversis subtilissimis (secundum cl. Gray radiatim sulcatum), utrinque subulatum, membrana brevi elongata recurrente utrinque cum capite frenis conjunctum; operculo nullo (Mörch).

Serpula, pp., L. S. N. ed. x. pp.*

Tulaxodes, Guettard, Mém. 1774, vol. iii. pp. 143, 152.

Thylacodes, Agass. Nomencl. p. 370, et Herm. Index, ii.

Serpulus, Montf. 1810, Conch. Syst. pl. 22, sed non descr.

Serpulæ concameratæ, Schmidt, 1818, Beste Einricht. p. 215.

? *Lemintina*, Risso, 1826, Hist. iv. p. 114.

Serpulorbis, Sassi, Journ. Ligust. di Sc. Sept. 1827, v. p. 482 ; Sassi, Fér. Bull. 5. xix. 1829, p. 123.

Cellularia, Schmidt, Möll. Cat. Mus. Gotha, 1833, p. 70 (non Pallas).

? *Hatina*, Gray, Synops. Brit. Mus. 1842, pp. 62, 90 ; 1844, p. 62.

Serpuloïdes, Gray, Figures, 1850, iv. p. 83 ; Guide, 1857, p. 127.

Guettard established this genus chiefly on account of the internal septa, the presence of which in his genus *Campulotus* (*Vermetus*, Adans.) was unknown to him. The latter genus was distinguished by regular spiral whorls, and included not only *Vermiculus*, but even *Scala scalaris*, L. Guettard states (*l. c.*, p. 152) that he chiefly founded his genus on the genus *Certium* of Gualtieri, which contains principally the large Mediterranean species.

Lemintina (Risso) is generally regarded as a badly observed species of this genus, from which it differs in the want of the pedal filaments. The curious feather-like bodies represented by Risso are described thus :—"La bouche est fendu en long, placé sur un trompe ou mamelon conique au sommet de la tête, laquelle est surmontée d'un petit panache blanc, qui sont les branchies." I believe this supposed gill is the lingual membrane, which seems to me very probable upon comparing the description with the description of the tongue of *Vermetus* by Lacaze Duthiers, in 'Annales des Sciences,' 1859, xi. p. 208.

The genus *Hatina*, Gray (*olim*), founded on *Vermetus inopertus*, Rüppel, has no pedal filaments ; but it is possible that the male organ is in reality one of the filaments, the other either being overlooked or forgotten by the artist. But it must be observed that the filament represented is situated in the place which the male organ usually occupies in allied families. V. Siebold denies entirely the existence of an exterior male organ ; and no author has described it since.

The radiating lines on the tip of the metapodium, represented by Philippi, but not described, and regarded as a generic character by Dr. Gray, are not to be seen on specimens in spirits ; they are probably nothing more than coloured lines. The lid is wanting, but Bivona mentions that it has an "operculum minimum punctiforme." A similar minute operculum, concealed in a fold of the foot of the Dofan, is described by Adanson. The animal appears, like the other Vermetidæ, to be viviparous. The egg-cases and larvæ are described by Philippi (Wiegman's Archiv f. Naturg. 1839, p. 128), and illustrated by a figure from Scacchi, but more extensively by Schmarda

* "Sæpe isthmis integris passim intercepta." But the animal is described as an Annelid.

(Wiener Denkschriften, 2. Abth. 4. Band. 1852, p. 135, pl. 10). The latter author has mistaken the ear-capsules for the eyes (Troschel, Jahresbericht, 1852). The spermatozoa (or perhaps the spermathecae) are described by Siebold (Wirbellose Thiere, p. 344); in the same work (pp. 341, 345) are given some observations on the renal and mucous organs. Troschel has represented the teeth of *T. polyphragma* (Sassi) and *T. decussatus* (Gm.), which chiefly differ from the teeth of *Siphonium nebulosum* (Dill.) in having a little tooth more on each side of the rachial plait. The structure of the maxilla is represented by the same author (Gebiss, p. 155, pl. 13. f. 3).

1. THYLACODES POLYPHRAGMA, Sassi.

T. solitaria, irregulariter spiralis; anfr. sæpe contigui teretiusculi, sutura dilatata, liris parvis longitudinalibus confertis sæpe alternatim minoribus, confuse ruguloso-granosis, sæpe liris validis 3-4, nodulis remotis et punctis ferrugineis interpositis; anfr. ultimus longus, leviter tortus, gracilis; color sordidus e fulvo et flavido albescens.

Diam. aperturæ 14 m.

Animal capite, pede et limbo pallii purpureis aut purpureo-atris, punctis albis maculisque sulphureis pictum; reliquum corpus pallidum albescens; tentacula superiora brevia, crassa, conica, non retractilia, inferiora cylindrica, filiformia, acuminata, pallide annulata (Phil.).

Serpula arcuaria, L. Knorr, Vergn. iv. p. 23, vol. i. t. 29. f. 5, 1769.

Serpula intestina, Salis-Marschlii, Reise, p. 358, 1793.

Serpula arenaria, Lam. v. p.

Serpulorbis polyphragma, Sassi, l. c., 1827; Fér. Bull. 1829; Poli, t. 1. f. 17 (Philippi); Delle Chiaje, t. 57. f. 1-9.

Vermetus gigas, Gray, Figs. t. 58. f. 6 (copy).

Serpuloides arenaria, Gray, Figs. iv. p. 83.

Vermetus gigas, Phil. Chenu, Ill. pl. 4. f. 5.

Dentalium intestiniforme, Lin. 1859; Hanl. MS. of Mus. Utr. p. 49.

Serpulorbis gigas, Adams, Gen. t. 39. f. 2^a (optime).

Var. α. ALETES.

T. lateraliter affixa, fere regulariter spiralis; anfr. obliqui, contigui incumbentes; anfr. ultimus interdum solutus, longus.

Vermicularia lineolata, Gravenh. Tergest. p. 57. no. 3 (ex spm. orig.).

Vermetus gigas, Biv. Nuov. Gen. p. 9, t. 2. f. 1, 2 (Phil.); Phil. Enum. i. p. 170, t. ix. f. 18, and ii. p. 143.

Serpuloides arenaria, Gray, Figs. iv. p. 83, t. 57. f. 2 (copy).

Serpulorbis gigas, Biv. Ad. Gen. i. t. 39. f. 2 (copy)

Hab. In mare Mediterraneo; Tarento (*Salis*); Sicilia (*Phil.*); Genoa (*Sassi*).

Var. β . AMPLA.

T. laxa contorta, tenuiuscula; anfr. vix contigui, teretes, ampli, primum depressiusculi, angulo acuto aperturam versus evanescente; anfr. ultimus solutus, erectus, breviusculus; liræ longitudinales parvæ, approximatae, rugis incrementi subæqualibus decussatae, inde interstitiis subtiliter punctato-scrobiculatis; anfr. ultimus superne liris duabus tribusve interruptus, nodulis compressis elongatis. Color albus, præsertim intus, superne flavescens in anfr. primis pallidissime lilacinus.

Diam. apert. 27 m.; long. tubi aperturalis 30 m.; diam. anfr. penult. circ. 15 m.

? *Vermetus siphon*, Lam., Chenu, Ill. t. 7. f. 3, minor.

? *Serpulorbis siphon*, Chenu, Man. p. 320. f. 2306 (copy).

Hab. In ins. Melitens. (*Coll. nostra*). Specimen in lapide molli flavo affixum.

2. THYLACODES MELITENSIS, Gm. 1791.

T. teretiuscula, contorta, umbilicata, decussatim striata, costis longitudinalibus nodulosis, intus lævi polythalamia (Gm.).

Die vielkammerige gewundene Seeschlange, Schröter, Einl. ii. p. 576, t. 6. f. 19, 1789; Schröter, Neue Litteratur, 1785, ii. p. 216.

Hab. Fossilis in Melita inventa, gyris 2 primis recta sibi impositis (Gm.). *Formatio tertiaria.*

Var. β . REPENS.

1716. *Exuvia serpentis in lapides conversa*, Besler, Rariora, t. 36. f. 102.

1817. *Serpula grandis*, Link, Verz. Rostock, p. 23 (Lang, Lapid. t. 50. f. 3).

This species is chiefly distinguished from the preceding by its great thickness; the granules of the liræ are of a vesiculous nature.

Var. γ . ITALICA.

Vipera petrificata, Worm, Mus. 1655, p. 90.

Wurmformige Meerröhre, Knorr, Petrif. 2. Th. 2. Bd. p. 288. t. 1. γ ; (*Tubus aperturalis*), Knorr, *ib.* p. 298, t. 1 a. f. 13.

Serpula polythalamia, Brocchi, Subapp. 268.

Serpula dentifera, var. c., Lam. v. p. 367. no. 24.

Serpula arenaria, Bronn, Hal. Tertiärg. 1831, p. 65.

Serpula decussata, Defr. Dict. t. xlviii. p. 571 (Piémont, Bordeaux).
Vermetus arenarius, Hörnes, Geol. Reichsanst. p. 200, t. 20. f. 5, 6; Griffith, A. Kingd.

Hab. Fossilis in form. tert. Italiæ borealis.

3. THYLACODES DENTIFERUS, Lam.

T. teres, contorta, costellis longitudinalibus duabus tribusve dentiferis.

"Cette espèce devient assez grand."—Lam.

Var. ζ , *testis majoribus subsolitariis* (Mus. no.), Lam.

Serpula dentifera, Lam. v. p. 367. no. 24.

Magilus dentiferus, M.-Edw., Lam. v. p. 625.

Vermetus dentiferus, Rouss., Chenu, Ill. t. 4. f. 1 (med. et sup.).

Vermetus dentiferus, Blv. Dict. Sc. t. lvii. p. 325.

Hab. Les mers de l'Asie australe (Lam.).

"Tube assez grand, à coupe circulaire, contournée irrégulièrement, à stries d'accroissement grossières, rugueuses, et d'autres fois pourvu de deux à trois petites côtes ou carènes longitudinales, dentifères, ou mieux tuberculeuses. Couleur d'un rouge brun, mais quelquefois blanche. Cette espèce, qui offre une première variété, dont les tubes sont subsolitaires, et une autre où ils sont subanguleux et agglomérés, vient des mers de l'Asie australe. Elle n'est peut-être pas distincte de la *S. arenaria*, qui, comme elle, n'est qu'un Vermet. Un individu de la collection de M. Lamarck m'a même offert son opercule corné." —Blainv. Dict. Sc. t. xlvi. 1827, p. 558.

In Mr. Cuming's collection are several specimens from Australia which seem to me to agree pretty well with the above description, but which differ from the upper figure of Chenu in having less prominent nodules. The lid mentioned by Blainville is very likely found in the var. δ . of Lamarck, which I suppose is *Siphonium nebulosum*, Dillw.

Var. α . REPENS.

T. repens, affixa, tenuiuscula, flavescens; liræ longitudinales parvæ, expressæ, subremotæ, liris incrementi minoribus subundulatis approximatis decussatæ; inde subtiliter reticulata; liræ tres prominentiores, inæquales, nodulis linearibus remotis, maculis linearibus fuscis interpositis; rugæ transversæ validæ, irregulares; varices breves, irregulares, sæpe 3-4.

Diam. aperturæ circ. 9 m.

Hab. Australia; Swan River, creeping on a *Cardium*; Cape Upstart (Mus. Cuming).

The *Vermetus dentiferus* (Q. & G.) approaches this variety in shape, but looks very different in colour and in the form of the aperture. The following species is very likely only a narrow form of the type, depending on its being agglomerated.

4. THYLACODES SULCATUS, Lam.

T. teres, inferne contorta, subglomerata, antice porrecta; costellis longitudinalibus numerosis, subdentatis (Lam.).

Serpula sulcata, Lam. v. 1818, p. 367. no. 22, ed. 2. v. p. 625; Blainv. Dict. t. xlvi. p. 558.

Vermetus novæ hollandiæ, Rouss., Chenu, Ill. pl. 1. f. 4a, vix 5.

Hab. Les mers de la Nouvelle Hollande (Lam.); Kangaroo Island (Mus. Cuming).

The description and locality of Lamarck seem to me to agree perfectly with the shell represented by Chenu, which has also the same calibre as the *Dofan* (Adanson), quoted, with a query, by Lamarck. This shell differs only from the preceding species in its smaller calibre, very likely dependent on its being agglomerated

detached specimen shows a transition state. Fig. 5 of Chenu looks entirely different, and more allied to *V. annulatus*, Rouss.

5. *THYLACODES TURONIUS*, Rouss.

Vermetus turonius, Rouss., Chenu, Ill. pl. 4. f. 44.

Hab. — ?

According to the specific name, it would be from Touraine; but, from the colours in the aperture, it would seem to be a living shell.

6. *THYLACODES ANNULUS*, Rouss.

T. repens, laquearis, longitudinaliter subtiliter striata; anfr. ampliati: postice carina brevi crenulata (ex icone).

Vermetus annulus, Rouss., Chenu, Ill. t. 1. f. 8.

Hab. — ?

I do not know of any shell like the figure; but it seems to be a good species.

7. *THYLACODES RIISEI*, Mörch.

T. solitaria, repens, laqueatim torta, tenuiuscula, albescens, carneo vel pallidissime lilacino variegata; anfr. ampli, præsertim aperturam versus, liris longitudinalibus parvis planis approximatis alternatim minoribus, superne liris tribus remotis, tuberculis compressiusculis elongatis, sæpe acutis, interdum muticis, confluentibus, punctis ferrugineis interpositis; striæ incrementi minutæ in intersectionibus lirarum minutissime imbricatæ; latere affixo irregulari, sæpe fascia castanea lata longitudinali.

Diam. aperturæ circ. 15 m.

Desh. *Traité de Conch.* t. 79. f. 16, non absimilis.

Hab. Ins. S. Thomæ, Antillarum, Riise, Hornbeck (*Mus. reg. et Univ.*).

Var. α . *LIMACELLA*.

T. repens, solidula, candida, hic illic pallide carnea; anfr. subæquales, lirulis longitudinalibus latiusculis planis confertis, liris latis 7-8 remotis undulatis vel obsoletissime nodulosis; rugæ incrementi juxta margines validæ, inde lateribus fluctuatis; striæ incrementi obsoletissimæ; apertura subovalis, affixa.

Diam. aperturæ $6\frac{1}{2}$ lat., 8 m. alt.

Hab. Ins. Antill., in *Ostrea limacella*, Lam., affixa (*Mus. Cuming*).

This variety corresponds very well with the first whorls of the type. It differs chiefly by greater solidity and more regular liræ, but otherwise looks very different.

Var. β . *MÜHLENPFORDTII*.

T. albescens, solidula, agglomerata, primum repens vel irregulariter spiralis; anfr. ultimus porrectus, teres, longus, leviter tortus, læviusculus, rugis et striis incrementi inæqualibus; liræ longitudinales expressæ, approximatae; superne seriebus tribus nodulorum compressorum; liræ incrementi undulatae, approximatae; interstitiis lirarum irregulariter scrobiculatis.

Diam. aperturæ circ. 6 m.

V. novæ hollandiæ, Chenu, Ill. t. 1. f. 4, quoad staturam.

Hab. Mexico (*Dr. Mühlenpfordt*) (*Coll. Dunkeri*).

Described from a dead group composed of about six or seven specimens. The first whorls are so like those of the former variety, that I do not think it can be specifically different. In shape it looks not unlike *Bivonia semisurrecta*. In Mr. Cuming's collection is a specimen labelled "Philippines," which does not seem to differ from it materially.

8. THYLACODES ERUCIFORMIS, Mörch.

T. tenuiuscula, repens, laqueatim contorta, pallide violacea, albo et flavesciente variegata, maculis adspersis paucis castaneis, liris longitudinalibus parvis obsoletissimis, superne liris tribus expressis remotis inæqualibus nodulis asperis parvis; striæ incrementi obsoletæ; anfr. ultimus varice brevi; apertura reniformi-ovali, latere interno affixa.

Diam. apert. 7-8 m.

Hab. California, on *Crucibulum?* *umbrella*, Desh., var. (*Mus. Cuming*).

The small sharp nodules of the three dorsal rows are strongest in the exterior row, reminding one of those of *Cardium echinatum*. This species is the analogue to the preceding from the east coast.

Var. α . LUMBRICELLA.

T. repens, recta, primum laxè contorta, arenulis agglutinatis cinereo et violaceo variegata, fasciis abruptis longitudinalibus vel strigis latis transversis castaneis; liræ longitudinales sat remotæ, sæpe alternatim minores, interstitiis sæpe scrobiculato-reticulatis; liris medianis tribus interdum expressis vel crassis, granulis regularibus æquidistantibus; rugæ incrementi expressæ, superne arcuatæ, lateraliter incrassatæ, validæ, confertæ, retusæ.

Diam. apert. circ. $6\frac{1}{2}$ m.

Voy. de Venus, pl. 11. f. 2. fig. min. (Chenu, F. W. f. 2, copy) quoad staturam.

Hab. California; 10-12 specimens crowded on a *Margaritifera* (*Mus. Cuming*).

Var. β . ERYTHOSCLERA.

T. ut præcedentis sed crassa, alba; lineæ incrementi ferrugineæ, confertæ; interstitiis fenestratis.

Hab. California; on a young *Margaritifera* (*Mus. Cuming*).

This shell is very like to *Bivonia quoyi*, var. *variegata*, in respect of colour and the agglutinated sand; all the specimens are creeping, with affixed apertures.

9. THYLACODES NATALENSIS, Mörch.

T. solitaria, crassa, irregulariter planorbiformis; anfr. plerumque contigui, teretiuseuli, complanati, latiusculi, lateribus rotundatis, lapillis, præsertim inferne, sparsis agglutinatis; liræ longitudinales subremotæ, interstitiis obsoletissime decussatis, rugæ

incrementi sæpe validæ, irregulares; color albus, pallidissime violaceo et flavo variegatus; anfr. primi intus fusc.

Alt. aperturæ $6\frac{1}{2}$, lat. 8 m.

Hab. Natal; specimen detritum communicavit T. Collins. The section of the whorls is transversely oval.

10. THYLACODES MASIER, Desh.

"Sa coquille est fort épaisse, longue d'un pied, large de 8 à 9 lignes, marquée de 20 cannelures longitudinales extrêmement fines et terminée par elle-même en trois spires assez irrégulières, dont celles du sommet se trouvent au-dessous des autres. Son ouverture ne s'élève pas au-dessus des spires. Elle est grise, fauve, ou couleur de chair au dehors, et couleur de corne au dedans."—*Adans.*

Le Masier, *Adans.* Sén. 1757, p. 105. no. 5, tab. 11.

Vermetus arenarius, *Daudin*, 1800, p. 35.

Tuyaux solitaire, *Favanne*, i. p. 600.

Serpula siph, *Lam. Pp.*, v. p. 25.

Vermetus siph, *Blainv. Dict. Sc.* 1828, t. xlvii. p. 325.

Vermetus masier, *Desh.* ix. p. 65, 1843.

Hab. Cap de Verd, extremely rare (*Adanson*).

I have never seen this species.

11. THYLACODES BRASILIENSIS, Rouss.

T. magna, solitaria, primum spiralis, liris remotis nodulosis; anfr. ultimus solutus, longus, erectus, leviter arcuatus.

Diam. aperturæ 30 m. (ex icone).

Vermetus brasiliensis, *Rouss., Chenu*, Ill. pl. 5. f. 5.

Hab. Brazil, according to the specific name.

From the shape of the aperture, it will probably prove to be a *Siphonium*.

12. THYLACODES COLUBRINUS, Bolten.

T. plerumque solitaria, crassa, picea, spiraliter torta; anfr. ultimus solutus, teres; anfr. primi teretiusculi, latere affixo acutangulo, liris longitudinalibus parvis remotis, interstitiis lirulis minoribus inæqualibus; apertura intus nigra.

Diam. aperturæ circ. 20 m.

Tubuli vermium perpulchri, *Seba*, iii. t. 93. f. 4, 5, 6, 7 (reversed).

Dinotus, *Guettard*, Mém. iii. p. 135. no. 10.

Le Cor de Chasse, *Favanne*, i. p. 600 (*Seba*, f. 6, 7).

Le minime, *Fav.* i. p. 600 (*Seba*, f. 4, 5).

Dicke schwartze Wurmköcher, *Knorr*, 1771, v. p. 33, t. 22. f. 1 (typus).

Le grand solitaire, *Favanne*, i. p. 600.

Serpula colubrina, *Bolt. Verz.* 1798, p. 50. no. 884.

Hab. India orientalis?

In the Museum of the University of Copenhagen are several specimens of this shell, one of which may be that figured by *Seba*, fig. 5.

Var. α . VIOLACEO-FUSCA.

"*T. irregulariter contorta, lineis elevatis interruptis, obsoletiusculis, colore violaceo-fusco.*"—Sow.

More than an inch wide in some parts (Sow.), 1 inch (Wood).

Serpula fuscata, Geo. Humphr. Coll. (Sow.); Sow. Tank. Cat. 1825, no. 22. p. 93; Brit. Mus. Wood, Supp. t. 8. f. 3. 1828.

Var. β . ATRA.

T. solitaria, crassa, extus et intus picea, spirorbiformis; anfr. primi periphæria acuta, latere affixo plano; anfr. ultimus solutus, teres, declivis; liræ longitudinales parvæ, remotæ, juxta umbilicum lira compressa leviter undulata validiuscula; interstitia lirulis 5-6 inæqualibus, lira mediana majore; rugæ incrementi irregulares, leviter flexæ, marginem versus incrassatæ.

Diam. aperturæ $15\frac{1}{2}$ m.

Solen, Rumph, Amb. t. 41. f. L.

Solen clibaniformis, Petiv. Gazophyl. i. t. 20. f. 13 (copy).

S. corallorum lævis clibaniformis, Klein, Tub. Mar. t. vii. i. β . p. 5.

Tubulus vermicularis clibaniformis, Mart. i. pp. 24, 44. f. 10.

Vermetus ater, Rouss., Chenu, Ill. pl. 5. f. 3.

Siphonium ater, Chenu, Man. p. 320. f. 2294 (copy).

? *Serpula ochrea*, Gm. S. N. 3744. no. 19.

Hab. Ins. Philippin.

In Mr. Cuming's collection is a specimen growing on a large *Vermetus cereus*, nearly of the size of that figured in Born's 'Museum,' p. 435. All the figures are taken from specimens without apertural tube.

Var. γ . ALBINA.

T. præcedenti simillima, sed differt anfr. ultimo prælongo torto, albo-cinereo et nigricante variegato; anfr. primi badii, strigis et fasciis transversis albis; apertura intus alba; faucibus castaneis.

Diam. aperturæ $17\frac{1}{2}$ m.

Hab. Ins. Philippin (*Mus. Cuming*).

Very like the preceding variety in sculpture and shape, but more slender; the brown and blackish colour become mixed with white towards the aperture, which outside and inside is surrounded by a broad, pure white band.

Testa semiadulta?

? *Siphonium giganteum*, Adams, Gen. t. 38. f. 7 a.

? *Siphonium carinatum*, Q. & G., *ibid.* p. 371. lin. 17.

The figure quoted is perhaps from a young specimen of this species. The var. α . of *Siphonium margaritarum* looks, also, very like it, and will perhaps have to be removed to this genus.

Var. δ . AGGLOMERATA.

T. contorta, picea, agglomerata, aperturam versus tenuiuscula; apertura subsoluta.

Diam. specim. maximi 12 m.; diam. specim. minimi 8 m.

Hab. Ins. Philippin (*Mus. Cuming*). A rolled group, composed of about fifteen specimens, in some of which the aperture forms a very short tube.

Var. *c.* LÆVIUSCULA.

T. solitaria, crassa, spiraliter torta; anfr. duobus contiguis, latere externo angulato; anfr. ultimus angustus, longus, teres, leviter flexus; laminæ incrementi appressæ, irregulares, localiter valde arcuatim reductæ; color badius vel castaneus, variegatus: liræ longitudinales desunt, si excipias vestigium obsoletum in anfr. primo.

Diam. aperturæ circ. 10 m.

Tubuli vermium perpulchri, Pp. Seba, t. 93. f. 9 (optime).

Le Tuyau trompette, Favanne, i. p. 596.

Hab. In India orientali (*Mus. Spengler*).

This specimen has narrower whorls than any of the preceding varieties. It has evidently grown in the cleft of some *Astræa*, showing just the same impressions as represented by Seba, and which Guettard (Mém. p. 153) has mentioned as "le réseau." The striæ of growth are very strongly bent backwards in the places where the shell has been pressed by the coral.

13. THYLACODES? IMBRICATUS, Dkr.

T. solidiuscula, antice subrecta et libera, vel toto ventris latere incumbens, pallide fusca, striis costisque longitudinalibus subimbricatis instincta (Dkr.).

Vermetus imbricatus, Dkr. Mal. Blätt. Jan. 1860, p. 240. no. 59; Dkr. Moll. Japon. 1861, p. 17. no. 80, t. 11. f. 18.

Hab. Japonia, Dr. Nuhn (*Mus. Heidelb.*).

Duo specimina extant ad basaniten paullo porosum affixa. Testa eorum solidiuscula, turbinata, altera antice subrecta et libera, altera toto ventris latere incumbens et lapidi adnata. Utrumque specimen maximam partem decoloratum est et erosum, sed alterum eorum aperturam versus omnino illæsum, colore fusco costisque longitudinalibus imbricatis instructum, qua nota a *V. gigante*, Biv., differre videtur, quem nunquam imbricatum invenimus, quamvis mirum in modum variare soleat ut omnes ejus generis species. Tubus plane teres, intus lævigatus et cæruleo-lacteus. Pars testæ in lapide insidens irregularis et subtrigona est ut *Vermetus gigas*.

This species is perhaps a *Siphonium*.

14. THYLACODES SCABER, Gravenh., 1831.

T. irregulariter spirali, tuberculis parvis in lineas longitudinales dispositis, scabra (Gravenh.).

Diam. aperturæ 4 lin. (Gravenh.).

T. irregulariter planorbiformis; anfr. primi repentes, laqueatim contorti; anfr. teretes, liris longitudinalibus expressis planiusculis nodulis elongatis postice contractis unde leviter undulatis; interstitiis angustis lirula intercalante; liræ incrementi parvi, rugæ transversæ sæpe validæ, irregulares; latere affixo inæquali

noduloso liris destituto; apertura circularis, subsoluta; color albus, punctis ferrugineis paucis obsoletissimis; faucibus juxta aperturam macula castanea; hic illic lapillis agglutinatis.
(Descriptio ex specimine originali Musei Wratislaviensis.)

Vermicularia scabra, Gravenh. Tergest. p. 55. no. 2.

Hab. Ignot.; Lusitania?

The locality is very doubtful, as most of the species described in the work quoted, according to the original specimens, for the loan of which I am indebted to Professor Grube, are from the West Indies. The brown spot in the aperture and the size of the shell remind one of *Siphonium nebulosum*; but the sculpture is quite different, and in this respect it approaches to the next species. In the collection of Charles VIII. is a specimen with a long apertural tube, probably from Portugal, which is very like it.

15. THYLACODES DECUSSATUS, Gm., 1791.

T. teres, decussatim striata, subrugosa, flexuosa, sanguinea, intus lævis alba.—Gm.

Vermiculus rufescens leviter striatus sive cancellatus, Lister, t. 547. f. 4.

Vermiculus barbadensis tortilis fuscus, Mem. for the Curious, 1708, p. 126. no. 32; Petiver, Gazophyl. i. t. 153. f. 9 (copy).

Tubulus vermicularis testaceus, Mart. i. f. 17 (copy).

Le Bois de Charme, Favan. i. pp. 597, 652, t. 6. f. L (copy).

Serpula no. 8, Schröt. Einl. ii. p. 558.

Serpula decussata, Gm. S. N. p. 3745. no. 21; Dillw. p. 1082; Wood, Index, t. 38. f. 30.

? *Tubulus marinus*, Gualt. t. 10. f. 10.

Serpula, Humphr. Conch. t. 10. f. 15, 15 a.

Vermiculus, Da Costa, Elem. p. 284, t. 2. f. 7 (copy).

Vermicularia glomerata, var. 2a, d, Gravh. Tergest. pp. 60, 61, pp.

Vermetus (Dofania) decussatus, Mörch, J. de Conch. viii. p. 34.

Serpulorbis, sp., St. Jan., Troschel, Gebiss, p. 155, t. 13. f. 2, 3 (maxilla et lingua).

Hab. I. Barbadoes (Lister); St. Thomas (Krebs, Riise, Hornbeck).

T. crassiuscula variegata, solitaria; anfr. teretes, soluti vel interdum contigui et tum inferne plani; liræ longitudinales regulares, expressæ, latiusculæ, alternatim minores, interstitiis sæpe lirula parva; striæ incrementi sæpe submembranaceæ, in intersectionibus arcuatæ vel squamulosæ, remotæ, inde interstitiis fenestratis; rugæ transversæ validiusculæ, irregulares, inde lateribus fluctuatis; color valde variabilis, latere affixo plerumque castaneo, latere superiore albo, maculis punctisve sæpe transversim confluentibus castaneis vel flavis, sæpe unicolor castaneus, intus infumatus.

Diam. aperturæ circ. 6 m.

Animal filamentis pedalibus contractilibus breviusculis basi dilatatis; mesopodium sulco profundo longitudinali divisum; metapodium truncatum, subcirculare, transversim subtiliter rugosum, centro impresso, utrinque freno cum capite conjunctum. Color

saturate rufus, præsertim superne, margine pallii linea flava notato (ex icone Oörstedii).

Var. β . TENUIS.

T. tenuiuscula, albescens, liris longitudinalibus validioribus remotis, interstitiis liris tribus inæqualibus; striæ incrementi flavæ, leviter undulatæ.

Diam. aperturæ circ. 6 m.

Vermicularia glomerata, Gravenh. Tergest. p. 60.

Jun.? *Vermicularia scabra*, Gravenh. Tergest. p. 56 (two fragments).

Hab. I. S. Thomæ (*Coll. nostra*).

Var. γ . INTERMEDIA.

T. tenuis, alba, liris longitudinalibus obsoletissimis, striis incrementi pallide flavis; fasciis pallidissimis longitudinalibus juxta aperturam.

Diam. aperturæ 5 m.

Hab. Ins. Jamaica (*Mus. Cuming*).

This shell is a good transition between the type and

Var. δ . LÆVIGATA.

T. solitaria, crassa, solida, lævigata, liris destituta, candida, interdum aperturam versus castanea vel badia; striæ et rugæ incrementi obsoletissimæ; anfr. ultimus plerumque porrectus, intus flavescens vel castaneus.

Le Villebrequin, Favon. i. p. 598, t. 5. f. G.

Serpula proboscidea (ochracea et alba), Gravenh. Tergest. p. 78.

?*Vermetus porites*, Rouss., Chenu, Ill. pl. 2. f. 3, d, e.

Hab. I. S. Thomæ, in coralliis (*Heteroporis*) sæpe una cum *Siphonio nebuloso* (*Mus. Cuming et nostro*).

This shell looks so different from the type, that I should not venture to put them together if I had not compared numerous specimens, in some of which the difference of sculpture and colour were present in one and the same individual. The tubes show frequently a deep channel at the affixed side, being the cast of a branch of a coral.

Var. ϵ . PHILIPPINENSIS.

T. crassiuscula, laqueatim contorta; anfr. inferne plani, lateribus dilatatis, badii vel castanei, superne albescentes punctis flavis transversaliter confluentibus; liræ longitudinales nodulis minutissimis, aperturam versus evanescentes; interstitia lirulis 1 vel 2 inæqualibus; striæ incrementi regulares, leviter undulatæ, pulcherrimæ.

Diam. aperturæ $7\frac{1}{4}$ m.

Hab. Ins. Philippin. (*Mus. Cuming*).

This shell seems only to differ from the type in its larger calibre and in the beauty of the striæ of growth.

Var. ζ. BADIA.

Differt a præcedente T. angustiore crassiore et colore badio.

Diam. aperturæ 4 m.

Hab. I. Philippin. (*Mus. Cuming*, specimen detritum).

16. THYLACODES SQUAMIGERUS, Carp.

T. majore, flavido-albida, solute spirali, plerumque glomerata; superficie costis spiralibus, squamis instructis, costulis pluribus intercalantibus; squamulis minoribus; squamis et squamulis imbricatis; interdum aperturam versus sculptura obsoleta (Carp.).

Aletes squamigerus, Carp. Proc. Zool. Soc. 1856, p. 226; Carp. Report, p. 324.

Hab. St. Barbara (sp. magn. glomer. in *Mus. Nuttall*); St. Diego (*Mus. Gould*).

A fine group of this shell is in Mr. Nuttall's collection. It agrees in the main with the Mazatlan species, but differs in colour and sculpture. Mr. Nuttall believes that he found another species without scales. (*Carpenter*.)

I refer this shell to the present genus, because I believe it is specifically identical with the following variety.

Var. α. PENNATA.

T. solitaria, tenuis, laqueatim torta, aperturam versus ampliata; anfr. inferne inæquales, planiusculi; liræ longitudinales compressiusculæ, noduloso-serratæ, alternatim minores, interstitiis interdum lirula parva intercalante; liræ incrementi sæpe castanei vel badii, conferte anguloso-undatæ, pulcherrimæ, præsertim si versus lucem teneas, in intersectionibus lirarum incrassatæ, unguiculatæ, squamiferæ; apertura orbicularis. Color inferne albus, fascia violaceo-fusca, superne flavescens; lineæ hic illic badiæ vel nigræ strigisque transversis flexis; anfr. primi castanei; faucibus albis, macula badia inferne juxta aperturam.

Diam. aperturæ 10 m.

Vermetus margaritarum, Voy. de la Vénus, pl. 11. f. 2 (fig. minor); Chenu, Ill. pl. 4. f. 2 (copy).

Hab. California (*Mus. Cuming*).

This shell differs chiefly from *T. decussatus*, Gm., which is its West Indian analogue, in the larger calibre of the whorls. The striæ of growth are bent in a beautiful manner, giving the liræ a pennate appearance, which is best seen when the shell is held against the light. Although Carpenter does not mention the transverse black lines, yet I suppose that this shell is the young of *Aletes squamigerus*, because Carpenter (Cat. p. 303) states that the *Aletes centiquadrus*, var. *imbricatus*, has some characters in common with the young of the great Californian Vermetid *Aletes squamigerus*. The figures quoted are exceedingly like the variety, but the whorls are somewhat too narrow.

17. THYLACODES MICHAUDII, Rousseau.

Vermetus michaudii, Rouss., Chenu, Ill. pl. 2. f. 5.*Hab.* —? (*Mus. Cuming*).

Diam. circ. 6 m.

In Mr. Cuming's collection is a specimen labelled "Philippines," which seems to correspond pretty well with the figure quoted; it has the same annular ribs and longitudinal striæ, but is nearly covered over with a chestnut-brown colour, showing some darker longitudinal bands. The specimen is singular from possessing a long *varix maniciformis*, with about 12–13 false septa (analogous to those of the water-clam), proving that the animal has changed the direction of its tube at least as often as indicated by the septa.

18. THYLACODES PORITES, Rousseau.

T. tenuis, repens, teres, longitudinaliter subtilissime striata; striæ incrementi obsoletissimæ, confertissimæ; sulci incrementi regulariter remoti, interstitiis convexiusculis; faucibus sæpe flavescens.

Diam. $3\frac{1}{2}$ –4 m.*Vermetus porites*, Rouss., Chenu, Ill. pl. 2. f. 3.

Hab. —? On a *Porites*, according to the specific name; but I believe the coral represented is a *Palmipora*, Blainv., as in my specimen.

This species is exceedingly like *T. decussatus*, var. *intermedia*, if it really be different. It is chiefly distinguished by the annular, equidistant, rather remote annular sulci, the interstices of which are very slightly convex and decussate. This shell is the only one I know which seems to approach to Gualtieri's tab. 10. f. L, L.

19. THYLACODES PROTENSUS, Gm.

T. nitida, læviuscula, annulatim plicata, finem versus parum attenuata, lactea, exalbida aut cærulescens, calami anserini crassitie aut tenuiore, tota porrecta, aut partim flexuosa (Gm.).

Tubulus cylindricus, subflexuosus, anguinus, Mart. i. pp. 24, 46, f. 12A.

Serpula protensa, Gm. S. N. p. 3744. no. 20.*Hab.* In mari Indico et Americam alluente (Gm.).

Gmelin has taken his description from Martius, but the locality from Rumphius and Davila. This shell is perhaps identical with the preceding and following species. It is chiefly from the expressions "*T. nitida*" et "*cærulescens*," that I refer this species to the *Vermetidæ*.

20. THYLACODES RUMPHII, Blainv., 1828.

"Coq. tubulaire, irrégulièrement contournée, si ce n'est à sa base qui s'avance presque à droite ligne, élégamment treillissée dans tout son étendu sans carène; de couleur roussâtre. Je distingue cette espèce d'après un individu de ma collection, dont j'ignore la patrie, et qui certainement ne peut être réuni au *S. protensa*, Lam."—*Blainv.*

Een entgestrekte Hornschlange, Rumph, t. xli. p. 126. no. 3.

Tubulus vermium, Petiv. Gazophyl. Amb. t. 21. f. 18 (copy).

Le tuyaux cordé, Favanne, i. p. 676, t. 5. f. F (copy).

Serpula protensa, Dill. ii. p. 1085. no. 38 (non Gm., nec Wood, f. 37).

Hab. — ?

As the shell of Rumphius is marked with a number, it need not be from Amboina. The description of Favanne has much in common with Blainville's, chiefly in respect of the colours and septa; it is perhaps even from the same specimen. It is possible that this species is identical with the two preceding.

The annular rings in Rumphius' figure, and the reddish colour mentioned by Favanne and Blainville, remind one of *T. michaudii*, var. from the Philippines.

21. THYLACODES? ORYZATA, Mörch.

T. libera, agglutinans, repens, alba vel pallide isabellina, hic illic lineis interruptis et punctis obsoletis rufis; anfr. primi parvi, angusti, candidi, oblique spiraliter torti, contigui, liris longitudinalibus et transversis æquidistantibus et subæqualibus decussatis, inde interstitiis foveis quadratis; anfr. cæteri continui, sigmoidei, aperturam versus rapide crescentes, liris obsoletis longitudinalibus leviter spiraliter tortis, tuberculis acutiusculis subremotis ornatis; interstitia lirulis planis confertis inæqualibus 5-6; striæ et rugæ incrementi parvæ, flexæ, in intersectionibus minutissime granuloso-squamosis; apertura circularis, faucibus regulariter scrobiculatis (ex tuberculis externis).

Diam. aperturæ 12 m.; long. testæ 300 m.

Hab. Litt. occid. Am. centralis verisimiliter; China (*Mus. Cuming*).

The first spiral whorls are attached to a valve of a *Balanus*; towards the aperture is agglutinated a worn portion of a *Venus*, which looks to be *V. subimbricatus* (Sow.), and a little bit of a *Cardium*, which perhaps is *C. senticosum* (Sow.), both species from Panama, which probably is the true locality, as it is of the variety. The sculpture of this remarkable shell is very like that of *Argonauta oryzata*, Meusch.; like the latter shell, the tubercles outside form excavations inside. This sculpture is, too, very like that of the young of *Stephopoma*. The longitudinal liræ become feebler towards the aperture, in proportion to the size of the shell. The nodules are often united in pairs by small transverse ridges, but never form rings, as in the

Var. a. ANNULATUS.

Tubus crassus, ponderosus, teres, æqualis, liris longitudinalibus parum expressis tuberculiferis, interstitiis liris circiter tribus, mediana lira validior; striæ incrementi minutissimæ undulatæ; tubercula annulatim digesta; annuli subvaricosi, utrinque arcuati, sæpe interrupti vel furcati.

Long. tubi circ. 170 m.; diam. aperturæ 13 m.; diam. testæ 17 m.; diam. aperturæ fractæ 10 m.; testæ postice 13 m.

Hab. Ad Panamam (*Mus. Cuming*).

This shell seems to be a very old specimen ; it has just the same sculpture, only differing in a few points ; the longitudinal liræ are straight and not slightly spiral ; the nodules are arranged in rings, separated from each other by constrictions. Both ends are fractured, so that it might have been possibly still larger. The walls have a thickness of 2 or 3 m., whilst the type is very thin, nearly pellucid. If this tube really is the same as the type, it must grow to a length of about 60 dm. I refer this species to the present genus, merely on account of the sculpture of the first whorls.

It is, in respect of thickness, most allied to *T. melitensis*, Gm.

Subg. TETRANEMIA, Mörch, 1859, Journ. f. Conch. viii. p. 353.

Filamenta pedalia longissima, subulata, non contractilia, mammilla valida intermedia ; mesopodium parvum, elongatum, postice filamentis brevissimis obtusis duobus basi remotis (ex icone).

22. THYLACODES (TETRANEMIA) LONGIFILIS, Mörch.

T. repens, laqueatim contorta, fusco et flavo variegata, longitudinaliter lirulata, liris 3-4 validis remotis ; apertura transversim subovalis, intus cyanea (ex icone).

Vermetus dentiferus, "Lam." Q. & G. l'Astr. p. 291, t. 67. 27, 28.

Vermetus dentiferus, Desh. ix. p. 65, non Lam.

Serpuloïdes dentifera, Gray, Fig. t. 56. f. 8, iv. p. 83 ; Gray, Guide, p. 127.

Serpulorbis dentifera, Adams, Genera, i. p. 359.

Serpulorbis dentiferus, Chenu, Man. p. 320, f. 2307 ; Pictorial Museum, f. 2821 ; Ill. Ntg. f. 3745.

Hab. Bai des Chiens Marins à la terre d'Endracht, sur une *Avicula* (Q. & G.).

Subg. HATINA, Gray, Proc. Zool. Soc. 1847, p. 156.

Animal rostro conico, tentaculis crassis flexis postice in figuram cordiformem desinentibus ; metapodium magnum, cylindricum, truncatum ; filamenta pedalia desunt ; penis subulatus (ex icone).

Hatina, Gray, Brit. Mus. Cat. 1842, p. 62, no operculum.

23. THYLACODES (HATINA) INOPERTUS, Mus. Francof. 1828.

T. satis crassa, postice spiris nonnullis majoribus finiente, colore æruginoso.

Mensura : usque ad 2" ; animal 1½" (*Leuck.*).

Vermetus inopertus, Rüppel & Leuckart, Neue wirbellose Thiere, p. 38, t. 11. f. 3 (Gray, Fig. i. t. 57. f. 1, copy).

Serpulorbis operculatus, Gray, Proc. Zool. Soc. 1847, p. 156.

Serpuloïdes inoperculata, Gray, Fig. iv. p. 83; Gray, Guide, p. 127.

Serpulorbis inoperculata, Adams, Genera, i. p. 359.

Hab. In mari Rubro, socialiter vivens prope vicum *Tor* lapidibus affixus, reperitur (*Rüppel*).

If this species can be generically distinguished, it would chiefly be on account of the heart-shaped shield over the head, like that of *Siphonium maximum*, represented by Quoy and Gaimard. It wants the pedal filaments, in common with *Cladopoda* and *Limintina*; from the former it is distinguished by the circular tip of the metapodium, and from the latter by wanting the radiation of the foot.

Subg. LEMINTINA, Risso, 1826.

Lementina, Risso, Hist. iv. p. 433; Gray, Proc. Zool. Soc. 1847, p. 156, et Fig. iv. p. 83, 1850.

Dr. Gray (Guide, p. 127) regards this genus as "probably only a badly described and figured *Serpuloïdes arenarius*;" but the shape of the metapodium seems so remarkable to me that I cannot believe that it is invented. The *Vermetidæ* have been so neglected that it is not impossible that a similar form may exist.

24. THYLACODES (LEMINTINA) CUVIERI, Risso.

T. cylindrica, subspiralis, unilocularis, ad extremitatem posteriorem clausa; apertura rotunda (Risso).

Animal limaciforme, postice vermiforme; *tentaculis* subulatis; *oculi* subsessiles, nigri; *branchiæ* albæ super capite locatæ; *pes* cylindricus, truncatus, superficie lævi rubra, flavescente radiata, pallio fimbriato ruberrimo (Risso).

Lemintina cuvieri, Risso, Hist. iv. p. 114, t. 2. f. 16-18; Gray, Fig. t. 57. f. 3, p. 83.

Hab. Sur les rochers peu profonds (*Risso*).

The figure of the shell does not show any longitudinal striæ; the description seems more natural than the figure, which is chiefly remarkable from the radiated metapodium dentated at the edge.

Subg. CLADOPODA, Gray, 1850.

Operculum none; foot elongate, front end simple, hinder extremity oblong, clavate or subtruncate (*Gray*).

Cladopoda, Gray, Fig. 1850, p. 83; Guide, p. 127.

This genus is chiefly founded on the elongated shape of the hinder part of "the foot," which, in the 'Voyage de l'Astrolabe,' is represented as fiddle-shaped (*pes panduriformis*), like the foot of *Lacuna*; but, from analogy with the other *Vermetidæ*, it must be the tip of the metapodium unusually enlarged. In specimens in spirits of *T. polyphragma* the metapodium is sometimes of an expanded shape; I suppose therefore that this character is not of generic value. The

pedal filaments seem to be rudimentary, as I suppose they are described by Quoy and Gaimard thus:—"En avant de la bouche, sont deux petits tubercules assez courts." The eyes in the *typical* species are represented, differently from those of all other *Vermetidæ*, at the middle of the tentacula. The annular figure is also peculiar.

25. THYLACODES (CLADOPODA) GRANDIS, Gray, 1842.

"Notre individu, de seize lignes de diamètre, bien discoïde, ce qui n'existe pas toujours, est aplati en dessous, arrondi en dessus, rugueux, strié dans la longueur, avec deux ou trois côtes tuberculeuses. Sa couleur est jaunâtre sale. Son ouverture, parfaitement ronde, est lisse et violacée en dedans."—Q. & G.

"L'animal a un écusson céphalique, long et ovalaire, les tentacules courts, portant les yeux à une certaine distance de leur base. En avant de la bouche, sont deux petits tubercules assez courts. Le pied, qui manque d'opercule, présentait la particularité suivante: il se relevait au devant de la tête en forme de crosse. Le pied a des taches blanches en avant. Le manteau, qui est blanc, a son bord brun. Plusieurs individus avaient la tête blanchâtre, quelques uns avaient le manteau jaune. Un seul avait la tête entièrement noire, et un autre rougeâtre."—Q. & G.

V. (à grand tube) *arenarius*, Lam., Q. & G. l'Astrolabe, 1833, ii. p. 289, t. 67. f. 18-20.

Vermetus grandis, Gray, Fig. i. p. 29.

Cladopoda grandis, Gray, Fig. iv. p. 83, t. 56. f. 9.

Cladopoda arenaria, Q. & G., Adams, Genera, p. 359, t. 39. f. 3.

Cladopoda grandis, Q. & G., Adams, Genera, p. 359.

T. juv.? *Cladopoda arenaria*, Chenu, Man. p. 320, f. 2302 (shell).

Hab. Le port du Roi-Georges, par d'assez grandes profondeurs, sur d'autres coquilles (Q. & G.).

The shell figured by Dr. Chenu is very different, chiefly in size, from that represented in 'l'Astrolabe;' but is very like to a shell creeping on *Cookia inæqualis*, Martyn, from New Zealand, in the Royal Museum, probably obtained by Humphrey.

In Mr. Cuming's collection is a rather larger specimen of a shell, without locality, marked 1/6, probably from some old collection, which I provisionally refer to this species on account of the colour and its resemblance to *V. arenarius*, Q. & G. It reminds one too of *T. longifilis*, but it is twice as large as any of the specimens represented.

Var. a. OXYGONA.

T. primum laqueatim deinde annulatim torta, dura; anfr. ampliati, rapide crescentes, superne flavo et cinereo variegati, liris remotis circiter 6-8 umbilicum versus (2-3) fortioribus, nodulis obsoletis subasperis remotis; interstitia lirulis planis confertissimis 5-8; striæ incrementi confertæ, minutæ, in intersectionibus arcuatæ, interstitiis scrobiculato-punctatis; latere affixo tenui, lævigato, cinereo striato, externo destituto planiusculo;

peripheria acutissima, leviter expansa; apertura affixa, in anfr. penultimo reniformi-ovalis, intus albescens, margine interno incrassato; anfr. primi intus castanei, desepimentis tenuibus convexis.

Latitudo aperturæ 16–18 m.; altitudo aperturæ circ. 14 m.; lat. anfr. lateris affixi circ. 20 m.

The specimen shows traces of a soft yellowish stone, on which it has been affixed. On some places are traces of small reddish spots. It is very like *T. colubrinus* in size and sculpture.

26. THYLACODES (CLADOPODA) ELEGANS, Q. & G. 1833.

Animal corpore cinereo; tentaculis, capite et pede rubro maculatis.

Testa ignota (Q. & G.).

L'animal a la tête courte, jaune, ponctuée de rouge vif; deux lignes de cette couleur, en chevron brisé, occupent l'intervalle des yeux. La partie antérieure de la tête et le pied sont d'un joli gris clair; ce dernière est bordé et ponctué de rouge; les tentacules ont une ligne en long de cette couleur. Le bord du manteau et de la bouche sont également rouges.

Vermetus elegans, Q. & G. l'Ast. ii. p. 293, t. 67. f. 11, 12.

Cladopoda elegans, Gray, Fig. iv. p. 83, t. 56. f. 4; Adams, Genera, i. p. 359.

Hab. —? The locality is not indicated.

This species differs chiefly from the preceding in the regular position of the eyes.

27. THYLACODES (CLADOPODA) ZELANDICUS, Q. & G.

Animal capite nigricante, rubro punctulato; limbo pallii aurantiaco; pede rubro punctato.

“La tête est jaunâtre en arrière, brune et ponctuée de rouge en avant. Le pied est seulement jaunâtre, avec des taches rouges; le manteau est largement bordé d'un orange vif.

“Le tube, contourné sur lui-même, ne nous a point offert de caractères appréciables sur le moment.”—Q. & G.

Vermetus zelandicus, Q. & G. l'Astr. p. 293, t. 67. f. 16, 17.

Vermetus novæ zelandiæ, Gray, Fig. i. p. 28, t. 56. f. 6.

Cladopoda novæ zelandiæ, Gray, Fig. iv.; Guide, p. 127.

Cladopoda novæ zelandiæ, Q. & G., Adams, Gen. i. p. 360.

Hab. La baie des Iles, à la Nouvelle Zélande (Q. & G.).

It is only with doubt that the authors of this species have distinguished it from the preceding.

Additions and Corrections.

BURTINELLA TURBINATA (SERPULA), Phil. (P. Z. S. 1861, p. 148.)

According to specimens in Mr. Semper's collection, this species is entirely different from *B. nystii*, Galeotti, and nearly allied to *Hy-*

droïdes norvegica, Günth.,—the variety described by Montagu as *Serpula reversa*, Mont.=*S. contorta*, Brown, Ill. t. 2. f. 4.=*Heterodisca reversa*, Flem. It is a true Serpulidous shell.

3 a. STEPHOPOMA, n. sp. (See P. Z. S. 1861, p. 148.)

In the collection of Charles VIII. is preserved a lid distinctly spiral, of a brown colour, convex inside, and provided outside with long bristles, very like those of *Stephopoma senticosum*, Mörch (Proc. Zool. Soc. 1861, pl. 25. f. 2), but having all the lateral spines simple, without any accessorial spines. It is mounted on mica, and labelled by the late Rev. Mr. Lyngby as the lid of a *Serpula* found on the egg-case of *Raia batis* (in Danish "Tærbe"). That it really was found in the Kattegat, near Gilleleie, which was his parish, is probable from the circumstance that he has added the *Danish specific* name to a fish of which several congeneric species are described in his MS. "Rariora Codana" with Danish specific names. Unfortunately I cannot find his diary, in which it is more particularly described according to the ticket. The study of the Worm-tubes is so neglected that I do not regard it impossible that a Vermetid may be found in the Northern Seas. Perhaps it may prove to be the *Spirorbis striatulus*, Brown (Ill. pl. 1. f. 59), which is from Dunbar, in Gen. Bingham's collection.

3 b. STEPHOPOMA ARCHIMEDIS, König. 1842-44.

T. subcompressa, spirata; anfractibus quinque, ultimo remoto; superficie plicato-rugosa; orificio ovali.

Serpula archimedis, König, Carb. p. 57, t. 9. f. 6.

Serp. spinosa, Kön. Carb. p. 58, t. 9. f. 8 (T. juvenilis).

T. depressa, planorbiformi, anfractibus quatuor, contiguïs, sensim incrassatis, spinis in quincunces dispositis, obductis (De König).

Hab. Fossil in the Mountain Limestone, at Vise (König).

The supposed young shell is from the clay of Tournay. The form of the aperture and the flexure of the striæ of growth are quite that of *Stephopoma*. The sculpture of the supposed young shell can only be compared with the embryonic shell of *Stephopoma senticosum*, Mörch (Proc. 1861, pl. 25. f. 14), which circumstance has guided me in giving it the present place.

It is probable, from the appearance of a group of *Vermeti* on a *Chama* (in the Museum Regium), that *Siphonium textum*, M., *S. scaphitella*, M., and *S. pictum*, M., are different ages of *S. subcrenatum*, Lam., corresponding to the different forms of *Siph. nebulosum*, Dillw.

Erratum, P. Z. S. 1861, p. 180, line 6 from bottom, for *squamas confertas fornicatas amplexentibus*, read *squamis confertis fornicatis amplexentibus*.



Mørch, Otto Andreas Lowson. 1862. "7. Review of the Vermetidae."

Proceedings of the Zoological Society of London 1862, 54–83.

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