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THE ANNALS

AND

MAGAZINE OF NATURAL HISTORY.

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XVIII.—*Some Observations on the Genus Serpula, with an Enumeration of the Species observed with the Animal in the Mediterranean.* By Dr. A. PHILIPPI*.

[With a Plate.]

FEW animals have been so much neglected by naturalists as the *Serpula*, frequent proofs of which assertion will occur in the course of these observations; it is on this account that I consider it advantageous to lay before the zoological public the results of my observations made on twenty-five species relative to the external structure of the animal; I shall reserve for a separate work more detailed descriptions, which will be accompanied by drawings.

Linnaeus, in the 12th edition of his 'Systema Naturæ,' p. 1264, characterizes the genus *Serpula* thus: "*Animal Terebella. Testa univalvis, tubulosa, adhærens (sæpe isthmis integris intercepta).*" By the words "*animal Terebella*," Linnaeus, although he has admitted several species of *Vermetus* among *Serpula* from his being unacquainted with the animals, has nevertheless excluded Adanson's *Vermetus*. The words "*sæpe isthmis integris intercepta*" refer solely to the shell of *Vermetus*, and must therefore be excluded from the diagnosis. Lamarck likewise adopts this false characteristic; but Blainville has correctly stated in the 'Dict. des Sciences Naturelles,' vol. xlviii. p. 550, that it is precisely in the absence of septa that the shell of *Serpula* differs from that of *Vermetus*. My former supposition, that the shell of *Vermetus* possessed exclusively a porcellaneous nature, while that of the species of *Serpula* was calcareous, I must now retract, having become acquainted with true *Serpula* with a vitreous shell.

The true *Serpula* have been divided by modern zoologists into the following genera: *Serpula*, Lamk.; *Vermilia*, Lamk.; *Galeolaria*, Lamk.; *Cymospira*, Savigny, Blainville; *Spirorbis*, Lamk.; *Filograna*, Berkeley; *Protula*, Risso; *Spiromella*, Savigny, Blain-

* From Wiegmann's Archiv, Part 2. 1844. Translated by W. Francis, Ph.D.

ville. The characters on which these separations are founded are of different value. *Vermilia* and *Galeolaria* differ from *Serpula* solely by the structure of the operculum; according to Lamarck, *Serpula* possesses an 'operculum pedicellatum infundibuliforme aut clavatum (*corneum*)'; for some lines further he says, "cette opercule, par conséquent, n'est point calcaire." (2nd ed. An. sans vertèbres, v. p. 361.) *Vermilia*, on the contrary, has an 'operculum testaceum orbiculatum, simplex'; and further on, 'à dos convexe, le plus souvent conique.' (Ibid. p. 368.) *Galeolaria*, lastly, is said to possess an 'operculum testaceum compositum,' which, according to my observations however, does not consist of five to nine but of fifteen pieces; the number however may differ in the various species; at all events, the drawing in the 'Dict. des Sciences Naturelles' is decidedly bad. *Filograna*, Berkeley, is said to possess constantly two opercula, which has likewise been observed exceptionally in other species. *Protula*, Risso, and *Spiromella*, Blainv., have no operculum: Cuvier refers them curiously enough to *Sabella*.

The genera *Cymospira* and *Spirorbis* have been established according to the number of filaments into which the branchiæ are divided and according to their arrangement. In *Cymospira* the branchiæ are on each side divided into numerous filaments and rolled upspirally; in *Spirorbis* they consist only of three filaments; but these characters are of very slight value. The different species of *Serpula* which I have observed with the animal have 3, 4, 6, 7, 8, 10, 11, 13, 18, 30, 40, and more filaments to each branchia, and the larger their number the more requisite is it for them to adopt a spiral arrangement. I have likewise found in *Vermilia triquetra* and *Pomatoceros tricuspis* (see below), that the filaments of the branchiæ describe a spiral of one convolution of the kind represented ☞ when they are expanded. It appears therefore to me that no very accurate limits exist between spiral and non-spiral branchiæ. According to Blainville, the branchial filaments of the *Vermilæ* have cirrhi only on one side, which I look upon as an error.

The mode of growth has likewise been taken into consideration, and those species with a spiral growth have been referred to *Spirorbis*; yet the likewise remarkably spirally wound *S. cereolus*, the animal of which is still unknown, is excluded. One of the principal results of my observations is, that no relation exists between the nature of the animal and the shell, except perhaps in the genus *Galeolaria*; this indeed is a sad result: thus, for instance, we have a *three-ridged* shell in three different sections, an *orbicular* shell in still more; in one division there are smooth orbicular, orbicular with longitudinal bands, triangular, quadrangular, &c.

From what has been stated above, the structure of the operculum is the best character upon which to form the subdivisions

of *Serpula*; this character has moreover the advantage that it may still be frequently observed in dried specimens preserved in museums. The structure however of the operculum is far more varied than hitherto supposed, and several new subdivisions must be made, of which the following are the characters:—

A. Animal with opercula. On each side of the neck a *short* membrane, *broad above* and *narrow beneath*, bearing seven fasciculi of bristles, the upper one being generally directed anteriorly (this structure is not known of *Galeolaria*). *Serpula*, Cuv.

a. Operculum *horny*, shallow or infundibuliform, *curved at the margin*, radiately striped above; supported on a subconical fleshy petiole. *Serpula* in the restricted sense.

b. Operculum *calcareous*, *forming a shallow disc*, *margin entire*. *Placostegus*, Ph. This operculum calls most to mind that of a gasteropod.

c. Operculum *calcareous*, *conical*, shortened or elongated, without appendage. *Vermilia*, Lamarck.

d. Operculum *calcareous*, *hemispherical*, with appendages (which are interiorly hollow). *Pomatoceros*, Ph.

e. Operculum *calcareous*? *horny*? consisting of an elliptical shallow plate which supports on the hinder portion two ramified horns, but on the anterior margin uncinat bristles; the branchiæ are rolled up spirally. *Cymospira*, Savigny, Blainv. The *Serpula gigantea*, Gm., which forms this division, I am not acquainted with from the original essays of Pallas and Home, but only from Blainville's 'Dict.' and from the copy of Home's figure given by Blumenbach (Abbildungen Naturhist. Gegenstände, no. 67).

f. Operculum *horny*, almost as in *a*, but provided on the upper side in the centre with moveable points, which (at least in one species) are likewise horny. *Eupomatus*, Ph.

g. Operculum *calcareous*? obliquely truncated?; shell small, always spirally wound?; branchiæ constantly? composed of few filaments. *Spirorbis*, Lamk. [The form of the operculum exhibited by the figure in the 'Dict. des Sciences Nat.' 1. fig. 2. is, precisely as in *Placostegus*, different from the form which I have observed in another species.]

h. Operculum *calcareous*, composed of very many pieces. *Galeolaria*, Lamk.

B. No operculum. The lateral membrane continued for half the length of the body, equally broad. *Apomatus*, Ph.

a. Branchiæ spiral. *Protula*, Risso; *Spiromella*, Blainv.

'Dict.' xlviii. p. 560*. [The description which Risso gives in his 'Hist. de l'Eur. Mérid.' iv. p. 405. is quite romantic, and does not in the least agree with the statements of Cuvier in 'Règne Animal,' ed. 2. vol. iii. p. 192, whose description is exactly in accordance with my own observations, which will be detailed under *b*.]

b. The branchiæ simply fan-shaped. *Psygmobranchus*, Ph.

I cannot agree with Cuvier in referring the last section, to which I have applied the name *Apomatus*, to *Sabella*. I would not lay any great stress on the fact that the *Sabellæ* form a membranous or coriaceous tube, while *Apomatus* forms a calcareous one; but I consider of great importance the fact, that in the *Sabellæ* all the rings of the body are formed alike and are provided with similar bundles of bristles, while in *Apomatus*, precisely as in *Serpula*, the first seven fasciculi of bristles are fixed in a membranous expansion, of which not a trace was indicated in the *Sabellæ* observed by me.

I will now pass on to the characters of the individual species.

1. SERPULA, *L. (sensu strictiori)*.

1. *S. echinata*, Gm., *testa* teretiuscula, protensa, flexuosa, rosea, transversim rugosa, carinis denticulatis, echinata. Diam. 2^{'''}.
Animal branchiis albo coccineoque fasciatis, florum (in utraque) 30 et ultra, operculo rubro. Gm. p. 3744; Gualt. t. 10 R.; Martini, l. f. 8.

2. *S. pallida*, Ph., *testa* teretiuscula, protensa, flexuosa, pallide rosea, carina mediana conspicua, laterali utrinque obsoleta, striisque incrementi tenuibus subaspera. Diam. 1½^{'''}.
Animal branchiis albo coccineoque fasciatis, florum pauciorum quam in antecedente, operculo albedo.

3. *S. triquetra*, L. ?? *testa* triquetra, flexuosa, alba, altero, latere tota adnata. Diam. 2^{'''}.
Animal branchiis albo coccineoque fasciatis, florum circa 30; operculo coccineo, crenis circa 24 (according to the drawing; I forgot to notice the number of folds).

I do not however think that is the Linnæan species. Linnæus has not described the animal, and only saw small individuals; the subsequent citations of Baster, copied by Martini, Gualtieri and others, do not exactly correspond to my species, as they represent the shell much thinner. It should also be observed, that the shells of *Serpula triquetra*, *Vermilia triquetra*, and *Pomatoceros tricuspis* are difficult to distinguish without the animals. Would it therefore not be better to banish entirely the name *Serpula triquetra* of Linnæus?

* The figure of Seba (i. t. 29. fig. 1, 2) does not agree, as already observed by Cuvier, with the diagnosis; it wants the disque of Cuvier or the thorax, "égalant au moins la moitié de l'abdomen."

4. *S. vermicularis*, L. ? *testa* tereti, flexuosa, læviuscula, apice libero protensa, rosea; ore patulo; carina denticulata dorsali demum obsoleta. Diam. $2\frac{1}{2}$ '''.

Animal branchiis omnino coccineis, filorum multorum; operculo coccineo, crenis plurimis. (Fig. A. Plate III.)

This species shows with how little judgement the *Serpulae* have been investigated. Blainville, 'Dict.' l. c. p. 553, assigns to each branchia seven to eight digitations, while in the drawing we find on each side twenty-six! In the description he terms the operculum clavate with two minute horns; but this is the case, according to pl. 1. fig. 3, with the operculum of *Vermilia triquetra*; and the figure of *Serpula vermicularis*, pl. 1. fig. 1, exhibits a totally different form of operculum, being according to the definition I have given above, that of a true *Serpula*. Is it possible to commit greater contradictions? Thus then, according to Blainville's description of the operculum, the animal is not a *Serpula* but must be a *Vermilia*, Lamarck, which genus Blainville adopts. Cuvier likewise states in the 'Regne Animal,' ed. 2. iii. p. 191, (according to Müll. Z. D.,) that the operculum has two or three small points, in which his species and Müller's would be a *Pomatoceros*.

[It is possible that nos. 1, 2 and 4 should be considered as mere varieties of one species.]

5. *S. aspera*, Ph., *testa* teretiuscula costis circa 7, crenulatis ornata, alba. Diam. 1'''.

Animal branchiis fusciscentibus aut rubentibus, filorum 8 utrinque; operculo albido, crenis 16—24. (Fig. B.)

An *Vermilia scabra*, Lam. ? The figure in Delessert's 'Recueil,' &c. is thoroughly bad, and the text in this work is, as is well known, of no assistance whatever.

6. *S. subquadrangula*, Ph., *testa* elongata, subquadrangula, angulis crenato-dentatis, carinis tribus, singulis in medio laterum liberorum. Diam. $\frac{3}{4}$ '''.

Animal albidum, branchiis filorum 8 utrinque; operculo basi aucto, fusciscente, crenis admodum profundis, circa 24. (Fig. C.)

The fleshy petiole is not simply conically thickened at the extremity, but first cylindrically and then obconically.

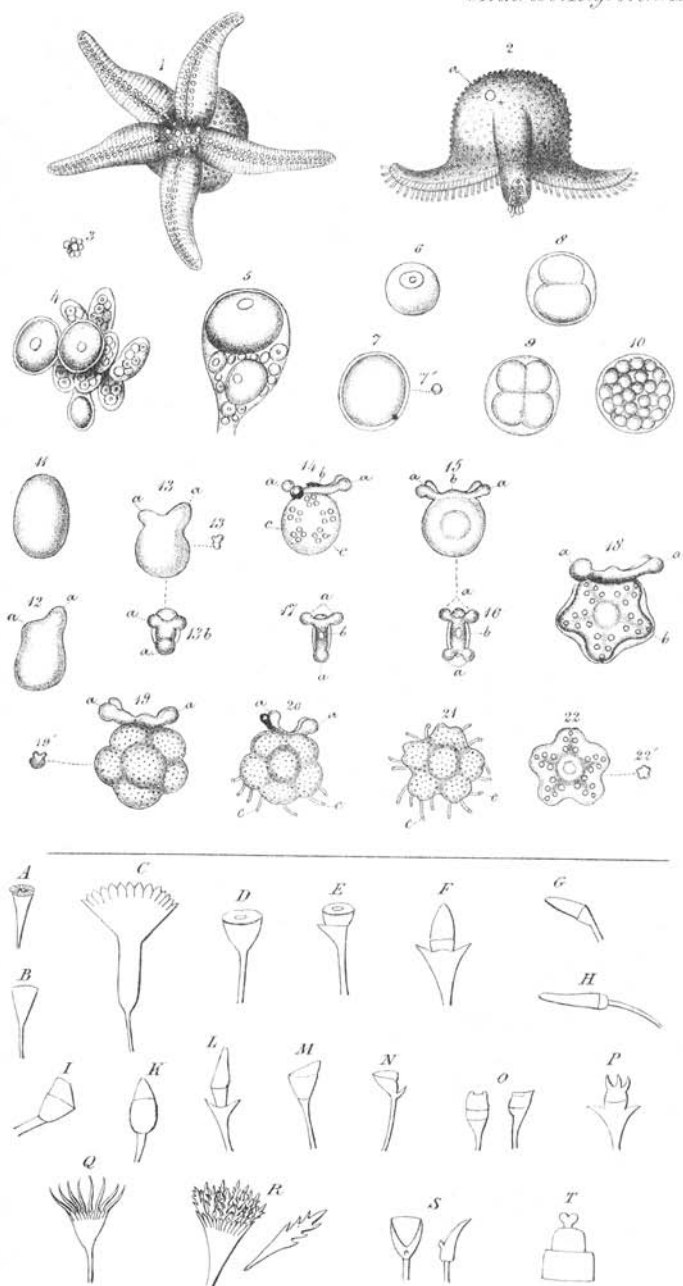
7. *S. venusta*, Ph., *testa* tereti, transversim striata, varicibus pluribus ornata; alba, ore patulo. Diam. 3'''.

Animal coccineum; branchiis filorum frequentium; operculi crenis circa 60.

The largest species which I have observed and preserved in spirits. The animal is 28''' in length, and 3''' in thickness.

2. PLACOSTEGUS, Ph.

1. *Pl. crystallinus*, Scac., *testa* vitrea, triquetra, demum libera, et



carinis omnibus excurrentibus tricuspidata; carina dorsali serrata. Diam. $1\frac{1}{4}'''$.

Animal album; fasciis duabus fuscis in branchiis; filis circa 9 in utraque; pedunculo operculi simplici. (Fig. D.)

Serpula crystallina, Scac. Catalogo, p. 18.

Lives in great depths upon corals.

2. *Pl. fimbriatus*, Delle Chiaje, *testa* teretiuscula, seriebus 4—7 longitudinalibus appendicum falcatarum, pectinatarum, confertissimarum ornata. Diam. $1-1\frac{1}{2}'''$.

Animal album; branchiarum coccinearum filis utrinque circa 9; pedunculo operculi appendice aucto. (Fig. E.)

Serpula fimbriata, D. Ch. Memorie, iii. p. 226. t. 48. f. 19, 20, *testa* (animal cl. auctori non innotuit).

3. VERMILIA, Lamk.

1. *V. triquetra*, Lamk., *testa* triquetra, flexuosa, alba, altero latere adnata. Diam. $1'''$.

Animal branchiarum albarum, fusco-articulatarum filis numerosis? (saltem ultra 7); operculo elongato, subcylindrico, obtuso; pedunculo utrinque filum gerente. (Fig. F.)

Vermilia triquetra, Lamk. nr. 2. "Son opercule est conique."

Rare. See the previous observation respecting Linnæus's *Serpula triquetra*.

2. *V. infundibulum*, Gm., *testa* tereti, alba, multoties varicosa, quas ex infundibulis sese recipientibus conflata; ore quam maxime patulo. Diam. (oris) $4\frac{1}{2}'''$.

Animal branchiarum albo coccineoque fasciatarum filis multis; operculo elongato-conico. (Fig. G.)

Serpula infundibulum, Gm. p. 3745; Lamk. nr. 9. excl. var.; Delesert, Recueil, 1. fig. 8. ad specimen malum.

3. *V. clavigera*, Ph., *testa* tereti, lineis longitudinalibus elevatis quinque ornata. Diam. $\frac{3}{4}'''$.

Animal . . . operculo valde elongato, subcylindrico. (Fig. H.)

The dry animal did not exhibit the branchiæ distinctly on being softened.

4. *V. calyptrata*, Ph., *testa* tereti, crassa, transversim corrugata. Diam. $1\frac{1}{2}'''$.

Animal fuscescens, collari lineaque in filis branchiarum viridibus, filis branchiarum 11; cillis rufo-fuscis; operculo conum obliquum truncatum referente. (Fig. J.)

5. *V. multicristata*, Ph., *testa* tereti, lamellis 5, longitudinalibus, plerumque pectinatim incisus cristata. Diam. $\frac{3}{4}'''$.

Animal albidum; operculo parvo, conico, basi carnosæ, multo crasiori, subglobosæ insidente. (Fig. K.)

I likewise possessed only a dried specimen of this species, the branchiæ of which could not be disentangled.

6. *V. elongata*, Ph., *testa* obscure quadrangula, crassa, transversim rugosa, linea impressa dorsali. Diam. $\frac{3}{4}'''$.

Animal rubrum; branchiarum utrinque filis 6—8; operculo elongato-conico; pedunculo utrinque filum gerente [ut in *V. triquetra*]. (Fig. L.)

7. *V. quinquelineata*, Ph., *testa* tereti, lineis elevatis, longitudinalibus, lævibus, quinque ornata [ut in *V. clavigera*]. Diam. $\frac{1}{2}'''$ — $\frac{2}{3}'''$.

Animal branchiarum lutescentium filis utrinque 8, rubro maculatis; operculo conum brevem obliquum referente [fere ut in *S. calyptrata*]. (Fig. M.)

8. *V. polytrema*, Ph., *testa* triquetra adnata; carinis foris frequentibus perforatis. Diam. $1\frac{1}{2}'''$.

Animal coccineum, branchiarum filis utrinque c. 6; operculo forma conici obliqui brevissimi; pedunculo albido annulis tribus fuscis ornato et utrinque filum gerente [ut in nr. 1 et 6]. (Fig. N.)

In *Vermilia triquetra* and other triangular *Serpulae*, the keels consist when broken through of a series of cells; in this species only the septa as it were of the cells are developed, and the three keels perforated by the rows of their apertures are highly elegant in appearance. The diameter of the tubes is very small, from the lateral adherent margins occupying the greater portion of the diameter.

9. *V. emarginata*, Ph., *testa* tereti, alba, carinis 3—4 sæpe in dentes antrorsum directos, dorso incisos elevatis. Diam. $1'''$.

Animal filis branchiarum utrinque 6—7; operculo formam conici obliqui truncati referente; pagina superiore marginata, antice emarginata, obscure bidentata. (Fig. O.)

I examined a softened specimen of the animal in Cassel.

4. POMATOCEROS, Ph.

1. *P. tricuspis*, Ph., *testa* triquetra, sæpe in gyrum contorta, alba. Diam. $2'''$.

Animal branchiis albo et coccineo, sive albo et fusco fasciatis; filis ultra 18; operculo hemisphærico, vertice cornubus tribus acutis instructo; pedunculo utrinque filum gerente. (Fig. P.)

Very common. This appears to be the *Serpula triquetra*, Fr. Hoffmann, 'Verhandl. Berl. Gesells.' vol. iii. p. 150. It may probably likewise be *S. triquetroides* (!), Delle Chiaje, Mem. iv. t. 67. f. 15. without description. Does *S. vermicularis*, Cuv., 'Règne Anim.' ed. 2. iii. p. 191, likewise belong here? "son opercule en massue est armée de deux ou trois petites pointes."

Vermilia triquetra, 'Dict. des Sc. Nat.' pl. 1. fig. 3, appears to form a second species, the operculum of which, supposing the figure to be correct, consists of two appendages and supports a forked appendage, the two ends of the fork being obtuse.

5. CYMOSPIRA, Savigny.

No species belonging to this genus occurs, as far as I am aware, in the Mediterranean.

6. *EUPOMATUS*, *Ph.*

1. *E. uncinatus*, *Ph.*, *testa* tereti, transversim rugosa. Diam. 1^{mm}.
Animal fuscescens; branchiarum albarum, fusco-fasciatarum filis utrinque 13; margine operculi inciso-dentato; cornubus octo; apice incurvo uncinatis. (Fig. Q.)

Not rare. Delle Chiaje, 'Memorie,' vol. iii. t. 48. fig. 21, figures a perfectly similar animal *with two opercula*, but calls it *Sabella euplaeana*, and asserts that its shell consists of grains of sand!!

2. *E. pectinatus*, *Ph.*, *testa* tereti, transversim rugosa, lineisque longitudinalibus obsoletis. Diam. $\frac{3}{4}$ ^{mm}.
Animal fulvum; branchiarum filis utrinque decem, punctis coccineis ornatis; operculi margine crenato; cornubus duodecim, rectis, utrinque pectinatis, dentibus tribus acutis. (Fig. R.)

A specimen which I examined possessed *two* perfectly similar opercula.

7. *SPIRORBIS*, *Lamk.*

1. *Sp. Cornu Arietis*, *Ph.*, *testa* spirali, tereti, concentrice striata; anfractu ultimo reliquos abscondente. Diam. totus gyri 4^{mm}.
Animal pallide aurantiacum, branchiarum albarum filis utrinque *quatuor*; operculo obliquo, subspathulato, in parte postica appendice brevi aucto. (Fig. S.)

The operculum is placed obliquely on the petiole as in *Cymospira*; the inferior or hinder margin is thicker, and supports a short, weak, bifid appendage; the upper or anterior margin is thin and simple. *Spirorbis nautiloides*, *Lamk.*, is extremely common; I have not however had occasion to examine the animal.

8. *FILOGRANA*, *Berkeley.*

I have not been able to observe the animal of this section. According to the short notice, without any statement respecting the source, in *Lam.* 'Hist.' &c. ed. 2. v. p. 621, "le nombre des appendices tentaculaires est de huit, dont deux garnis d'un opercule infundibuliforme." Are there really *eight* tentacular appendages instead of two? That would be highly remarkable. Or are the other six *appendices tentaculaires* the branchiæ?

9. *PROTULA*, *Risso (ex emendatione Cuvieri).*

1. *Pr. intestinum*, *Lamk.*, *testa* magna, tereti, undato-torta, lævi, primum repente, deinde libera. Diam. 5^{mm}.
Animal (secundum Cuvier) branchiis aurantiacis.

Rare. I have never been able to obtain the animal. The synonyma are: *Serpula intestinum*, *Lamk.*, no. 3; Delessert, *Recueil*, t. 1. fig. 7. bene.—*Protula Rudolphi*, *Risso*, *Hist. Eur. Mérid.* iv. p. 406. [*Risso's* description is so different from *Cuvier's* state-

ments, that notwithstanding the authority of Cuvier, and notwithstanding the great mistakes which so frequently occur in Risso's descriptions, we are inclined to doubt the identity.]—*Sabella Protula*, Cuv. Règne Anim., ed. 2. iii. p. 192.

10. PSYGMOBRANCHUS, Ph.

1. *Ps. protensus*, Gm., *testa* tereti, lævi, protensa, elongata, parum versus finem attenuata. Diam. $2\frac{1}{4}'''$.
Animal flavescens; branchiarum filis utrinque ultra 40, albis rubro annulatis; membrana laterali lutea, maculis septem rubris.
Serpula protensa, Gm. p. 3744; Rumph. t. 41. f. 3; Martini, 1. fig. 12 A.

Although Rumphius's figure represents a species from Amboina, I cannot detect in the figure any difference between it and my species.

2. *Ps. cinereus*, Forsk., *testa* filiformi, glabra, varie flexa. Diam. $\frac{1}{3} - \frac{1}{4}'''$.
Animal pallide aurantiacum, branchiarum coccinearum filis utrinque quatuor.
Serpula cinerea, Forsk. fn. arab. p. 128; Gm. p. 3747.

3. *Ps. intricatus*, L., *testa* filiformi, flexuosa, tereti, scabra, medio subcarinata, valde rugosa. Diam. $\frac{1}{3} - \frac{1}{4}'''$.
Animal aurantiacum; branchiarum albarum filis utrinque tribus.
Serpula intricata, L., ed. 12. p. 1265; Gm. p. 3741. Very common.

I am in doubt about the following species, having only seen a single specimen.

- Apomatus ampulliferus*, Ph., *testa* transverse rugata, dorso sulcis duobus longitudinalibus, approximatis bipartito. Diam. $\frac{1}{2}'''$.
Animal operculo nullo; branchiis flavidis, filis utrinque 7, punctis purpureis ornatis; filo uno in vesiculam sphericam terminato.

I should have looked upon this curious formation without hesitation as a monstrosity, if my friend Scacchi had not observed, a few years previously, the animal likewise with the vesicle.

Observation.—In the work 'Actinien, Echinodermen und Würmer des Adriatischen und Mittelmeeres,' by Dr. Grube, there is represented in fig. 11 the bristle of *Serpula latisetosa*. This name does not occur at all in the text p. 90, but there is a *Sabella latisetosa*; and in my copy, pages 57 to 64 are wanting. According to the catalogue, p. 90, the author collected the following species:—

Serpula intricata, L.

—— *glomerata*, L. The Linnæan species is, according to the authorities quoted, *Vermetus triquetra*, Born.

—— *plicaria*, Lam.

—— *infundibulum*, Gm.

—— *vermicularis*, L.

Serpula proboscidea, Gm. Founded on two figures of Martini which I do not venture to explain.

———— *protensa*, Gm.

———— *echinata*, Gm.

———— *contortuplicata*, L.

———— *decussata*, Gm. Founded on Lister, t. 547. f. 4. (copied in Martini, 2. f. 17.) from Barbadoes, and is probably a *Vermetus*: I suspect that Dr. Grube has conceived under this name *Vermetus subcancellatus*, Born.

Spirorbis nautiloides, Lam.

EXPLANATION OF PLATE III.

Fig. A. The operculum of *Serpula vermicularis*, L.

Fig. B. ————— *aspera*, Ph.

Fig. C. ————— *subquadrangula*, Ph.

Fig. D. The operculum of *Placostegus crystallinus*, Sc.

Fig. E. ————— *fimbriatus*, D. Ch.

Fig. F. The operculum of *Vermilia triquetra*, Lam.

Fig. G. ————— *infundibulum*, Gm.

Fig. H. ————— *clavigera*, Ph.

Fig. J. ————— *calyptrata*, Ph.

Fig. K. ————— *multicristata*, Ph.

Fig. L. ————— *elongata*, Ph.

Fig. M. ————— *quinque-lineata*, Ph.

Fig. N. ————— *polytrema*, Ph.

Fig. O. ————— *emarginata*, Ph.

Fig. P. The operculum of *Pomatoceros tricusps*, Ph.

Fig. Q. ————— *Eupomatus uncinatus*, Ph.

Fig. R. ————— *pectinatus*, Ph.

Fig. S. The operculum of *Spirorbis Cornu Arietis*, Ph.

Fig. T. The operculum of *Vermilia triquetra*, Blainv., according to the 'Dict. d. Sci. Nat.' planches. From the description, it would be the operculum of *Serpula vermicularis*.

XIX. — *Catalogue of Irish Entozoa, with observations.* By O'BRYEN BELLINGHAM, M.D., Fellow of and Professor of Botany to the Royal College of Surgeons in Ireland, Member of the Royal Zoological, Geological and Natural History Societies of Dublin, &c.

[Continued from vol. xiii. p. 430.]

GENUS 13. PENTASTOMA.

(Derived from πέντε, *quinque*, and στόμα, *os*.)

Gen. Char.—Body flattened or slightly cylindrical. Mouth situated between two pores upon each side, each pore having a hook-like process projecting from it. The five orifices placed in a lunate manner upon the head.

THE genus *Pentastoma* is named so from the presence of five pores upon the head, the central one being regarded as the mouth. Rudolphi separated it from the genus *Polystoma* with