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XXIV.—*Miscellanea Zoologica*. By GEORGE JOHNSTON, M.D., Fellow of the Royal College of Surgeons of Edinburgh. With Plates VI. and VII.

THE BRITISH NEREIDES.

[Continued from vol. iii. p. 295.]

2. PHYLLODOCE*, *Savigny*.

CHAR. *Body* linear-elongate, with numerous segments: *head* distinct: *proboscis* thick, clavate, the orifice encircled with papillary tentacula: no *jaws*: *antennæ* frontal, small, four or rarely five: *eyes* two: *tentacular cirri* four on each side, unequal, setaceous: *feet* uniramous, overlapped with a leaf-like veined cirrus: *bristles* setaceous, slender, jointed: no *branchiæ*: posterior extremity terminated with a pair of short fleshy *styles*.

Observations. The Phyllodoces are the most beautiful worms† among the Nereides, and are readily distinguished by the series of compressed foliaceous lamellæ, originating immediately above the insertions of the feet, which garnish the sides of the body. The peculiar office of these organs is conjectured to be respiratory‡, but they also aid the animal in its progress through the water, for, following the motions of the feet and capable of being partially altered from a horizontal to a perpendicular position, they act as a bank of oars, and must be especially useful when the worm glides from a solid surface, and finds itself unsupported in the water. Hence the species are quick and lively, and swim with considerable ease§. We have found them buried occasionally in light sand between tide marks; but they principally reside in deeper

* The name of a sea-nymph, of the train of Cyrene.—Virg. Georg. iv. 336. It is synonymous with the *Nereiphylle* of Blainville, but not with the *Phyllodoce* of Ranzani. A genus of plants has been named *Philodice*, and to those who think it against the canon to give the same name to any subjects of Fauna and Flora, this might be a reason to prefer the nomenclature of Blainville.

† “Virgines pulcherrimæ inter Nereides.”—*Otho Fabricius*.

‡ Cuv. Reg. Anim. iii. p. 202. It would be wrong to overlook their resemblance to the branchiæ in the larvæ of the Ephemerides: see Reaumur, Hist. des Insect. vi. p. 468, pl. 45, fig. 2.

§ “Currit egregie; natare etiam valet lamellis suis retroversis oblique sursum erectis.”—*Fabr. Faun. Grœnl.* p. 298.

water amid the roots of corallines and the shells of mollusca and sedentary annelidans*. The body is much elongated and proportionably slender, composed of a numerous succession of similar segments, narrowed gradually towards each extremity, more especially towards the posterior, which is terminated by two short fleshy styles. From the mouth is protruded at will a large proboscis, divided into two rings by a fold sometimes scarcely visible (Plate VI. fig. 3.); the under half on the whole roughened with fleshy papillæ arranged in rows, while a series of larger papillæ encircles the orifice. There seem to be two eyes only†, occipital in position and larger than in the allied genera. The front of the head is armed with four small simple antennæ; and on each side of the post-occipital ring there are two pairs of unequal tentacular cirri, jointed at the base, and usually kept retroverted when the creature is at rest. The feet are rather small, uniramous, furnished with a single spine and a brush of very elegant, slender bristles, divided by a joint near the middle into two portions, of which the terminal one is as sharp as the finest needle. (Plate VI. fig. 6.)

In the *Phyllodoce* the blood is not red as in the great majority of the Annelides, but yellowish or colourless‡.

1. *Ph. lamelligera*, of a dusky-olive or sometimes oil-green; the colour often confined to the margins of the segments. (Plate VI. fig. 1—6.)

Nereis lamelligera, *Turt. Gmel.* iv. p. 90. *Turt. Brit. Faun.* p. 135. *Penn. Brit. Zool.* iv. p. 96. *Bosc, Vers*, i. p. 173. *Jameson in Wern. Mem.* i. p. 557.—*Phyllodoce gigantea*, *Johnston in Zool. Journ.* iv. p. 53.

Hab. Sometimes found at low-water mark, but more common among the refuse brought up on the lines of the fishermen. Deep water in the Frith of Forth, brought up by the oyster-dredges, *Dr. Neill*. Common in Berwick Bay.

DESC. *Body* 14 inches long, linear-elongate, somewhat compressed, tapered at the tail, smooth, dusky with blueish and greenish shades reflecting a metallic lustre, the branchial leaf-

* Audouin and M. Edwards, *Litt. de la France*, i. p. 237.

† According to Lamarck four, "mais les postérieurs sont peu apparens."—*Anim. s. Vert.* 2de édit. v. p. 556.

‡ *Lam. Anim. s. Vert.* 2de édit. v. p. 556. *Ann. des Sc. Nat.* n. s. x. p. 197.

lets generally clouded in the centre with a dark undefined spot. *Head* quadrangular; the *proboscis* covered, on its lower half, with fleshy papillæ arranged in about twelve rows; *eyes* black; *antennæ* very short, conical. *Segments* very numerous, the post-occipital not larger than the following, bearing on each side four rather short setaceous *tentacular cirri*, of which the two anterior are shorter than the posterior pairs, and under these there is a concealed rudimentary cirrus: *feet* all alike, the *superior cirrus* forming an obliquely heart-shaped shortly stalked leaflet, veined, entire, smooth; the *inferior cirrus* is similar in structure and nearly so in figure, but it is about two-thirds less: between them is the proper *foot*, not very protuberant, armed with a brush of bristles disposed in a somewhat semicircular manner, having a single straw-coloured spine in their middle: the *bristles* are slender, pellucid, jointed, the joint being cleft for the reception of the needle-like point: posterior extremity terminated with two very short fleshy *styles*.

This species is said to attain sometimes a size considerably greater than that of the specimen just described, but on this part of the coast one of 14 inches length is rare, while examples varying from 4 to 8 inches are not uncommon. It is liable to much difference in the tints of its colour, and the green often predominates, while in young individuals the colour is not diffused over the segments, but confined to their margins, which are dusky, while the centre may be a pale yellow. In these also the spots in the centre of the branchial leaflets are usually well-marked. These are liable to be slightly affected in their form by the motion and contractions of the worm; and near the tail they always incline more to the oval than the heart-shape. The proboscis is either clavate or cylindrical, according to its degree of protrusion. The worm tints the spirits in which it is preserved with a greenish colour: the body becomes blueish- or greenish-grey, and the lamellæ a uniform olive.

Plate VI. fig. 1. *Phyllodoce lamelligera*, of the natural size. Fig. 2. The head and proboscis, as this appears when half extruded, magnified. Fig. 3. The proboscis fully protruded. Fig. 4. Two segments magnified. Fig. 5. A lateral view of the foot reversed. Fig. 6. The setigerous papilla with its bristles and spine.

2. *Ph. maculata*, the body marked with dark-brown spots in three rows; branchial leaflets somewhat heart-shaped. Plate VII.* fig. 1—3.

Nereis maculata, Linn. Syst. 1086. Mull. Zool. Dan. prod. p. 217. Bosc, Vers, i. p. 171.—*Phyllodoce pulchra*, Johnston in Zool. Journ. iv. p. 54.—The figure of *Baster* (*Opusc. Subs. i. p. 14. tab. iv. fig. 1.*) may possibly be intended for a representation of this species.

Hab. The shore at and within tide marks. Frequent on the coast of Berwickshire.

DESC. Worm sometimes 4 inches long, slender, depressed, tapered a little towards each extremity, yellowish, with a row of dark-brown spots along the back, and the sides spotted with the same colour; ventral surface paler, with a median row of small rather distant spots, and a series of larger ones on each side at the base of the feet. *Head* bluntly pointed, armed in front with four white conical *antennæ*; *eyes* black. *Post-occipital segment* with four pairs of setaceous *tentacular cirri*, of which the two anterior are the shortest: on each side of the other segments there is an oval or somewhat heart-shaped *branchial lamella*, with a brown spot in its centre, and supported on a very short spotted stalk: beneath them are the feet, each *foot* consisting of two papillary processes, the superior furnished with a brush of retractile *bristles* of the usual character. Anal segment terminated with two short conical *styles*.

3. *Ph. bilineata*, slender, pale greenish-yellow, with a continuous dark line drawn down each side at the insertions of the feet. Plate VI. fig. 7—10.

Nereis maculata? Fabr. Faun. Grœnl. p. 298. Turt. Gmel. iv. p. 88.

Hab. On oysters from Preston-pans in the Firth of Forth. Berwick Bay, rare.

DESC. From 2 to 3 inches long, very slender, serpentine, somewhat narrowed in front, more so towards the tail, of a pale greenish-yellow colour, with a dark continuous line along each side, rendered sinuous by the emarginations at the junction of the segments, which are numerous and quadrangular. *Head* ovoid; *eyes* two, placed backwards; *antennæ* four, unequal, placed in a stellate fashion round the orifice of the mouth: *tentacular cirri* rather short, unequal: *branchial la-*

* Pl. VII. will be given in the Supplement to the present volume.

mellæ ovate or elliptical, smooth, veined; the *inferior cirrus* short and papillary, not extending beyond the apex of the *foot*, which is slightly emarginate and armed as usual with a brush of slender jointed *bristles* and a single *spine*.

PLATE VI. fig. 7. *Ph. bilineata*, natural size. Fig. 8. The head. Fig. 9. The middle segments; and Fig. 10. The caudal extremity:—magnified.

4. *Ph. viridis*, body roundish, of a uniform grass-green colour; branchial leaflets lanceolate; antennæ five. Plate VII. fig. 11—15.

Nereis viridis, Linn. *Syst.* 1086. Mull. *Zool. Dan. prod.* 217, no. 2636. *Fabric. Faun. Grœnl.* 297. *Turt. Gmel.* iv. 38. *Turt. Brit. Faun.* 135. *Adams in Linn. Trans.* v. 8. *Bosc, Vers.* i. 171. *Pen. Brit. Zool. edit.* 1812, iv. 94.—*Phyllodoce clavigera*, *Aud. et Edw. Hist. Nat. du Litt. de la France*, ii. 226. pl. 5 a. fig. 9—13.

Hab. Found on *Fucus pinnatifidus*, near Tenby (Pembrokeshire), *Adams*. Berwick Bay abundantly, and I believe it to be common on most parts of the British coast.

DESC. Worm from 2 to 3 inches long, elongate and narrow, slightly tapered towards the head, more so at the tail, of a uniform duck-green colour, paler on the ventral aspect. *Head* small, narrowest in front, but not pointed, the apex armed with four short conical *antennæ*, and a smaller *antenna* is less perceptible on the vertex: *eyes* two*, occipital, dark brown: *mouth* with a large clavate *proboscis*, greenish, rough under the magnifier, with minute papillæ, edentulous: post-occipital segment with four *tentacular cirri* on each side, twice the length of the branchiæ, the anterior pair one half shorter than the others, conical, simple: *segments* very numerous, often defined by a line of deeper green, shorter than their breadth, smooth, convex dorsally: *branchial leaflets* (or superior cirri) lanceolate, slightly compressed, retroflexed, longer than the foot, which is furnished with a bundle of very slender retractile acicular bristles and with a single spine: *tail* terminated with two fleshy *styles*, similar to the leaflets, but rather larger.

P. viridis lives under stones, or in the crevices of slaty rocks, between tide marks; but it abounds most near low-water mark, nor is it uncommon among the corallines and shells that are never left uncovered by the tide. It is an active spe-

* Audouin and Edwards say four, disposed in a transverse line, and very small, but their figure shows two only.

cies in water, moving forwards principally by the oared leaflets that extend from the sides; but on dry ground its movement is slow, and the leaflets are kept applied to the sides and brought somewhat under the body. When kept in a vessel of sea-water, deprived of food, the green colour becomes less intense, and allows us to trace a darker intestine down the centre of the body. When specimens are put into spirits they give out a copious green liquor and tinge the spirit deeply. Immersed in fresh water the worm is evidently pained, but is not killed so instantaneously as some other marine worms are, and in dying does not separate and break in pieces.

I have not hesitated to refer this species to the *Phy. clavigera* of Audouin and Edwards, although some slight differences may be traced in our figures; for some experience has brought me to believe that, in comparing figures which have been made under the magnifier, we are not to look for an exact resemblance between them. I have seen figures drawn by the same individual and from the same objects at somewhat distant periods, but with every desire to be accurate, between which the discrepancy was greater than could have been at first imagined. So also I have not expressed any doubt of their species being identical with the *Nereis viridis* of Otho Fabricius, for the only distinction pointed out by Audouin and Edwards between them is the absence of the odd antenna in the latter, and this is only inferred to be the case from the silence of the Greenland naturalist. But it is no imputation on the acknowledged accuracy of Fabricius to believe that this organ may have escaped his notice; for, even after having been made aware of its existence, I have sometimes found that it was no easy matter to bring it into view and make it perceptible to others.

PLATE VI. fig. 11. *P. viridis*, of the natural size. Fig. 12. The head and anterior segments, magnified. Fig. 13. The head and proboscis extruded. Fig. 14. The middle segments seen from below. Fig. 15. The caudal extremity.

3. PSAMATHE, Johnston.

CHAR. *Body* scolopendriform: *head* small: *eyes* four, in pairs: *antennæ* four, short, unequal, biarticulate: *proboscis* thick and cylindrical, its aperture encircled with a series of

papillary tentacula, edentulous: *tentacular cirri* four on each side, unequal: *feet* uniramous, bifid at the apex; the dorsal *cirrus* elongate, filiform, jointed; the ventral one short: tail with two filiform *styles*.

Obs. This genus, which I have named in honour of the daughter of Nereus and Doris, will take rank, as it appears to me, between *Scyllis* and *Hesione*. It differs from the first in the number and structure of the antennæ, in the form of the head, and in the arrangement of the eyes; and from the latter in the form of the body (which in this family is an important character), and in the structure of the proboscis, which in *Hesione* is very long and destitute of oral tentacula.

1. *Ps. fusca*. Plate VII. fig. 4.

Psamathe fusca, Johnston in *Mag. Nat. Hist.* ix. 15. fig. 1.

Hab. The sea-shore within and between tide-marks. Berwick Bay occasionally.

DESC. Worm scolopendriiform, about an inch in length, slightly narrowed in front, tapered towards the tail, of a yellowish-brown or fuscous colour, and in the paler specimens a series of obscure spots may be observed down each side above the feet. *Head* small, square, entire in front: *eyes* four*, very distinct, occipital, placed in pairs: *antennæ* four, short, biarticulate, frontal, the superior pair thicker and shorter than the inferior: *mouth* furnished with a thick cylindrical *proboscis*, whose aperture is encircled with a close fringe of papulous tentacula: *tentacular cirri* four on each side, the inferior pairs shortest, filiform, jointed, and issuing from a bulged base: *segments* numerous, the anterior shorter and smaller than the others, which are nearly of the same length and breadth: *feet* much developed and prominent, all alike, conic, the apex emarginate or divided into two obtuse lobes, between which the bristles are protruded: superior *cirrus* elongate, filiform, jointed like a *Conferva*, scarcely moniliform, and arising from a swollen basilar joint: ventral *cirrus* short, not extending beyond the foot, neither is it jointed: *bristles* retractile, strong, jointed near the top, the apical piece fixed on in a bayonet fashion; they are collected into two small but unequal fasci-

* I have seen specimens in which there were only two eyes: from their size a pair seemed to have coalesced.

cles, having a rather small *spine* in the middle of each: anal segment truncate and terminated with two long *styles* similar to the tentacular cirri.

This little worm is occasionally met with in Berwick Bay, lurking amid the roots of *Confervæ*, corallines, and sponges. It advances through the water with considerable velocity and in a wriggling manner, pushing out and alternately withdrawing the bristles of its feet, and moving its long cirri in every direction. When the creature is active and first taken, the cirri have a somewhat moniliform appearance under the microscope, but as its energy declines this appearance becomes fainter; they then appear jointed like a common *Conferva*, and after death even these joints fade away and the whole organ assumes a homogeneous structure.

PLATE VII. fig. 4. *Ps. fusca*, magnified. The line expresses the length of the specimen.

4. IOIDA*, Johnston.

CHAR. *Body* linear-elongate: *head* small: *eyes* two, large: *antennæ* three, cranial, filiform, submoniliform: *tentacular cirri* none: *proboscis* —————? *segments* numerous: *feet* undivided, each with a dorsal moniliform *cirrus* and two bundles of bristles, one of which is very long: *branchiæ* none: *styles* ————?

Obs. This new genus is allied to *Scyllis*, from which it differs in the number of eyes, in the absence of tentacular cirri, and in the appendages to the feet,—the *Scyllis* having two cirri to each and a single bundle of bristles,—while the *Ioida* has one cirrus and two bundles of bristles.

1. *I. macrophthalma*. Plate VII. fig. 5.

Hab. Amongst corallines in deep water. Coast of Berwickshire.

DESC. Worm about an inch long and a line in breadth, of a dark blue or purple colour, unspotted, linear-elongate, depressed, smooth. *Head* small but very distinct, pale, rounded in front, entire: *eyes* two, very large, lateral and nearly mar-

* From 'Ιοειδής, blue or violet-coloured. The name is given by Drayton to one of his Naiades:—

“Ioida, which preserves the azure violets.”

Polyolbion, song 20.

ginal, prominent, dark brown : *antennæ* three, frontal, filiform, rather short, equal in size and equally distanced, porrect, faintly annular. *Segments* twenty-five in the specimen examined, distinct, broader than long, the post-occipital and anal considerably less than the others and with proportionably small appendages : *feet* papillary, uniramous, each armed with a dorsal *cirrus* twice as long as the foot, obscurely moniliform, colourless, and with two bundles of bristles, the superior bundles consisting of short stout retractile bristles, jointed near the top, and with a *spine* in their middle ; the inferior bundles of very long setaceous unjointed *hairs*, which the worm has no power of withdrawing. The first pair of feet is destitute of this inferior bundle. The anal extremity was wanting in the only specimen I have yet met with, but from the reparation which had begun I believe it to be terminated by two styles similar to the dorsal cirrus.

[To be continued.]

XXV.—*Descriptions of British Chalcidites.* By FRANCIS WALKER, F.L.S.

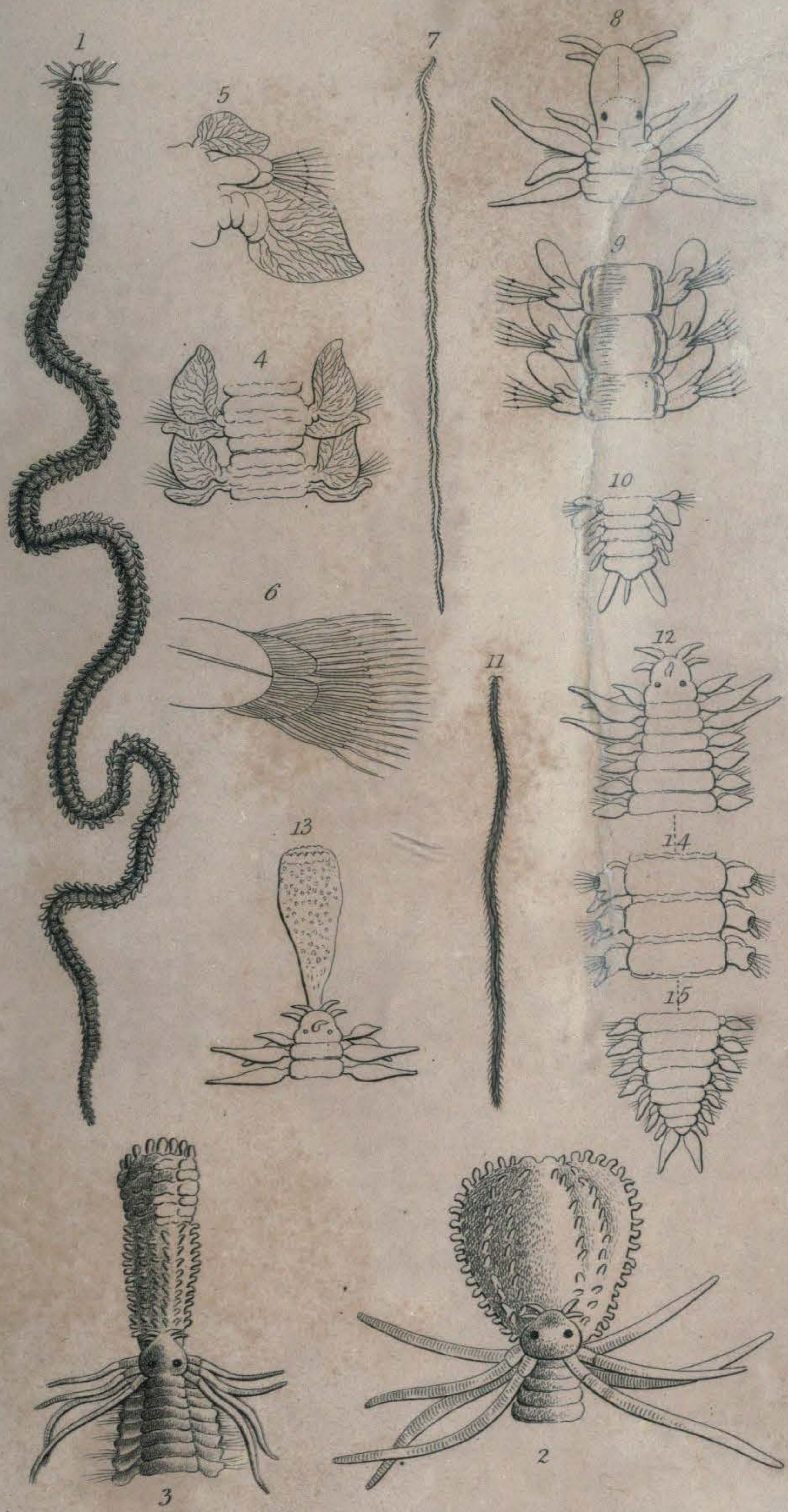
[Concluded from p. 32.]

GENUS PTEROMALUS, *Swederus.*

Fem. P. disco proximus : corpus breve, convexum, parum nitens, scitissime squameum, parce hirtum : caput transversum, breve, thorace latius ; vertex latus ; frons abrupte declivis : oculi mediocres, non extantes : antennæ subclavatae, thorace longiores ; articulus 1^{us} gracilis, sublinearis ; 2^{us} longus, basi ad apicem latescens ; 3^{us} et 4^{us} minimi ; 5^{us} et sequentes breves, approximati, usque ad 10^{um} curtantes ; clava longiovata, articulo 10^o duplo longior : thorax ovatus : prothorax transversus, brevissimus : mesothoracis scutum longitudine paullo latius ; parapsidum suturæ vix conspicuæ ; scutellum conicum : metathorax transversus, mediocris, declivis, postice angustior : petiolus brevissimus : abdomen nitens, læve, latitudine paullo longius, supra planum, subtus carinatum, thorace multo brevius paullo latius : pedes simplices, subæquales : alæ angustæ ; nervus humeralis ulnari fere duplo longior, radialis ulnari paullo brevior cubitali longior ; stigma minutum.

Sp. 1. Pter. Promulus, Fem. *Viridi-cyaneus*, abdomen purpureo-cupreum, antennæ fuscae, pedes flavo-fulvi, femora viridi-picea, alæ fuscae.

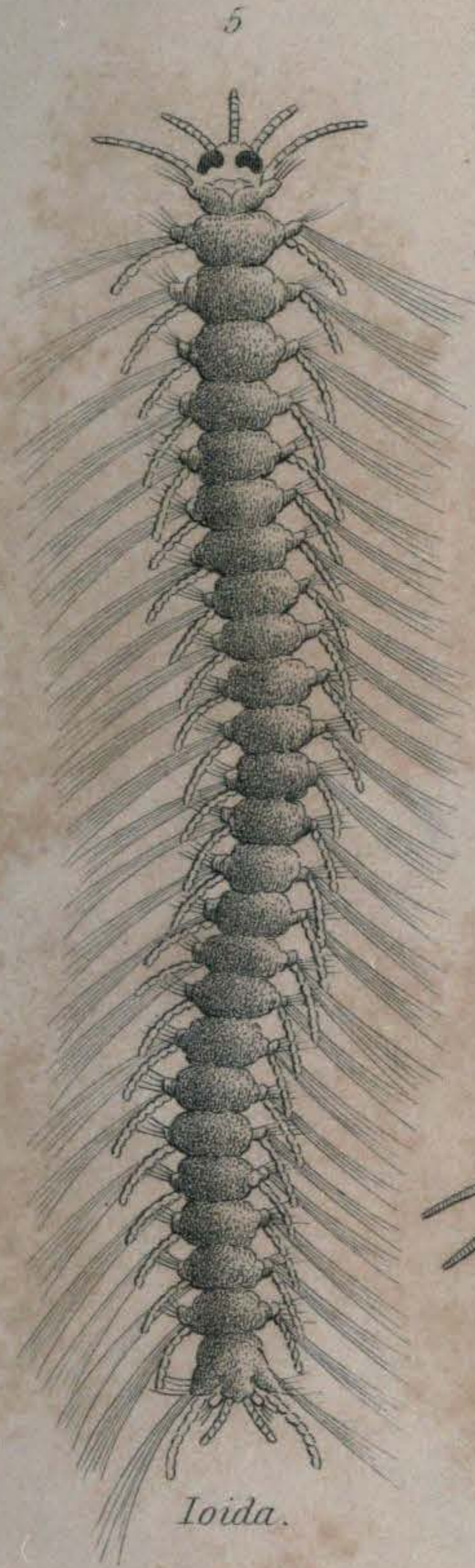
Viridi-cyaneus : oculi et ocelli rufi : antennæ fuscae ; articulus 1^{us} et 2^{us}



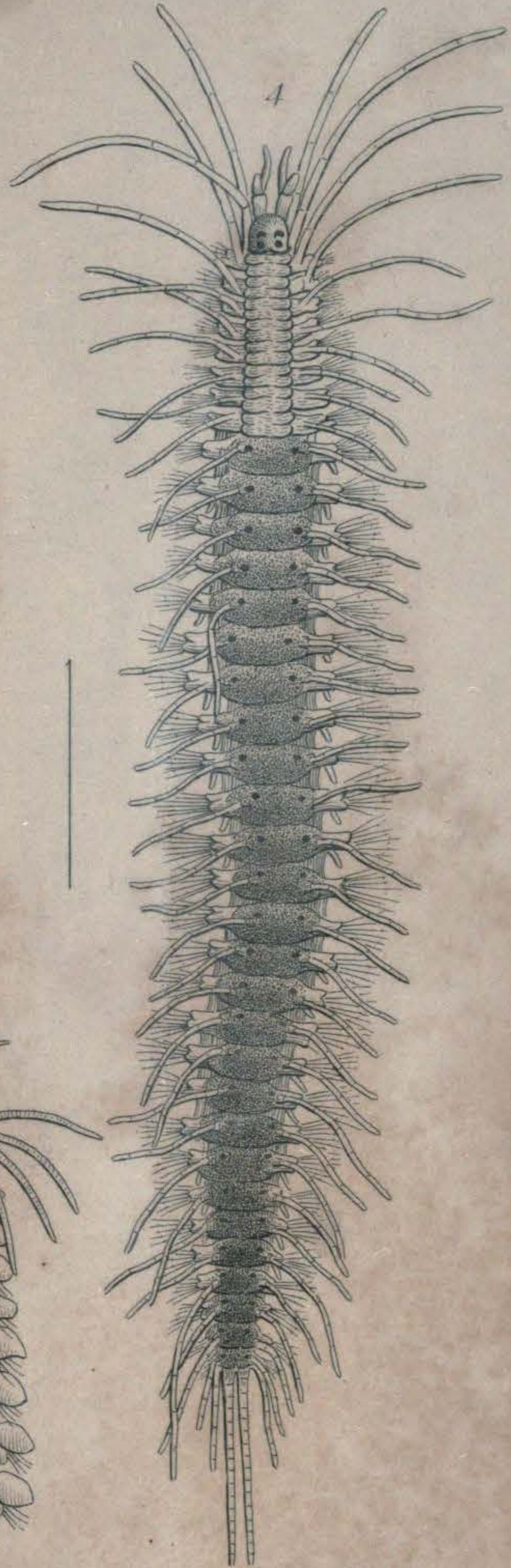
Ed. nat. art.

British Nereides.

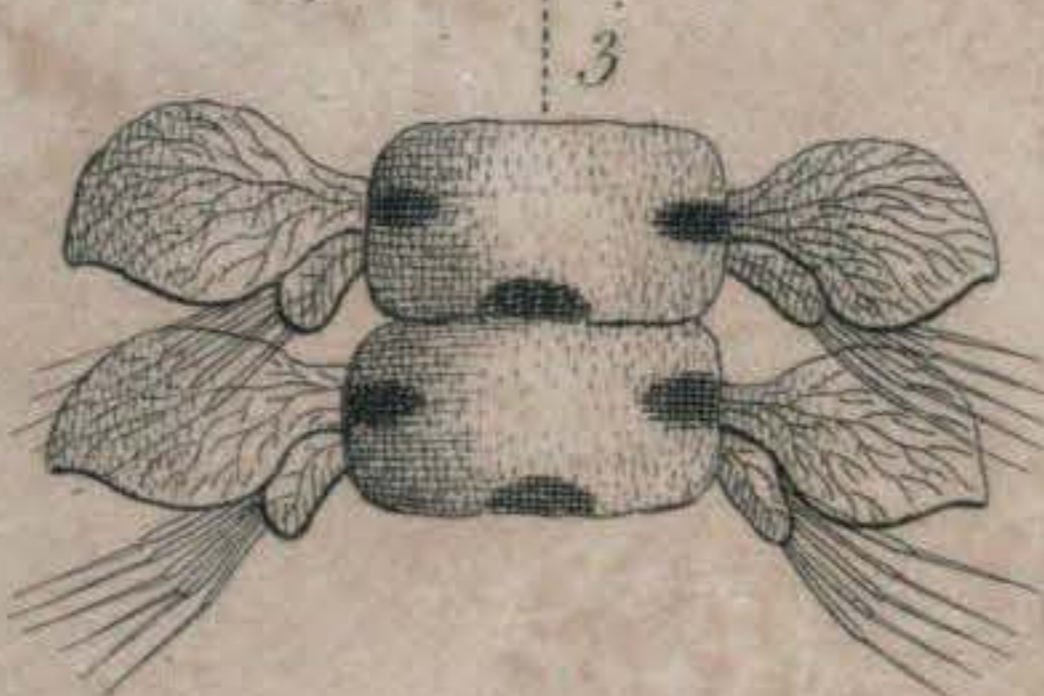
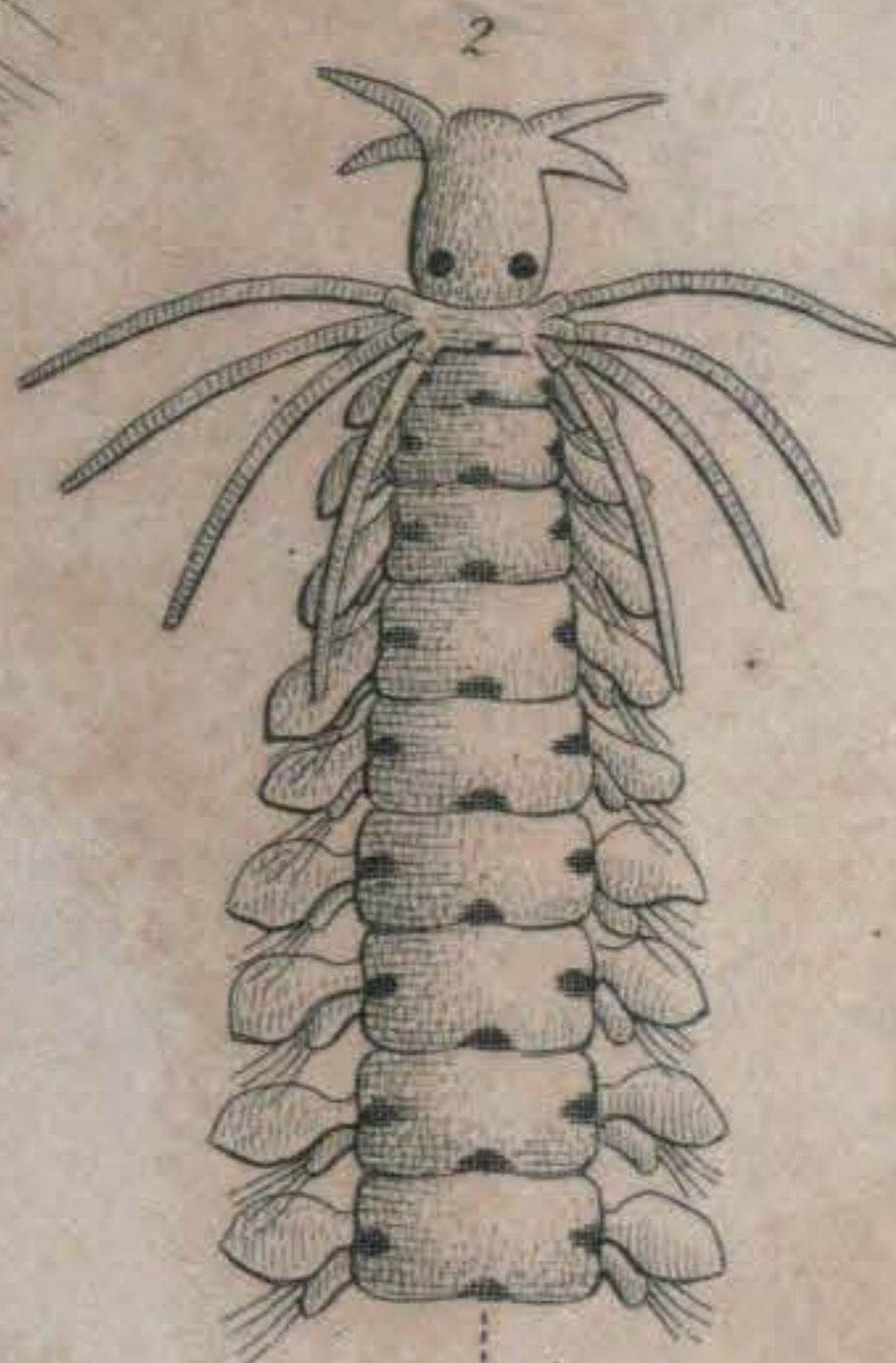
J. Basire sc.



Ioida.



Psamathe.



British Nereides.