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VII. *On British Annelida.* *By* W. C. M'Intosh, *C.M.Z.S.*

Read May 19th, 1874.

[Plates LXVII.–LXX.]

Part I.—Euphrosynidæ, Amphinomidæ, Aphroditidæ, Polynoidæ, Acoëtidæ, *and* Sigalionidæ.

In the first of a series of papers on the British Marine Annelida, which I propose to offer to the Society, one or two reflections which have occurred during the study of the present forms may not be inappropriate, especially as they apply with equal force to the succeeding groups. Few students of the Annelida proceed far in their investigations before becoming aware that in many of the descriptions of their predecessors there is nothing decisive, and that they must wade through many superficial remarks without being able to lay hold of any stable character by which to extricate themselves from doubt. In some cases it would almost seem that the authors meant their successors to spend valuable time to little purpose in vainly endeavouring to find out the exact nature of the species, of which they themselves entertained only a hazy conception. It would appear in the majority of these instances that such inadequate and unsatisfactory descriptions have been due to the fact that the nice distinctions between closely allied forms have hitherto attracted little attention and less study. It is impossible, for example, to describe too minutely in groups like the Polynoidæ, in which the specific separation rests on so many fine characters. The mere statement that a bristle is slender and serrated conveys little more to the mind of an observer than the assertion, in comparing the hair of the bat with that of the sheep, that each is serrated. Even some of the most distinguished modern investigators of the Annelida have failed to appreciate the valuable results derived from a strict and faithful apprehension of the structure of the bristles, the other characters of course being duly attended to. If, instead of writing pages of weary Latin descriptions, a few terse sentences had been given, and a single characteristic bristle accurately figured by the author, very great labour and not a little doubt would have been saved to his successors. The characteristic markings at the tips of the bristles of *Hermadion pellucidum* and *H. assimile*, for instance, show how valuable such characters will some day be in classification. The same peculiar feature is exhibited by the *Gastrolepidia clavigera* of Schmarda in the upper series of the ventral branch of the foot, and in the whole of the dorsal bristles; moreover their transparency is remarkable. The distinctions between many of the species are nice, yet exact, and afford a good field for

scientific accuracy in microscopic work. Thus the three forms *Harmothoë sibbaldii*, *H. zetlandica*, and *H. macleodi* would not readily strike the observer as specifically different from each other or *H. imbricata*. It is possible that the *Parmenis ljungmani* of Malmgren may refer to one of them; but the want of precision in description and figures makes it impossible to find out without an actual reexamination of the original specimen. A wide field also remains in regard to the sexual variations of the bristles; but it will be easy to accomplish this matter if once the true character of each bristle is appreciated and accurately figured. Moreover, just as the bristles of a species show a tendency to adhere to the same type in all their characters (for instance, in the Polynoidæ), the cilia on the scales, tentacle, antennæ, tentacular and dorsal cirri, and the form of the tips of the latter organs preserve a similar uniformity.

Further, in delineating the structure of the Marine Annelids it is absolutely necessary to have an artist who is sensitively alive even to a tendency to variation in a character of a particular part; it is deficiency in this respect that makes the voluminous plates of many authors of little scientific value. It is well if the author himself uses his pencil; for a mere artist, however skilful, almost always fails to appreciate the nice distinctions upon which so much depends. I have seen only one who fulfilled the requirements of science in this respect. Malmgren's artist, for example, represents the spinous rows in the bristles of the Polynoidæ as opposite instead of alternate, yet he is one of the best delineators of the group in modern times. The engraving of an accurate drawing is often sufficient to alter the character of some of the minute points; and it is not to be supposed in the case of an inaccurate one that this process will improve the original.

The collection from which the following descriptions are drawn up has been the result of many years' labour. Amongst others, Dr. Gwyn Jeffreys most kindly handed over his valuable and extensive collections from Shetland, the Hebrides, and the west coast of Ireland; the late Dr. Baird sent specimens from Cornwall and other parts; Dr. Perceval Wright favoured me with the examination of the late Mr. Thompson's collections, as well as those found by himself on the west coast of Ireland; Mr. More likewise sent specimens collected in the latter region; and Dr. Carrington forwarded a collection from Southport; Mrs. Collings, Prof. E. Ray Lankester, and Dr. Cooper gave me some from Guernsey and Herm; Prof. G. S. Brady, those dredged on the coast of Durham; Dr. Howden, many from the deep water off Montrose; Dr. John Grieve from the Frith of Clyde; and Dr. Albert Günther, Professors Ogilvie and Dickie, some from the North Sea; while Mr. Spence Bate and Mr. Rowe sent a collection with drawings from Plymouth and neighbourhood; and I am also much indebted to the late Dr. J. E. Gray, of the British Museum, and to the late Mr. G. R. Gray for their invariable courtesy in giving me every facility for examining the national collection of the Annelida; and to Mr. Smith and the other Assistants in the Zoological Department for their kind aid on many occasions. The British coast has been explored by myself at many points, from the Shetlands to the Channel Islands.

EUPHROSYNIDÆ.

Euphrosyne foliosa, Aud. & Ed. In Dr. Johnston's Catalogue of the Annelida in the British Museum, two species of *Euphrosyne* are described, viz. the above-mentioned *E. foliosa* and *E. borealis*, Œrst. So far as can be observed, however, there seems to be considerable confusion in regard to the common species. It is possible that the *E. myrtosa*, Sav. (Ehlers), *E. foliosa*, and *E mediterranea* of Grube, may refer to the same animal. The common species (*E. foliosa*), at all events, ranges from Shetland to the Channel Islands, and especially on the west coasts of Great Britain and Ireland. Little reliance can be placed on the length of the bristles and branchiæ, the former being generally much larger in young specimens. I have also some hesitation in considering the *E. racemosa* of Ehlers[1] other than a variety of the common species.

Euphrosyne borealis, Œrst.[2] A specimen of this species occurs in the collection of the British Museum under the name *E. foliosa*, Aud. & Ed., from the Frith of Clyde. The branchiæ have much larger and less acute tips than in *E. lanceolata* from the 'Porcupine;' and the bristles are also characteristic.

The only occasion on which *Spinther oniscoides*, Johnst., occurred was in the Minch, off North Uist. It had the usual yellow hue; and the body was flanked by a series of lamellæ with long bristles and opaque white spots. The bristles of the lateral processes were united together by a delicate granular stroma, so that under the microscope each had a granular appearance. They are arranged with considerable regularity; and all are peculiarly curved (Pl. LXVII. fig. 1, and a somewhat shorter and stouter form, more highly magnified, in fig. 2). There are some obscure markings in the fork of the bristle. In the centre of the dorsal branch of the foot are also some simple bristles. The ventral cirrus has one conspicuous hook (fig. 3) projecting from the soft papilla, generally another of similar form (but shorter) within the foot, and the distal curved parts of other two embedded in the tissues. Numerous simple bristles with tapering tips support the chief hook. The forked bristles on the dorsal surface are similar to the stouter series in the dorsal branch of the foot, but, on the whole, have stronger shafts and more tapering tips.

AMPHINOMIDÆ.

Of this family the only British representative yet encountered is the *Eurythoë borealis* of Sars, which extends from Shetland to the Channel Islands, occupying deep water in the former, and the littoral region in the latter. A description is given in the 'Transactions' of the Royal Society of Edinburgh (vol. xxv. p. 406) under the head of *Amphinome vagans*?, Leach.

[1] Die Borstenwürmer, i. p. 67, taf. i.

[2] Grönlands Annulat. dorsib. p. 170, f. 23–27.

APHRODITIDÆ.

In the Catalogue of the British Museum three species of this group are described, viz. *Aphrodita aculeata*, L., *A. borealis*, Johnst., and *Hermione hystrix*, Sav. An examination of Dr. Johnston's specimens from Berwick Bay (in the British Museum) shows that his *A. borealis* is the young of the first mentioned. A third species (*Lætmonice filicornis*, Kbg.) is not uncommon from Shetland to the Atlantic south of the British Channel.

POLYNOIDÆ.

Eight species are indicated in the Catalogue, viz. *Lepidonotus squamatus*, L., *L. clava*, Mont.[1], *Evarne impar*, Johnst., *Eunoa nodosa*, Sars (as *L. pharetratus*, Johnst.), *Dasylepis asperrima*, Sars (as *L. pharetratus*, Baird), *Lagisca propinqua*, Mgrn. (as *Lepidonotus semisculptus*), *Nychia cirrosa*, Pallas (as *L. imbricatus*), and "*L. pellucidus*," probably a young form of some of the foregoing.

Eunoa nodosa, Sars, was first dredged by Lieut. Thomas, and termed by Dr. Johnston *L. pharetratus*; Prof. E. Ray Lankester, from a specimen procured in Shetland by Dr. Gwyn Jeffreys, named it *Antinoë zetlandica*. It has a very wide range. Dr. Malmgren vouches for the specimen in the British Museum; and accordingly, though it is in bad condition (apparently having been dried), it has been figured. A dorsal bristle is represented, Pl. LXVII. fig. 4, and a ventral in fig. 5, both mounted in balsam, fig. 6 being another in water. The bristles of a specimen from the coast of Durham are given in Pl. LXVII. figs. 7, 8, the former representing the dorsal, the latter the ventral.

Dasylepis asperrima, Sars. This was first recognized as British by Dr. Malmgren (in the British Museum, where it was labelled *Lepidonotus pharetratus*). The specimen had been sent to the late Dr. Baird by Mr. D. Robertson from the Frith of Clyde. The great density of the dorsal tufts of bristles gives the animal a woolly appearance; and their ferruginous colour is also peculiar. The length of the example is about one inch. The head has two large eyes at the posterior border, and one on each side on the median prominence. The scales are roundish in front, reniform posteriorly, and boldly armed on the posterior and outer margins and the neighbouring surface

[1] The *Aphrodita punctata* of O. Fabricius may be this form; but it is doubtful what connexion the *L. punctatus* of Œrsted in his 'Grönlands Dorsibr.' has with it. He evidently means the common *L. squamatus* in his 'Annulat. Danic.' The *Polynoë fuscescens* of De Quatref. (Annél. i. p. 242) appears to be intimately allied to *L. clava*; and the same may be said of his *P. modesta* and the *P. clypeata* of Grube. The *Polynoë levis* of Aud. & Ed. (including in the diagnosis the allusions afterwards made to it by H. Rathke, M. Sars, and De Quatrefages), does not seem to be this species; indeed I have sometimes thought, from the descriptions of Audouin & Edwards and De Quatrefages, that this *P. levis* might be a variety of *P. setosissima* with fourteen pairs of scales. The *P. grubiana* of Claparède may be a variety of *L. clava*, since he does not distinguish it from the latter while contrasting it with *L. squamatus*.

with long pointed spines, a few having a bifurcation at the tip, or a series of blunt points. No cilia are present. The difference between this scale and that of *Polynoë areolata*, Grube, is marked; for the arrangement on the surface of the scale is not only more regular in the latter, but the spines are much larger, less acute, few in number, and surrounded by a series of exquisite reticulations, while the margin is densely ciliated, especially at the outer and inner borders. The dorsal bristles are long (only a little shorter than the ventral), and much tapered at the tip (Pl. LXVII. fig. 9). The tips of the ventral bristles are also elongated, and show a distinct process below the curve (figs. 10, 11).

Lagisca propinqua, Mgrn. A specimen of this species occurs in the British Museum, from Shetland. It is possible that the *Lepidonotus semisculptus* of Dr. Johnston, from the south coast of Devon, may be this form; but the original example has not been seen. A young specimen was found in the débris of the boats from deep-sea fishing off St. Andrews Bay. In this condition it is distinguished by the scabrous greyish scales mottled with black, the dark spots at the bases of the feet, and the coloration of the dorsum beneath the scales, by the form and position of the eyes, and the structure of the bristles.

The head is curiously mottled. A pale band of considerable breadth occurs posteriorly, boldly defined by the blackish collar of the first body-segment. A pale band runs from this forward in the central line to the base of the tentacle, which is blackish; and the anterior angles of the head thus mapped off are brownish red, with dark grains along the edges. The posterior pair of eyes are large and widely separated, and situated on the pale band of the region. The anterior pair are not observed from the dorsum, being placed laterally exactly at the junction of the pale posterior and the coloured anterior regions. The tentacle is absent. The antennæ are short, brownish at the base, furnished with long and clavate cilia, and a filiform tip. The palpi have a dense series of minute papillæ with enlarged tips. The tentacular cirri have a blackish patch at the base, a light brownish one on the slightly dilated portion near the tip, then a whitish patch, and, lastly, a dark brown one at the base of the filiform termination; they possess long cilia with globular heads. The dorsal cirri have a similar colour to the latter. Besides the long cilia with the globular heads on the column of the organ, some shorter cilia proceed upward rather beyond the lower third of the extremity. The ventral cirrus is subulate, with sparsely distributed and short papillæ.

The scales are dull greyish, with a dark patch in the centre. On the dorsal surface the blackish pigment is broken into fragmentary portions. On the under surface, again, it is more uniform. The outer and posterior edge of the scale is ciliated; as indeed is the greater part of the circumference. The cilia commence as short, almost baccate processes, and toward the outer edge assume the form of long organs with nearly globular extremities, the series again diminishing to terminate in short papillæ. The

greater part of the surface of the scale is densely covered with minute and rather blunt horny spines, which toward the free edge become large acute processes. The extreme roughness of the surface of the scale readily causes mud and débris to lodge. In shape the scales are for the most part reniform. They therefore present a marked difference from those of the Zetlandic specimen (which show small papillæ over the surface, a few large pale examples only projecting beyond the free edge, and eight or nine subglobular processes at intervals in the same region), as well as from the form described by Malmgren.

The dorsal branch of the foot bears a somewhat dense mass of rather short pale bristles with a slight curvature. The tips are comparatively short, and by no means acute. One of the longer forms is sketched in Pl. LXVII. fig. 12. The ventral division has translucent bristles with moderately long shafts. The tips of the superior series (Pl. LXVII. fig. 13) are long and somewhat taper, with rather distant rows of long and distinct spines, the end being minutely bifid. The tips gradually become shorter and stouter inferiorly (fig. 14), the strongly curved terminal division, and the inferior process, with its characteristic angle of incidence, being noteworthy. Some of the latter bristles show traces of a curve outward between the secondary process and the first row of spines. Toward the ventral border the secondary process diminishes with the general size of the bristle; there is a minute trace, however, in almost all. It is difficult to separate these bristles from those of the larger example (with smoother scales) from Shetland.

Malmgrenia castanea[1], n. sp. Dredged by Dr. Gwyn Jefferys off North Unst, Shetland, in 90–96 fathoms, in 1867, and again, in 1868, on *Spatangus purpureus* (near the mouth), in 85 fathoms, on shell-sand. The same gentleman procured it in 80 fathoms, off Valentia (S.W. Ireland), and 110 fathoms off the Blasquet. It has also been found in the Channel Islands.

Two species only are mentioned by Malmgren as having smooth palpi, antennæ, tentacles, and cirri, viz. *Melænis loveni* and *Enipo kinbergi*. The first is easily distinguished from the present form by the fact that the scales leave the centre of the dorsum uncovered anteriorly, while in the second the scales occur only on the anterior part of the body. Both diverge much in the structure of the bristles. In this form the head is slightly pinkish in life, as is also the proboscidian region. Two eyes are situated near the posterior border, and two laterally on the anterior prominence. The tentacle is moderately developed, and has a slight enlargement below the tapering tip. The antennæ have brownish pigment a little above the base. The scales are fifteen pairs, smooth to the naked eye, but under the microscope showing some minute papillæ in the line of the pigment, and a more distinct group opposite the curve or covered

[1] The generic name is in honour of Dr. Malmgren, of Helsingfors, the author of the valuable 'Annulata Polychæta Spetsbergiæ,' &c.

anterior border of the scale. The first pair are rounded; but the next are reniform or irregularly quadrate. They are surrounded by a madder-brown belt, with a tendency to the development of a denser portion in the anterior band. Some specimens have the centre of the scale likewise filled up with pigment, which also becomes deeply tinted. Every cirriform process is perfectly smooth, presenting neither wart nor granulation. The dorsal cirri taper much less than in *Hermadion pellucidum*, Ehlers: and there is a slight enlargement toward the tip, of a different character from that in the latter; and the organs are shorter. The under surface of the body is iridescent pinkish.

The bristles are pale, and the dorsal much shorter than the ventral. The former are slightly curved, taper toward the tip, and are faintly serrated (Pl. LXVII. fig. 15). The tips of the ventral bristles are short, and present the usual gradational series from above downward. The ordinary appearance of one of the superior ventral bristles is shown in Pl. LXVII. fig. 16: scarcely any trace of the minute process is seen below the tip; and it disappears altogether ventrally (fig. 17). The developing forms, however, have this clearly indicated (Pl. LXVII. fig. 15). In specimens from Valentia (S.W. Ireland) the process is very distinctly seen—for instance, when the bristle is slightly turned round (Pl. LXVII. fig. 18). It would also appear that the process is developed at the end of one of the spinigerous rows, and is therefore lateral in position. A well-formed Irish specimen is represented in fig. 19. The secondary process is less marked in the examples from the Channel Islands and Shetland, though indications are present in all.

The specimens found near the mouth of *Spatangus purpureus* are of a deeper madder-brown or chestnut hue on the scales and cirri.

Malmgrenia andreapolis, n. s. Not uncommon in the débris of the boats from deep-sea fishing, on the West Sands after storms, and in the stomachs of cod and haddock, St. Andrews. It is a species of some size, a few of the incomplete specimens being about an inch in length and about one fifth of an inch in breadth. It is readily distinguished by the persistent brown ring on the scales after preservation in spirit. The first pair of scales have a brown ring all round their border, and a brown spot in the centre. The second scale has a brown ring round the exposed part, and a patch near the outer border anteriorly, representing the spot in the centre of the first pair and that of the scales behind. Those after the second have a ring more or less complete, the broadest part being toward the inner margin, and the spot at the end of the anterior leg of the V-shaped mark becoming more evidently separated. About the sixth or seventh pair the V-shaped mark and the spot become distinct. The number of scales seems to be considerable; but as none of the specimens were complete it could not be determined. They are nearly smooth, a few small papillæ (under a power of 350 diam.) being grouped in a limited area on the outer border, and no trace of these appears beyond the margin.

The head is slightly tinted with brown. Two eyes are situated toward the posterior border and two on the lateral prominence in front. The tentacle is incomplete in all; the antennæ are small, with two brown rings at the base. The palpi are tapering and quite smooth. The tentacular cirri are brownish, and have a few clavate papillæ. The dorsal cirri are stout, brownish, and in spirit taper from base to tip. They have a very few clavate papillæ. The ventral cirri are slender and tapering, and do not reach, by a considerable way, the tip of the foot.

The feet are much developed. The dorsal division bears a series of slender, inconspicuous, translucent bristles with a peculiar tip, which forms a kind of knob, of much interest when contrasted with those of the ventral branch, since it shows how closely the same type holds in both divisions. One of the larger bristles is represented in Pl. LXVII. fig. 20. The superior examples in the ventral branch have an elongated, tapering, spinous portion (Pl. LXVII. fig. 21), with a distinct round knob at the tip. The shafts of all the ventral bristles are long and pale. The tips quickly shorten (from above downward), the claw (a modification of the knob) being quite characteristic; and there is a secondary process beneath (Pl. LXVII. fig. 22). Toward the inferior border some have no secondary process (fig. 23), but a very distinct knob at the tip, an intermediate series, of course, occurring between the first and last.

Harmothoë sibbaldii[1], n. s. This species ranges from Shetland to Cornwall. At first sight it appears to be a boldly marked variety of *Harmothoë imbricata*; but a closer inspection shows the distinction both from the latter and *Parmenis ljungmani*, Mgrn., a species which has short-tipped ventral bristles with a deep fork. It is recognized superficially by its somewhat firm, elongated body, and the remarkably dark (blackish) pigment of its anterior scales. It is about seven tenths of an inch long.

The head is characterized by the pointed nature of the anterior lobes and by the position of the eyes. Two of the latter are placed at the posterior border, almost under the fold of the first segment, and two on the under surface of the pointed anterior lobes, though the pigment shines through the dorsum. The pairs are thus separated by a considerable antero-posterior interval. The tentacle has an enlarged basal portion, a brownish column, a pale tip with little or no enlargement beneath, and is covered with clavate papillæ. The antennæ are small and brownish. The palpi are brownish, with rows of small blunt papillæ, which are sometimes bifid at the tip. The tentacular cirri are also brownish, furnished with clavate papillæ, and slightly enlarged below the tip. The buccal cirri are brownish. The number of the bristle-hearing segments was thirty-seven; and the animal seemed nearly complete.

The scales are fourteen pairs. The first are small, and nearly circular, their light brownish colour contrasting strongly with the succeeding. The second pair are reni-

[1] Named after Dr. John Sibbald, F.R.S.E., Deputy Commissioner in Lunacy, who displayed much courtesy in Shetland, where he happened to be visiting when the author was dredging in 1871.

form, with the exposed parts almost uniformly black. The third are also very dark, with a few minute pale points. The latter increase in size in the succeeding scales; and the pigment becomes less dark as we proceed backward, the posterior scales being mottled like granite. The scales increase in size from before backward, the last pair, however, being diminished, especially in breadth. The dark anterior scales have a peculiar sheen in certain positions, and microscopically have the best-marked papillæ, a few of which project at the posterior edge as short clavate processes. None of the latter occur on the edge of the posterior scales.

The superior branch of the foot has a short cirrus, the tip of which just reaches the extremity of the bristles in spirit. It is almost cylindrical, except near the tip, where a gradual diminution occurs. The surface is furnished with a few stout clavate papillæ, best developed just beneath the filiform part at the extremity. The inferior cirrus has an enlarged base, reaches a little further than the insertion of the inferior ventral bristles, and has a few clavate papillæ.

The bristles are comparatively short. The dorsal branch of the foot has a series of somewhat short and not very stout bristles, slightly curved, and finely serrated in the usual manner. The tips are peculiar, being fashioned rather like a blunt harpoon or paper-scraper, as represented in one of the larger examples (Pl. LXVIII. fig. 1). The spinous rows at the upper part stand out characteristically at a greater angle than usual. The ventral bristles are translucent, with comparatively short spinous tips, and are boldly bifid, but after a different manner from the attenuated divisions of *Parmenis ljungmani*. One of the superior series is shown in Pl. LXVIII. fig. 2; and it is noticed that both terminal divisions are somewhat blunt when contrasted with a bristle from the inferior series (Pl. LXVIII. fig. 3).

This species, then, presents the following differences from *Parmenis ljungmani*. The body is larger and broader, the segments thirty-seven, instead of thirty-five or thirty-six, the anterior eyes are situated very much in front of those in Malmgren's form, being almost at the tip of the pointed anterior lobes. The scales are fourteen pairs instead of fifteen; but this is not of much consequence. The dorsal bristles are slightly thicker than the ventral, and have the peculiar tips, and the ventral differ in structure—features diverging from Malmgren's species. Some of these characters may be exaggerated, owing, perhaps, to the want of scientific accuracy in Malmgren's artist; and there are many points of similarity between them, so that, unless the bristles had diverged so much, I should have been inclined to unite them.

Harmothoë zetlandica, n. s. Dredged in 5 fathoms, amongst the tangle-roots, in Bressay Sound. The specimens are small, about half an inch long, with an elongated and somewhat linear body, consisting of about thirty-five bristle-bearing segments. The colour in spirit is uniformly pale yellow, the scales having only a few pale touches.

The head has two pointed anterior lobes, and very distinct eyes. The posterior pair

are situated at the posterior border, and the anterior toward the front, of the cephalic prominence, but not so far forward as in *H. sibbaldii*. The tentacle is short, not much, if any, enlarged below the filiform tip, and furnished with a few clavate papillæ. The antennæ are short, enlarged at the base, and taper at the tip (after the manner of the ventral cirri), and with sparse but distinct clavate papillæ. The palpi are gently tapering from base to apex, and have minute papillæ under a high power (they are smooth or only wrinkled under a low power). The tentacular cirri taper from base to apex, have no enlargement below the latter, and, similarly to the antennæ, are supplied with clavate papillæ. The cephalic appendages are rather short. The dorsal cirri resemble the latter; and their tips reach anteriorly to the extremity of the ventral bristles. The ventral cirri are enlarged at the base, and have a few clavate papillæ.

There are fourteen pairs of scales, smooth under a lens, but showing sparsely distributed clavate papillæ along the posterior border, and over the usual area, under a high power. The first pair are small and round, the size increasing posteriorly till the twelfth, when a diminution again occurs in the thirteenth and fourteenth. Most are rather ovoid than reniform.

The dorsal bristles are divergent, stout, sharp-pointed, and extremely brittle. A lateral view of a large specimen is given in Pl. LXIX. fig. 1. There is a slight bend at the tip, as well as a marked curve in the shaft. A front view of another is exhibited in Pl. LXVIII. fig. 4. The ventral bristles have superiorly a short spinous region and a long bifid tip (Pl. LXVIII. fig. 5). The tips diminish as usual toward the ventral edge of the fascicle, a few of the lowest having no distinct secondary process at the termination.

Contrasted with the young of *Harmothoë imbricata*, the head of this form is much more elongated antero-posteriorly; and the four eyes are visible from the dorsum, whereas in *H. imbricata* the posterior pair only are generally seen. The tentacle, antennæ, and other cephalic processes are different. The bristles are much larger in *H. imbricata*, so as to give a different outline; and their structure and the scales are essentially at variance. From the *Parmenis ljungmani* of Malmgren it differs in the number of the scales, their colour, the structure and size of the dorsal bristles. Its nearest ally seems to be *H. sibbaldii*. The *Polynoë vasculosa* of M. Claparède[1] likewise approaches it.

Polynoë floccosa, Sav. This species seems to be in want of careful revision, since it is doubtful if M. de Quatrefages, unless he had Savigny's specimen, would be able to decide with accuracy what the older author meant. It is the *Harmothoë sarniensis* of Prof. E. Ray Lankester[2], and abounds all round our coasts, from Shetland to the Channel Islands. It is distinguished from *H. imbricata* by the general colour of the dorsum,

[1] Annél. Chétop. du Golfe de Naples, Supplément, p. 12, pl. i. f. 4.

[2] Trans. Linn. Soc. vol. xxv. p. 374, tab. 51. f. 14, &c.

the position of the eyes (only the posterior pair, as a rule, being visible in *H. imbricata* —in which there is a much larger interval also between the anterior and posterior pairs than in this form; indeed the anterior pair are near the anterior border, whereas in this they are just halfway forward), and the number of the scales (sixteen to twenty pairs), which, with the dorsal cirri, have larger and more slender cilia than in *H. imbricata.* The ventral papilla is smaller than in the latter. The structure of the bristles, moreover, is characteristic. In looking over spirit-preparations in which both forms are mixed, there is a trimness in the line of the bristles, and a general firmness which is peculiar to *P. floccosa*, and the dorsal and other cirri are shorter, and have no enlargement below the tip.

The dorsal branch of the foot has rather long and more distinctly tapering bristles than in *H. imbricata*, from which, moreover, they are at once distinguished by the much closer spinous rows. Bristles of the same length are decidedly more slender in this species than in *H. imbricata.* One of the longer forms is represented in Pl. LXVIII. fig. 6, and it may be contrasted with one from a large *H. imbricata* (Pl. LXVIII. fig. 7). The tip tapers to a blunt point; and immediately below the bare portion very fine and close spinous rows occur. A glance at the latter in running over specimens is one of the most satisfactory points in discrimination. The ventral division bears superiorly a series (Pl. LXVIII. fig. 8) with long spinous tips (more slender and with longer spinous processes than in *H. imbricata*, Pl. LXVIII. fig. 9) and smooth extremities, one or two having no secondary processes. Then a small secondary process appears, and the spinous portion gradually diminishes in length, one of the stout examples from the middle of the foot being shown in Pl. LXVIII. fig. 10. It will be observed that this bifid tip differs quite from that of *H. imbricata* (Pl. LXVIII. fig. 11), from a similar part, and especially in the minute size of the secondary process. The spinous rows are also larger and more distinct. Some of the inferior ventral bristles are devoid of the secondary process. The *Polynoë foliosa* of Savigny[1] seems to come near this species. Savigny only mentions sixteen pairs of scales; but specimens often vary in this respect.

Harmothoë areolata, Grube. A complete description of this remarkable form is not necessary on the present occasion; for Prof. E. Ray Lankester (his *Antinoë nobilis*) and others have indicated the general structure since the original account by Grube (his *P. areolata*). It may be mentioned that this species has the same arrangement of its eyes as *Harmothoë*, two being at the posterior border of the head, and two under the lobes in front. The dorsal group form a rather conspicuous tuft of elongate slightly curved bristles, the curve being about the middle of the latter, so that the bristle is bent like a bow in the exposed part (Pl. LXVIII. fig. 12). The spinous rows are dense; then the tip is smooth for some distance, and has a slight though distinct streak, best marked

[1] Syst. des Annél. p. 23.

in the shorter forms, in which it grooves the extremity. The ventral branch has a series of rather slender bristles with tapering tips. Superiorly the latter are alternate, with only a trace of the secondary process; and it is sometimes broken off, so that the tip appears simple—a condition, indeed, apparently normal in some. One of the superior attenuate forms is represented in Pl. LXVIII. fig. 3. The pectinate or spinous rows are rather prominent. One of the best-marked shorter forms, with a somewhat worn extremity, is given in Pl. LXVIII. fig. 14. Toward the inferior border the bristles again have attenuate tips, with a very slender secondary process; and in some the latter is absent. The ventral cirrus reaches beyond the base of the bristles, and has somewhat slender clavate papillæ. The remarkable condition of the dorsal cirri has been noticed by Prof. Lankester; once, indeed, I received from a correspondent detached specimens which were supposed to be "parasites." The structure of the scales is most elaborate. In Britain this species was first found by Prof. Lankester in the tubes of *Terebella nebulosa*, and afterwards by Mr. Cooper in the tubes of *Chætopterus*, and by myself frequently under stones at Herm. It appears to be figured by O. G. Costa in Tav. 2 of his 'Annel. di Napoli,' 1857.

Harmothoë macleodi[1], n. s. Found between tide-marks, Lochmaddy, North Uist, Shetland, and in the stomach of the cod, St. Andrews. Body elongated, rather narrow, and with comparatively short bristles; segments thirty-five. Head elongated from before backward, and with distinct eyes similarly placed to those in *H. zetlandica*—two at the posterior border, and two at the side in front of the middle line, all being visible from the dorsum. Palpi similar, as also are the tentacle, antennæ, and tentacular cirri, which have clavate papillæ. The scales appear to amount to fourteen or fifteen pairs, are pale, semitranslucent, and with a very few short papillæ along the outer and posterior border. The scales are arranged like those in *H. zetlandica*, circular in front, and increasing in size to the last two pairs. The dorsal cirri scarcely extend beyond the bristles, are slender, tapered from base to apex, and furnished with sparsely distributed clavate papillæ, which leave the tip bare. The ventral cirrus has a large base and a few clavate papillæ.

The bristles of the dorsal branch of the foot differ from those of *H. zetlandica*, since their spinous rows continue to the tip of the organ. They are comparatively short, moderately robust, very slightly curved, and not much tapered toward the tip. The spinous rows are also very closely placed. One of the larger examples is sketched in Pl. LXIX. fig. 2. In the smaller forms next the body the spinous rows are somewhat wider. The ventral division has boldly bifid bristles superiorly (Pl. LXIX. fig. 3), the whole tip being rather broad, and the spinous region short. The secondary process at the tip diminishes in length from the superior to the inferior series; thus in the latter

[1] Named after Dr. Kenneth Macleod, of H.M. Indian Army, who aided me in dredging at Paible, North Uist, in 1865.

it scarcely reaches halfway to the tip of the peculiarly curved terminal hook. The bristles throughout are faintly yellowish.

This differs from *Parmenis ljungmani* in the proportional strength and structure of the dorsal bristles, and in the pale semitranslucent condition of the scales; but the ventral bristles approach each other closely.

Harmothoë antilopes, n. s. First procured in 1865, at Lochmaddy, North Uist, and off the Hebrides, as well as frequently in the 'Porcupine' Expeditions.

Body moderately elongated, from three quarters to nearly an inch. Bristle-bearing segments about thirty-six. Head with the anterior angles characteristically truncated. Two comparatively large and somewhat widely separated eyes occur near the posterior border. In good preparations the anterior pair are not visible from the dorsum, as they occupy a position immediately beneath the truncated anterior angles of the snout. Median tentacle moderately long, slightly enlarged below the filiform tip (in spirit), and covered with clavate papillæ. The latter also occur on the antennæ, which are small and subulate, and lie beneath the level of the former. The palpi have minute papillæ, which toward the termination are dilated and then constricted below the slightly warty tip. The tentacular cirri are somewhat enlarged below the extremity, and covered with long cilia having bulbous tips. Moreover these organs are continued a considerable way (about one third) on the filiform termination above the enlargement. The dorsal cirri, again, resemble the latter; and their cilia reach within a short distance of the tip—a rather unusual arrangement. The ventral cirri are slightly enlarged at the base, have sparsely distributed short papillæ; and the tips of the organs reach the exit of the nearest bristles.

Only one specimen had scales, which seem to amount to fourteen or fifteen pairs. All are fringed, chiefly along the outer border, with long filiform cilia with somewhat enlarged tips. The papillæ on the surface are large and boldly marked, the dilated tips being formed of blunt processes or spines. A slight brownish coloration occurs on the dorsal surface where they touch each other; but the rest of the scale is pale, except from the minute brownish spines of the papillæ.

The dorsal branch of the foot carries a series of conspicuously long and strong bristles, most distinctly marked by transverse spinous rows at rather wide intervals (whence the name of the species, from the resemblance of these organs to the horns of certain Antelopes, such as *Hippotragus oryx*). Those next the ventral series are long and nearly straight, while the inner are shorter and distinctly curved. One of the larger is represented in Pl. LXIX. fig. 4. The bristle tapers much distally; and by careful adjustment the spinous rows on the opposite side are brought out, as at *ac*. Such a bristle, of course, is not round, but conspicuously angled, apparently broad posteriorly and thinned, with a curve to the edge. The ventral bristles, again, are rather short and fine, commencing superiorly with a series having a long tapering

and delicate spinous region with a bifid and scarcely curved tip, careful examination being necessary to detect the slender secondary process (Pl. LXIX. fig. 5). The tips become stouter though shorter inferiorly, and the bifid extremity more apparent, the secondary process proceeding halfway upward in the stronger forms. This process becomes a mere speck and finally disappears in the lowest bristles. One of the stoutest forms (three or four of which spring from the region of the spine) is drawn in Pl. LXIX. fig. 6. The spinous region has its upper third even narrower than that immediately behind the hook at the tip—a peculiarity not often seen.

Harmothoë haliaëti[1], n. s. Dredged in the Minch by Dr. Gwyn Jeffreys. A fragment of the posterior end of the worm was obtained; and the feet are the only parts that can be described at present. It is a species of some size.

The dorsal branch of the foot bears a series of rather slender slightly curved bristles with conspicuous rows of spines (Pl. LXIX. fig. 7). Such bristles, when viewed antero-posteriorly, present a much narrower aspect than when seen in profile. The arrangement of the spinous rows is alternate, as in the ventral bristles. The superior ventral bristles have elongate spinous portions and slender tips (Pl. LXIX. fig. 8). At first the bifid tips are almost straight or very slightly curved, but they soon become more characteristic (fig. 9). The alternate rows of prominent spines are conspicuous in both figures. The *facies* of the tip is even more characteristic in the inferior series (Pl. LXIX. fig. 10). In the superior group the secondary process is nearly straight; but in the others it bends outward at the tip.

The inferior cirrus is slightly enlarged at the base, slender and filiform superiorly, and furnished with rather long papillæ, sparsely distributed.

The species is at once distinguished from *Polynoë floccosa* by the structure of the bristles, both dorsal and ventral, and by the presence of rather long papillæ on the ventral cirrus.

Harmothoë marphysæ, n. s. From the galleries of *Marphysa sanguinea* in Guernsey, and chinks of the rocks, Polperro (Brit. Mus.).

Length about three quarters of an inch. Bristle-bearing segments thirty-one; but the posterior region is in process of reproduction. Of a pale brownish hue, inclining to buff, with a red patch on the head and a purplish one (due to the proboscis) behind; a faint median line from end to end; cirri pale brownish, pellucid, the two caudal styles being darkest. The under surface is pinkish, with a broad streak of pale carmine in the centre.

The head is rather elongated from before backward, and rounded in front. Eyes small; the anterior pair widest apart and situated in front of the middle line at the edge of the red patch on the head. The posterior pair lie in front of the posterior

[1] Named after Dr. Gwyn Jeffrey's yacht 'Osprey.'

border, and behind the red patch. The tentacle is absent. The antennæ are short, with filiform tips, and furnished with a few clavate papillæ. The palpi are short and stout with delicately tapered extremities. The tentacular cirri taper to a fine point, and have a few sparsely distributed clavate papillæ. The dorsal cirri are similar to the latter, and have no trace of any swelling below the tip. The ventral cirri have a few short papillæ, and do not extend beyond the fleshy portion of the foot.

The scales in the specimen are fourteen pairs, smooth and pellucid, the anterior only having a faint brownish patch on a whitish portion. Under a power of 350 diam. minute and widely separated papillæ occur in the usual positions. Few or none appear on the edge of the scale. They are rounded in front, reniform, or even somewhat quadrate posteriorly.

The dorsal bristles are very slender, and much more delicate than in *Malmgrenia castanea*. Only a few of their tips project beyond the skin. One of the longer is shown in Pl. LXIX. fig. 11, and one of the shorter and stouter in Pl. LXX. fig. 18. The ventral bristles have long shafts and comparatively short terminal portions. The superior examples present a simple termination (Pl. LXIX. fig. 12), while a distinct secondary process is observed in the succeeding forms (figs. 13, 14, the latter being seen from the front). Toward the ventral edge of the group the tips are again simple (fig. 15).

In this species the body is moderately and the head peculiarly elongated. The feet are long and prominent, and the ventral tubercle at their base very distinctly marked. They become decidedly larger about the fourteenth or fifteenth segment; but whether this is due to abnormality or otherwise is unknown. After nine longer pairs the rest (posteriorly) are shorter. When the animal was placed in an open vessel beside *Marphysa sanguinea* it clung to the body of the latter near the head.

Closely allied to the foregoing is HARMOTHOË LUNULATA, Delle Chiaje, a form very generally distributed throughout British waters, from Shetland to the Channel Islands, and from the west coast of Ireland to the east coast of Scotland. Dr. Carrington, of Eccles, first found it in this country, in company with *Acholoë astericola*, D. Ch., on *Astropecten irregularis* tossed on Southport sands.

The head resembles that of *H. marphysæ*; only the eyes are somewhat larger, and the head less elongated. The tentacle terminates in a filiform tip, and has sparsely distributed clavate papillæ. The antennæ and tentacular cirri have the same shape and papillæ. The palpi are smooth. The dorsal cirri taper to a fine point, and have well-marked clavate papillæ sparsely distributed. The ventral cirri also have the same processes, and reach considerably beyond the bases of the nearest bristles.

The scales are fifteen pairs (not twelve as stated by Dr. Carrington). In some of the Zetlandic examples they are faintly tinged with brown toward the posterior border; in others each scale has a brownish ring, or the brown pigment forms a bold border for the inner (exposed) third, and sends a process (in some cases enlarged near

the termination) toward the centre of the scale, so as to indicate a V. In the forms from St. Andrews the pigment assumes the shape of the shell of *Pandora*, with a spot corresponding to the hinge anteriorly. They are as smooth as in *H. marphysæ*, only a few small papillæ occurring on the surface.

The dorsal bristles are somewhat longer than in *H. marphysæ* (Pl. LXIX. fig. 16—in profile, and in fig. 17 antero-posteriorly, so as to show the usual alternate disposition of the rows of spikes, the specimens in both cases representing the longer forms next the ventral). One of the shorter bristles next the body is shown in Pl. LXIX. fig. 18. The ventral branch has superiorly a long series, having at the tip a secondary process separated only by a narrow fissure (Pl. LXIX. fig. 19). The fissure becomes more evident as the distal part decreases in length, but it again is less distinct ventrally, some at the extreme verge having a very short secondary process. A bristle from the middle of the ventral group is drawn in Pl. LXIX. fig. 20.

The Zetlandic examples are somewhat elongated, and have longer feet, and longer and more delicate pale bristles; moreover the dorsal and ventral cirri are rather longer than in the southern forms. The persistent attachment of the scales is not a feature characteristic of these examples; for they readily fall off. They are in contrast in regard to the former characters with examples from the Channel Islands. As mentioned by Dr. Carrington, the majority show inferiorly a series of brown spots, which commence as four rows rather behind the middle. In some the sets are united so as to form two rows of bars at the junction of each segment; this junction sometimes occurs posteriorly, even when there are four rows in front. It is a very active species amongst the Laminarian roots, and displays as much irritability as *Evarne impar*. It sometimes lives in the tube of *Polycirrus*. The colours are for the most part retained after immersion in spirit; but the animal often breaks into pieces. It is brightly phosphorescent, glowing, when irritated, at the bases of the feet for a considerable time, and giving off flashes when immersed in spirit.

It will be observed that the species approaches *H. marphysæ* very closely, though the cirri of the latter are shorter and smoother, the bristles of the dorsal branch much shorter and less conspicuous, and those of the ventral shorter and more slender; moreover those of the superior ventral series have no bifurcation at the tip, the closest approach to the latter condition being in a variety of *H. lunulata* from St. Peter Port, Guernsey, which had an indistinctly bifid tip in one or two of its superior bristles. Such is unusual. I have united it with Delle Chiaje's form[1], especially on carefully considering the further descriptions of M. Claparède[2], whose figures, however, are not very characteristic.

Evarne impar, Johnst. This species is generally distributed throughout the British

[1] Descrizione e not. pl. 144. f. 5, 6, and vol. v. pp. 56, 57.

[2] Annél. Chét. du Golfe de Naples, p. 63, pl. 2. f. 1.

area. The aspect of the dorsum is greenish brown. The tentacle is madder brown. The fifteen pairs of scales have brownish pigment toward the inner edge; and in the centre of each is often a yellowish speck, best marked posteriorly. The cirri are very finely tapered. The dorsal branch of the foot bears a series of bristles with very distinct spinous rows (Pl. LXX. fig. 1), with a short tip, the ventral edge showing a differentiation as in the figure, which represents one of the stouter examples; the more slender forms have the spinous rows even more widely separated. The ventral division has superiorly bristles with long bifid tips (Pl. LXX. fig. 2), the latter, as usual, becoming shorter and stouter in the inferior series (as in fig. 3—from the middle of the tuft). A few at the ventral edge have simple tips, without the secondary process. In a large example from Herm the tubercles on the scales are most conspicuous clavate organs, very much more developed than Malmgren shows; they are pyriform, with tubercles on the summit. A large specimen, again, dredged by Dr. Gwyn Jeffreys off Valentia had no tubercles on the scales. There is, indeed, considerable variation; for some of those from Herm have shorter cilia on the scales with more distinctly globular heads, and the dorsal bristles are smaller. The entire animal has a rougher aspect than *H. imbricata*, and is much more lively and active, as well as more irritable, frequently breaking in pieces if molested. It is a graceful species from its taper form and the long caudal styles. The *Polynoë reticulata* of Claparède[1] is in all probability this form; and the *Polynoë spinifera* of Ehlers is closely allied.

Lænilla setosissima, Savigny[2]. This would appear to the *Polynoë longisetis* of Grube[3] (and, as such, mentioned in the Trans. R. Soc. Edin. vol. xxv. pt. ii. p. 408, pl. 15. fig. 3), the *Harmothoë malmgreni*, E. R. Lankester, and the *Lænilla glabra*, Malmgren[4]. The *P. lævigata* of Claparède[5] is probably the same form. It occurs generally round the British shores. The ventral bristles are sufficiently characteristic when contrasted with those of *H. imbricata*. The dorsal are also much longer, have closer rows of spines, and a differently formed smooth tip. Savigny indicates most of the characters, such as the much larger anterior eyes and the light golden bristles; and M. de Quatrefages makes the diagnosis more evident by finding bifid inferior bristles in a large specimen.

Antinoë finmarchica, Mgrn. Dredged off the west coast of Ireland in the 'Porcupine' Expedition of 1869.

Hermadion assimile, n. s. First found at St. Andrews, afterwards on the west coast of Ireland, south of England, and off the Spanish coast in the 'Porcupine' Expedition.

[1] Supplément, Annél. Chét. Nap. p. 10, pl. 1. f. 1.
[2] Syst. des Annélides, p. 25.
[3] Archiv f. Naturges. xxix. p. 37, taf. 4. f. 1, 1863.
[4] Annulat. Polychæt. &c. p. 12.
[5] Supplém. Annél. Chét. p. 14, pl. 1. f. 3.

The species seems to be somewhat elongated (three quarters of an inch), those hitherto observed being easily discriminated in spirit by a brownish black band which commences behind the head, and continues along the centre to the posterior end. It is widest over the œsophageal region, and has a separate line (interruption) at each segment.

The head has a similar structure to that of *Hermadion pellucidum*, Ehlers (formerly described as British[1]), the eyes being placed close together on each side, while they are wide apart transversely; the anterior pair appear to have "lenses"—that is, show a whitish centre. The tentacle is long, smooth, dilated below the filiform terminal appendage, and minutely dotted under a low power. The antennæ are short and slightly enlarged below the long filiform tip. The palpi are quite smooth. The tentacular and dorsal cirri are also smooth, and slightly enlarged below the filiform extremity; they are much shorter than those of *H. pellucidum*. The ventral cirri, again, are rather slender, quite smooth, and reach about the tip of the fleshy part of the foot. The scales are very delicate and translucent, and show minute rounded papillæ, sparsely placed on their exterior border and neighbouring surface.

The dorsal bristles are translucent and somewhat smaller than in *H. pellucidum*, the spinous rows toward the tip being much less prominent, and covering a shorter region of the bristles; moreover the tip is more rounded than in *H. pellucidum*, and the notch is distal rather than lateral. One of the longer forms is represented in Pl. LXX. fig. 4, and one of the shorter (which exhibits the spinous rows more clearly) in fig. 5. The ventral bristles are also translucent, with the terminal portion gently narrowed from the basal collar of spines upward (Pl. LXX. fig. 6). The tip, which is more obtuse than in *H. pellucidum*, turns bluntly round toward the spiked side, and ends in a small beak; then an oblique edge occurs between this and the secondary process, which is lateral. The whole characteristically differs from *H. pellucidum*.

Halosydna gelatinosa, Sars. Generally distributed from Shetland to the Channel Islands. The bristles are figured in Trans. R. S. Edin. vol. xxv. pl. 15. f. 6.

Enipo kinbergi, Mgrn.? Fragmentary and half-digested specimens of a very elongated form are not uncommon in the stomachs of cod and haddock caught off St. Andrews Bay. The condition of these forbids a minute account. Only one had a dilapidated head; and in this no eyes remained. The largest fragment had upward of fifty segments, and it was far from being complete. The dorsal cirri are quite smooth. The feet, like those of *E. kinbergi*, are prominent; and if, as I am disposed to think, the species is to be referred to the latter, Malmgren's figures require improvement. The dorsal bristles are very minute, slender hairs, finely serrated (Pl. LXX. fig. 7). The ventral are of two kinds, viz.:—that indicated by Malmgren, and correctly

[1] Trans. R. S. Edin. vol. xxv. p. 408, pl. xv. f. 2, *a*, *b*.

represented in fig. 8 (the serrations in all our examples are apparently less numerous and wider apart than shown by Malmgren's artist); and, secondly, a few with characteristically curved tip and secondary process beneath (fig. 9). The rows of spines or serrations are not opposite, but alternate, as shown in fig. 10, which is a drawing of a larger form than the latter. There is a slight enlargement of the shaft beneath the spinous portion.

Polynoë scolopendrina, Sav. Occurs at various points, both east and west, from Shetland to the Channel Islands, and generally in the tubes of *Terebella nebulosa*. The finest specimens come from the Outer Hebrides. The dorsal branch of the foot bears a small tuft of spinous bristles with curiously dilated and peculiarly wrinkled tips, but often so covered with extraneous growths that their structure is difficult to determine. When the foot is pressed between glasses the tips of this series just reach the bases of the ventral bristles. The latter consist superiorly of one or two stout, simple bristles, much stronger than the succeeding, and with short spinous rows; the rest have short serrated portions and boldly bifid tips. The presence of the first series renders generic distinction necessary. At the posterior part of the body only one of this kind occurs in each foot. The dorsal cirrus is almost subulate, with short clavate papillæ slightly dilated at the tip. The ventral cirrus has similar appendages. Malmgren's figures of the bristles are imperfect.

Acholoë astericola, Delle Chiaje. This species appears to have been first clearly distinguished as British by Dr. Carrington (his *Polynoë asterinæ*), who found it at Southport on *Astropecten irregularis*; and I am indebted to him for my specimens. Dr. E. Perceval Wright likewise procured it at Galway. It is easily discriminated by its comparative length, and the large number and coloration of the scales. The dorsal cirrus tapers from base to apex, and has a very few short papillæ. The ventral cirrus appears to be smooth. The bristles of the dorsal branch are minute, and a limited portion in the specimens projects beyond the surface (Pl. LXX. fig. 11). The ventral bristles are furnished with long shafts, a well-marked hook at the tip; and although there are spines on the concave surface, no larger processes occur at the base of the rows as in allied forms (Pl. LXX. fig. 12). M. Claparède[1] gives a very fair account of the species, which he found in company with *Stephania flexuosa* on "*Astropecten aurantiacus*" in the Bay of Naples.

ACOËTIDÆ.

The only representative of this family found in British waters is *Panthalis ærstedi*, Kbg., which was dredged by Dr. Gwyn Jeffreys in 75 fathoms, thirty-five miles off the Skerries, Shetland. It is a large species, distinguished by the massive body, the

[1] Supplém. Annél. Chét. Nap. p. 18, pl. 2. fig. 1.

apparent absence of eyes in the spirit-preparations, and the large smooth scales. Kinberg, however, states that the eyes are on the peduncles. The feet are uniramous, with short ventral and dorsal cirri. Superiorly there is a series of long brush-shaped bristles with tufted tips; next, the characteristic strong bristles with the brush on one side, and with a pencil-like crest at the tip; while inferiorly are elongate subulate bristles, which are boldly serrated at the commencement of the terminal region, then gradually taper to a finely serrated extremity. With the first or brush-like series are many short and apparently simple bristles. They project only a short distance, and do not seem to have been noticed by Kinberg, who, however, mentions a similar kind in *Eupompe*. The structure of the terminal whip of the strong bristles is somewhat indistinctly represented by the latter author, since it is a true prolongation of the shaft with lateral setæ.

SIGALIONIDÆ.

A single species of *Sthenelais* (*S. boa*, Johnst.) and *Pholoë minuta*, Fabr., are the only representatives of the family mentioned in the Catalogue of the British Museum. To these *Sthenalais limicola*, Ehlers (a scale of which is represented in Pl. LXX. fig. 13), *Sigalion mathildæ*, Aud. & Ed., and *S. buskii*, M'I., have since been added. The present notice further extends the list.

STHENELAIS BOA, Johnst., is a species widely distributed from Shetland to the Channel Islands; and the *S. idunæ*, H. Rathke, is, in all probability, referable to the same animal.

S.? ZETLANDICA, n. s. A fragmentary form dredged by Dr. Jeffreys in Shetland. The anterior region is injured, and the head absent, though the proboscis is present. The scales are somewhat reniform, irregularly rounded anteriorly, and densely covered with flat papillæ over the whole surface; on the folded edge of the scale they form low, smooth warts, larger in proportion than those in *S. boa* (Pl. LXX. fig. 15). The outer edge, again, bears a somewhat closely arranged series of short clavate papillæ, almost globular at the commencement, and with minute processes or palpocils on the summit.

The superior lobe of the foot has numerous and rather small papillæ, which end rather bluntly, the tip being provided with several secondary papillæ. The superior bristles are well developed, and have their rows of spines very distinctly marked. The divisions of the inferior lobe are somewhat indistinct; but all are furnished with the small papillæ having the secondary processes or warts at the tip. There is a well-marked group of the latter just at the ventral margin where the inferior group of bristles emerges. The superior ventral bristles (Pl. LXX. fig. 16—in chloride of calcium, and with the basal part of the terminal process slightly folded) are strong, with four or five

rows of spines at the tip of the shaft, visible, however, only at the edge. The terminal portion consists of two divisions—a long basal, and a terminal portion only about one fifth the length of the basal. The claw at the tip is distinct and much curved; and the secondary process beneath is apparently separate, just touching the former at the tip. The next, inferior group of bristles are less robust, but have only two divisions in the terminal portion. The more slender ventral series, again, have three divisions in the distal region (Pl. LXX. fig. 17, which represents one of the larger forms). The bristles throughout are tinged of a light brownish hue. The ventral cirrus is slender and does not reach the tip of the fleshy part of the foot. There is a series of globular warts or papillæ along the ventral margin of the foot, and apparently three ciliated processes beneath the branchiæ on the dorsum.

Sigalion buskii, M'I. In the 'Transactions' of the Royal Society of Edinburgh I was inclined to unite this form with the *Sthenelais dendrolepis* of Claparède; but a more careful consideration of all the facts has caused me to revert to the name originally given. The species is of some size, and stouter than *S. mathildæ*.

The head is pale, no eye-specks being visible in the preparation. The scales anteriorly are somewhat quadrate, with the inner edge rounded. Remarkable pinnate processes (Trans. R. S. E. vol. xxv. pl. 12. f. 12) occur on the outer edge (Pl. LXX. fig. 14), and are quite visible under a lens. Instead of the hyaline cylindrical processes of *S. mathildæ*, this form has lanceolate and granular pinnæ with narrow tips. They likewise differ from the arborescent papillæ of Claparède's *S. dendrolepis*.

The superior lobe of the foot (which is somewhat spathulate in lateral views) has very long and, superiorly, boldly serrated bristles, the inferior (in ordinary views) being much shorter and more delicate. The former show a bare portion of the shaft at the base. The superior series of the ventral lobe are simple serrated bristles with a fine tip. Those next resemble that figured in the Trans. R. S. E. pl. 15. fig. 5, though in some cases there are eighteen rows of spines, which, as shown in the figure, and as noticed by Claparède, are arranged in a spiral or whorled manner, some much resembling the stalk of *Equisetum*. The jointed tips of these have from five to ten divisions, and finely tapered and minutely bifid extremities. Below these are a few represented by fig. 4 in the same plate, the terminal process consisting of about eleven segments, and being rather distinctly bifid at the tip. Others have more delicate shafts with a few serrations at the end, and a shorter terminal portion of six or seven segments. One or two below the papillæ for the spine have stout shafts only faintly crenated at the distal end, and a terminal process of one or two segments with a characteristic claw. The inferior bristles have slender shafts with two or three serrations at the end, and terminal processes of eight or nine divisions ending in rather deeply bifid tips. The inferior cirrus is slender and long, reaching beyond the tip of the foot. Three ciliated pads occur on the curve below the branchial process. Anteriorly a single papilla, as a rule,

is found on the superior lobe of the foot. Those on the posterior feet are ramose, like the growing antlers of the Stag.

The *Pholoë inornata* and *P. eximia* of the British-Museum Catalogue refer to the same species, viz. *P. minuta*, Fabr. I doubt, also, if the *P. synophthalmica* of Claparède[1] is other than a mere variety.

DESCRIPTION OF THE PLATES.

PLATE LXVII.

Fig. 1. Ventral bristle of *Spinther oniscoides*, Johnst. Magnified 90 diameters.
Fig. 2. The tip of a somewhat stouter and shorter form. Magn. 350 diam.
Fig. 3. Hook from ventral cirrus. Magn. 350 diam.
Fig. 4. Dorsal bristle of *Eunoa nodosa*, Sars, from the specimen recognized by Malmgren in the British Museum. Magn. 210 diam.
Fig. 5. Ventral bristle of the same specimen in balsam. Magn. 210 diam.
Fig. 6. Ventral bristle mounted in water. Magn. 210 diam.
Fig. 7. Dorsal bristle of a specimen of the same species from the coast of Durham. Magn. 210 diam.
Fig. 8. Ventral bristle of the same. Magn. 210 diam.
Fig. 9. Tip of a dorsal bristle of *Dasylepis asperrima*, Sars. Magn. 210 diam.
Figs. 10, 11. Tips of ventral bristles. Magn. 350 diam.
Fig. 12. One of the longer dorsal bristles of *Lagisca propinqua*, Malmgren. Magn. 350 diam.
Fig. 13. Superior ventral bristle. Magn. 350 diam.
Fig. 14. Inferior ventral bristle. Magn. 350 diam.
Fig. 15. Dorsal bristle of *Malmgrenia castanea*, n. s. Magn. 350 diam.
Fig. 16. Superior ventral bristle. Magn. 350 diam.
Fig. 17. Inferior ventral bristle. Magn. 350 diam.
Fig. 18. Tip of a ventral bristle of the same species from Valentia, showing the process beneath the hook. Magn. 350 diam.
Fig. 19. Another example, from the west coast of Ireland, with a very evident secondary process at the tip. Magn. 350 diam.
Fig. 20. One of the larger dorsal bristles of *Malmgrenia andreapolis*, n. s. Magn. 700 diam.
Fig. 21. Superior ventral bristle. Magn. 350 diam.
Fig. 22. Median ventral bristle. Magn. 700 diam.
Fig. 23. Inferior ventral bristle. Magn. 700 diam.

[1] Annél. Chét. Nap. p. 79, pl. 3. f. 1.

PLATE LXVIII.

Fig. 1. Dorsal bristle of *Harmothoë sibbaldii*, n. s. Magn. 350 diam.
Fig. 2. Superior ventral bristle. Magn. 350 diam.
Fig. 3. Inferior ventral bristle. Magn. 350 diam.
Fig. 4. Front view of a dorsal bristle of *H. zetlandica*, n. s. Magn. 210 diam.
Fig. 5. Superior ventral bristle. Magn. 350 diam.
Fig. 6. Tip of one of the longer dorsal bristles of *Polynoë floccosa*, Sav. Magn. 350 diam.
Fig. 7. Tip of a dorsal bristle from a large specimen of *H. imbricata*. Magn. 350 diam.
Fig. 8. Superior ventral bristle of *P. floccosa*. Magn. 350 diam.
Fig. 9. Superior ventral bristle of *H. imbricata*. Magn. 350 diam.
Fig. 10. Median ventral bristle of *P. floccosa*. Magn. 350 diam.
Fig. 11. Median ventral bristle of *H. imbricata*. Magn. 350 diam.
Fig. 12. Tip of a dorsal bristle of *H. areolata*, Grube. Magn. 350 diam.
Fig. 13. Superior ventral bristle. Magn. 350 diam.
Fig. 14. One of the most characteristic median ventral bristles. Magn. 350 diam.
Fig. 15. Tip of a developing bristle of *Malmgrenia castanea*, n. s., showing the secondary process at the end of the spinous rows. Magn. 350 diam.

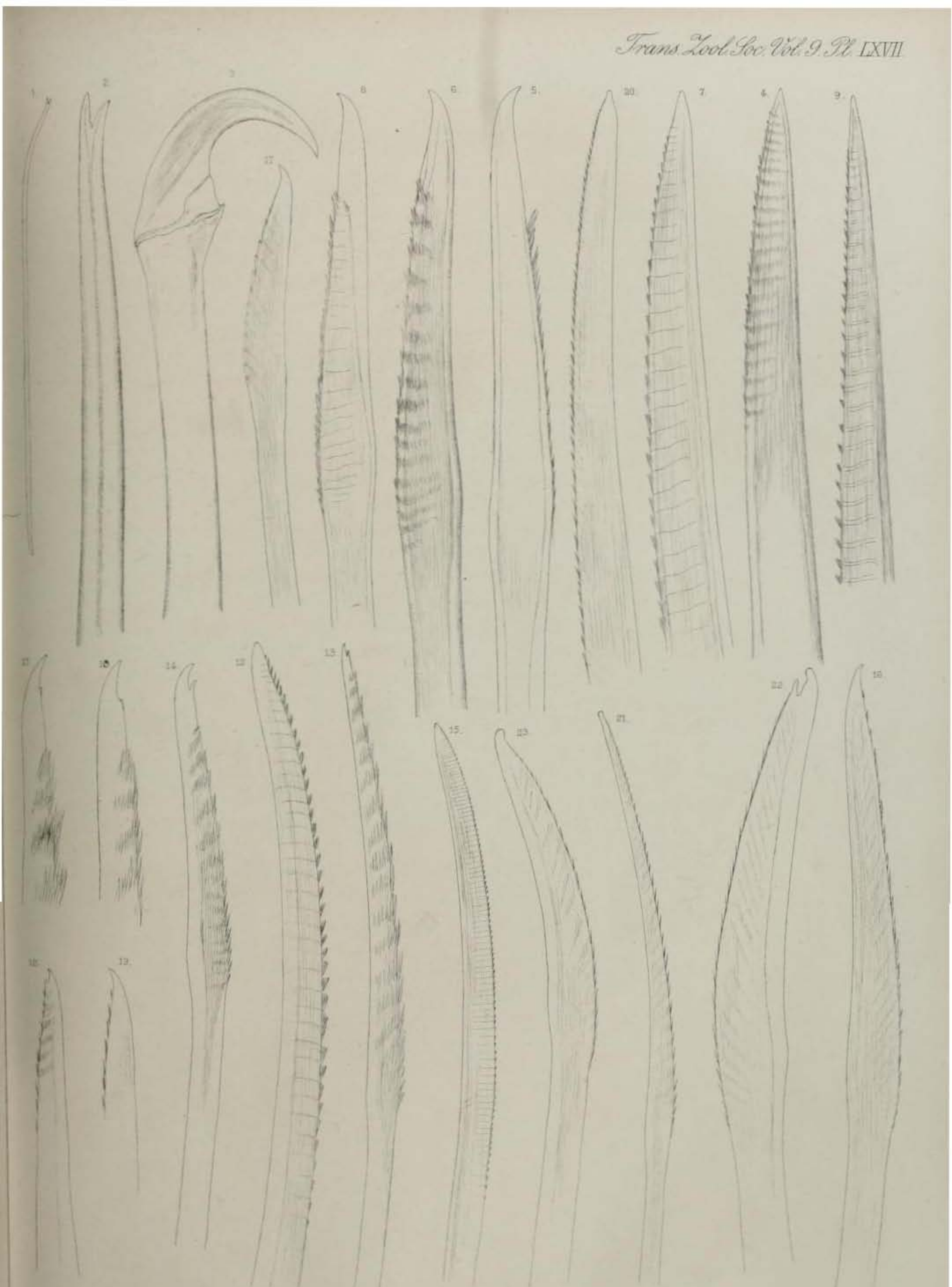
PLATE LXIX.

Fig. 1. Dorsal bristle of *Harmothoë zetlandica*, n. s. Magn. 350 diam.
Fig. 2. Dorsal bristle of *H. macleodi*, n. s. Magn. 350 diam.
Fig. 3. Superior ventral bristle. Magn. 350 diam.
Fig. 4. One of the larger dorsal bristles of *H. antilopes*, n. s. Magn. 350 diam.
Fig. 5. Superior ventral bristle. Magn. 350 diam.
Fig. 6. One of the stouter forms from the neighbourhood of the spine. Magn. 350 diam.
Fig. 7. Dorsal bristle of *H. haliæeti*, n. s. Magn. 350 diam.
Fig. 8. Superior ventral bristle, viewed antero-posteriorly. Magn. 350 diam.
Fig. 9. Another superior ventral bristle, seen laterally. Magn. 350 diam.
Fig. 10. Inferior ventral bristle. Magn. 350 diam.
Fig. 11. One of the longer dorsal bristles of *H. marphysæ*, n. s. Magn. 350 diam.
Fig. 12. Superior ventral bristle. Magn. 350 diam.
Fig. 13. Median ventral bristle, viewed laterally. Magn. 350 diam.
Fig. 14. Antero-posterior view of a median ventral bristle. Magn. 350 diam.
Fig. 15. Inferior ventral bristle. Magn. 350 diam.
Fig. 16. Profile of one of the longer dorsal bristles of *H. lunulata*, Delle Chiaje. Magn. 350 diam.
Fig. 17. Antero-posterior view of another dorsal bristle. Magn. 350 diam.
Fig. 18. One of the shorter dorsal bristles. Magn. 350 diam.

Fig. 19. Superior ventral bristle. Magn. 350 diam.
Fig. 20. Median ventral bristle. Magn. 350 diam.

PLATE LXX.

Fig. 1. One of the stouter dorsal bristles from a large specimen of *Evarne impar* from Herm. Magn. 350 diam.
Fig. 2. Superior ventral bristle. Magn. 350 diam.
Fig. 3. Lower median ventral bristle. Magn. 350 diam.
Fig. 4. One of the longer dorsal bristles of *Hermadion assimile*, n. s. Magn. 350 diam.
Fig. 5. One of the shorter dorsal bristles. Magn. 350 diam.
Fig. 6. Ventral bristle. Magn. 350 diam.
Fig. 7. Dorsal bristle of *Enipo kinbergi*, Mgrn. ? Magn. 350 diam.
Fig. 8. Ventral bristle with simple tip. Magn. 350 diam.
Fig. 9. Bifid ventral bristle. Magn. 350 diam.
Fig. 10. Ventral bristle (a large form with simple tip) viewed antero-posteriorly. Magn. 350 diam.
Fig. 11. Dorsal bristle of *Acholoë astericola*, Delle Chiaje. Magn. 350 diam.
Fig. 12. Ventral bristle. Magn. 350 diam.
Fig. 13. Anterior scale of *Sthenelais limicola*, Ehlers. Magn. 40 diam.
Fig. 14. Scale of *Sigalion buskii*, n. s. Enlarged.
Fig. 15. Portion of the edge of a scale of *Sthenelais ? zetlandica*. Magn. 350 diam.
Fig. 16. Superior ventral bristle in chloride of calcium. Magn. 350 diam.
Fig. 17. Inferior ventral bristle. Magn. 350 diam.



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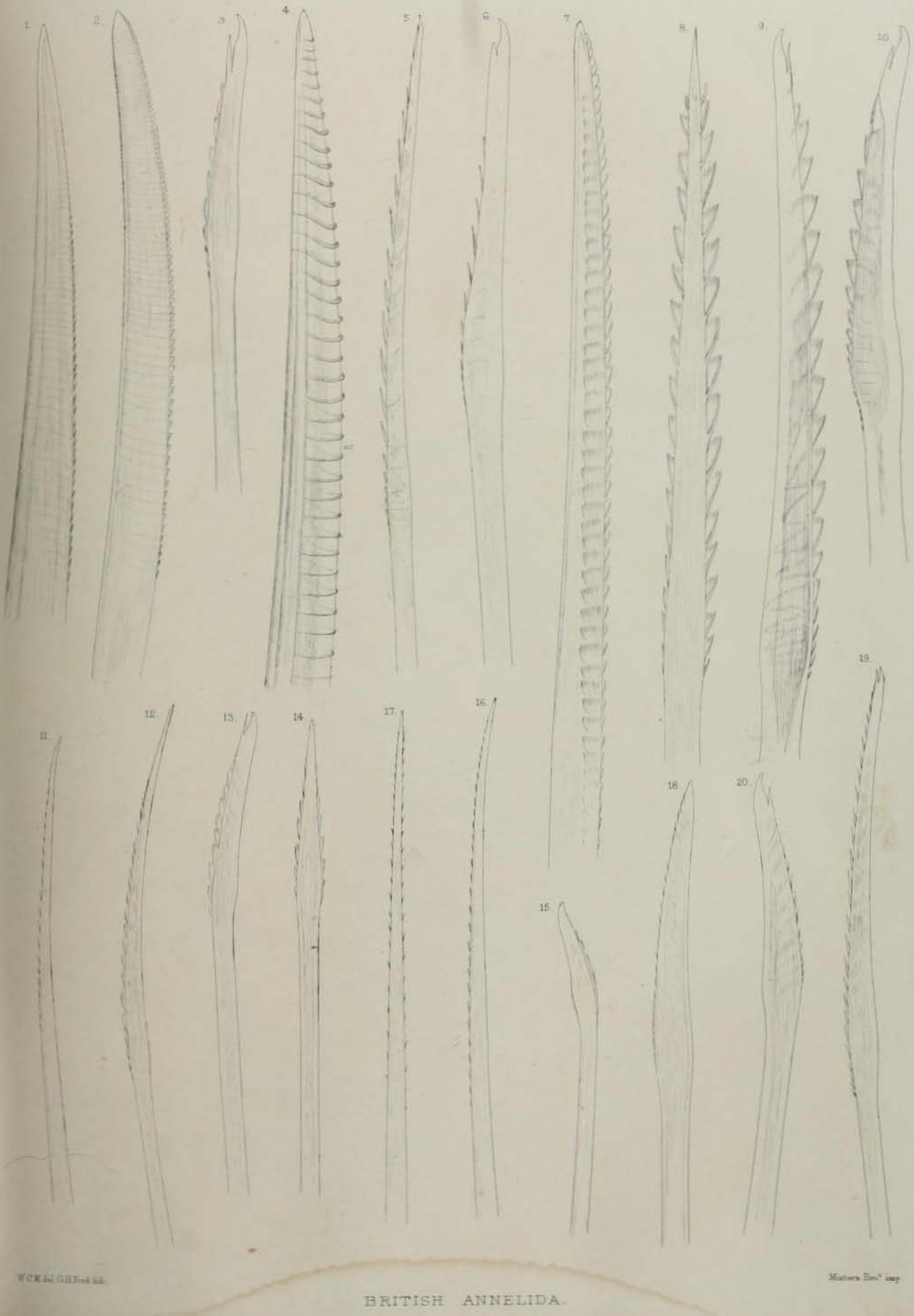
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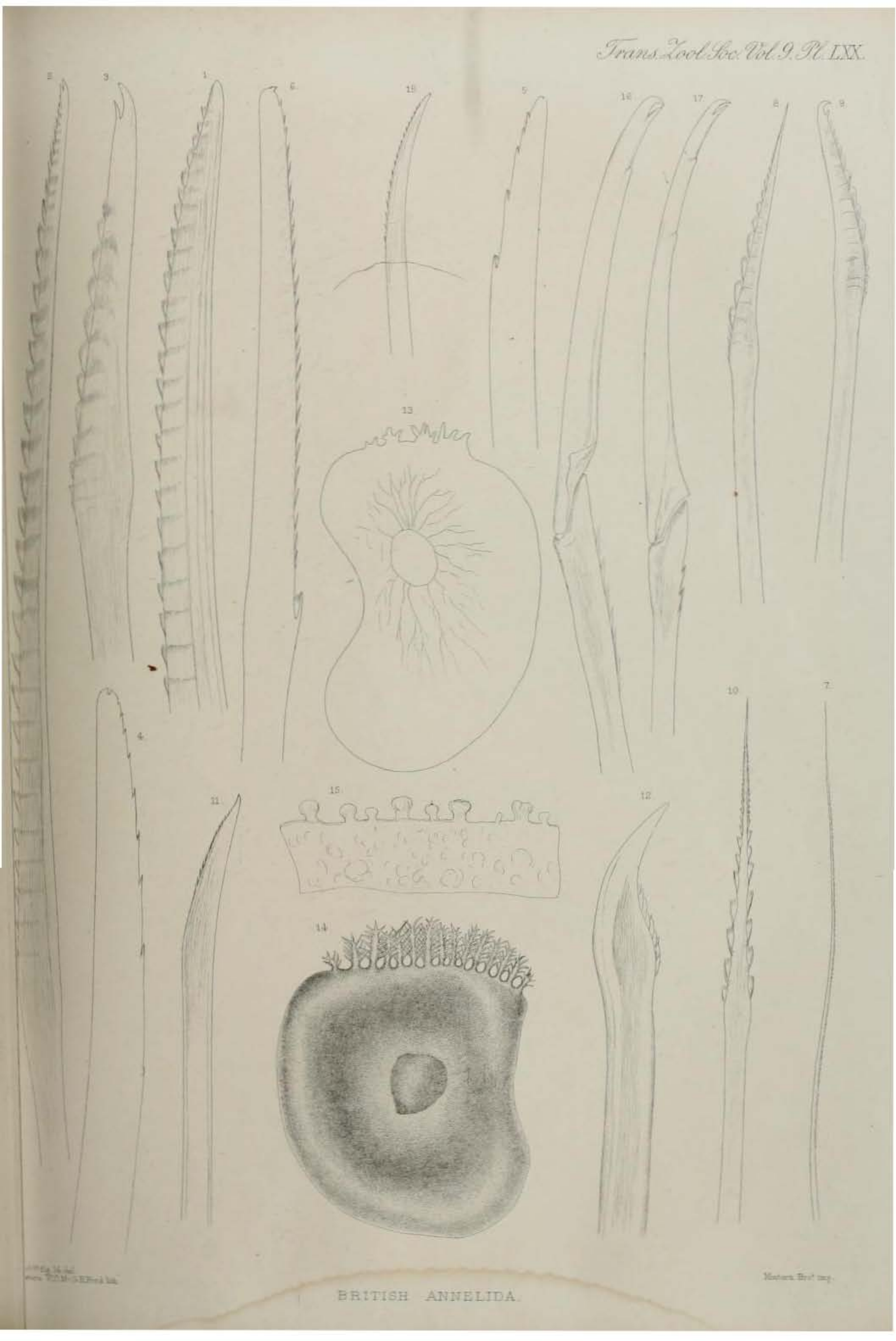

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