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LXII.—*Notes from the Gatty Marine Laboratory, St. Andrews.*—No. XXIX. By Prof. M'INTOSH, M.D., LL.D., F.R.S., &c.

[Plate XVII.]

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1. *On a Tumour in a Plaice.*

On the 13th November, 1907, a fisherman (James Gourlay) brought a plaice about $10\frac{1}{2}$ inches in length and normal in coloration which presented on the right side above the lateral line an elongated elastic swelling. The tumour was somewhat irregularly elevated, and at first sight it resembled, from the irregular prominences, the condition resulting from an injured or diseased spine. On the left or white surface the tumour was more uniformly elevated, forming an elongate-ovoid mass $3\frac{1}{4}$ inches in its long or antero-posterior diameter, and $1\frac{7}{8}$ inch in its transverse at the widest part, which was median. It was slightly narrowed at each end and of the same soft elastic nature as on the dorsum. On

section the tumour appeared to be more or less gelatinous, a pale fluid and blood escaping, and it was easily pierced by a blunt knife. It had hollowed out for itself an elongated cavity on the left side, extending over at least 20 neural spines, from 12 to 14 of which were distinctly curved, and this was deepest in front, where the densest part of the mass was, and moreover showed signs of degeneration with effusion of blood. The spines in this area had an unusually distinct convexity to the right. The upward (to the right) pressure of the tumour had by-and-by caused a portion to protrude between two neural spines, enlarging the space, and then it had spread over an area corresponding to four neural spines. The soft gelatinous nature of the tumour appeared to make the passage easy, and no affection of the bony tissues occurred. The tumour could be enucleated from the cavity, though muscular fibres and connective tissue slightly adhered to its capsule. Microscopically * the mass consisted of a vast number of small areolæ, with intervening small cells, apparently rapidly proliferating, the whole richly supplied with minutely ramified blood-vessels. The areolæ varied much in size, and in the sections appeared to be empty, the fluid or semifluid contents probably having escaped, and minute nuclei occurred in their walls. Larger nuclei abounded in the general cellular stroma, with traces of fibrillation. Moreover, larger cavities, surrounded by definite and more deeply stained walls, existed here and there, the contents being a minutely granular and apparently coagulable fluid without nuclei and occasionally with effused blood. Such probably was the gelatinous fluid which exuded on section. Other spaces presented sections of large blood-vessels, but these were less defined than those without blood-vessels and may have been partly caused by manipulation. In certain small areas the blood-vessel was kept *in situ* by bands of tissue radiating from the wall. The minute cells seemed to be in a transparent gelatinous matrix which lent cohesion when portions were separated by dissection, and also gave a streaked or fibroid aspect to the sections.

So far as could be observed the tumour, though apparently of tolerably rapid growth, did not affect the surrounding tissues, since the muscular fibres could readily be separated from its capsule, and there was no affection of the bony structures. The rapid proliferation of the cells appeared to be confined within the capsule, whilst the yielding mass

* I am indebted to Dr. J. R. Tosh for excellent sections variously stained.

pushed the latter before it to the upper (right) side, where expansion was making progress at the time of capture. On the whole it seemed to belong to the group of the myxoma or mucous tissue tumours, the great proportion of cells in its structure giving it the character of a medullary myxoma. Whether eventually it might have shown more harmful characters is conjectural, though its vascularity and the rapid cell-growth gave it a tendency to trouble in this respect. The fish was fairly well nourished and had recently taken food.

2. *On the British Opheliidæ, Scalibregmidæ, and Telethusæ.*

In Dr. Johnston's Catalogue of the Collection in the British Museum the foregoing families are placed under the division Limivora, but it is doubtful if it would be distinctive to consider that in such a form as *Ophelia* the dissimilar rings divided the annelid into head, thorax, and abdomen, or that there was no proboscis.

The most conspicuous representative of the first family is *Ophelia limacina*, H. Rathke, which frequents such sandy bays as that of St. Andrews in numbers, and is tossed on shore in violent storms as an inert reddish-pink worm which exhibits comparatively little motion on irritation, though it is not devoid of hardihood. Almost all the examples thus stranded are adult, so that the habits or habitat of the young would seem to be different, and yet both abound in the stomach of the haddock. The feet are about thirty-four in number, the first ten having the pale iridescent bristles supported by a fillet in front and behind, but at the eleventh foot the posterior fillet is dorsally much enlarged as a lamella behind the bristles, and from it the long, tapering, branchial cirrus extends. The bristles are long, simple, longitudinally striated, and arranged in two tufts, the dorsal considerably longer than the ventral, and both curving outward and backward. The body diminishes abruptly posteriorly and ends in a vent surrounded by about a dozen short cirri, two on the ventral surface being much larger and in life coloured of a deep red hue. The range of this species is wide, viz. from Britain to Norway and Greenland, and, like other annelids, it is a favourite food of fishes.

A small form (which may provisionally be termed *Ophelia rathkei*) dredged by the late Dr. Gwyn Jeffreys in Valentia Harbour apparently adds another species to Britain. The

head is somewhat similar to that of *Ophelia limacina*, the snout being acutely conical, and the mouth forming a transverse slit behind it, as in that species. The enlarged anterior region of the body is longer in proportion to the rest, and there are only about twenty-three bristled segments, instead of thirty-five as in *O. limacina*. The branchiæ are proportionally shorter and do not quite reach the tail. The tail diverges, for it presents only a few blunt cirri dorsally and a rounded median and two short lateral cirri ventrally. When viewed from the rear this region shows a series of short blunt cirri, about nine in number, forming an arch over the large median bluntly rounded papilla on the ventral surface. One of the cirri forming the arch had a slender terminal process or papilla distally, but it is uncertain whether the others had such. The structure of the caudal region thus differs from that of *Ophelia limacina*, and is not a stage in the development of that form, nor does it approach that of *Ophelia neglecta*, Aimé Schneider, or other form. The structure of the foot is similar to that of the species just mentioned, with a shorter branchial cirrus, and beneath it two tufts of simple bristles. The example is a female with large ova in the coelomic cavity in July.

Even more generally distributed than *Ophelia limacina* is the next form, viz. *Ammotrypane aulogaster*, H. R., which ranges along both eastern and western coasts of Britain and extends far north. Instead of the anterior region being devoid of a groove, as in *O. limacina*, in the present form the entire body is deeply grooved ventrally from end to end, and the setigerous region bears a single tuft of simple bristles, a large dorsal cirrus (branchia), and a small ventral cirrus. The anus terminates in a scoop-shaped hood opening ventrally, and with four cirri along each border, a pair of larger and rather thick cirri at its base, and with a slender cirrus between them.

A genus not hitherto known in Britain is *Armandia*, Filippi*, an example of which was dredged amongst sandy mud off one of the small islets in the Sound of Harris in 1872. It has been provisionally termed *A. robertianæ*. In this the head is obtuse and rounded, somewhat like that of *Ammotrypanella arctica*, M'I.†, marked dorsally by a constriction, whilst ventrally the prominent ridges of the ventral longitudinal muscles leave only a small free rim at the snout.

* Arch. per la Zool. l'Anat. e Fisolog. Genova, 1861, vol. i. p. 215.

† Trans. Linn. Soc. 2nd ser. vol. i. p. 505, pl. lxx. fig. 12.

Minute nuchal organs are present on each side just in front of the termination of the lateral groove, but they are only distinct in life. The body is about 14 mm. in length, somewhat short and thick, tapered at each extremity, rounded dorsally and grooved ventrally, the powerful ventral longitudinal muscles forming a conspicuous ridge on each side, almost from end to end. The mouth opens as a small pit behind the isthmus of the longitudinal muscles towards the tip of the snout. The colour of the dorsum is greenish speckled with dark brownish points, a dark central transverse bar occurring at intervals, so as to give the dorsum a segmented appearance. Much of this pigment remains in the spirit-preparation. The ventral surface is pale greenish. The posterior end is abruptly diminished to an upturned caudal process, which is terminated by a slightly oblique border (the slope trending from below upward and forward) furnished with short and somewhat clavate cirri, two being dorsal and two ventral besides two or three lateral, the most conspicuous pair being the ventral. These form a fringe to the anal aperture, which thus opens into a small funnel. The diminished caudal region is marked by closely arranged circular striæ.

In the groove above each ventral ridge of the longitudinal muscles is a series of dark brown pigment-spots (so-called eyes) at regular intervals, but no bristles are visible except in the posterior region, where from five to seven tufts of slender curved glistening bristles form a fringe on each side, sloping downward and backward. Moreover, upon the narrow caudal process a few bristles occur distally on the sides, but their origin is uncertain. The bristles are translucent, taper to a fine point, and do not show evident striations. Small tufts occur considerably in front of those mentioned above, but are only visible under the microscope.

Like its congeners, it is an inhabitant of muddy sand and swims through the water actively like an eel.

Whilst the caudal region somewhat resembles that of De St. Joseph's *Armandia dollfussi* *, it differs in the structure of the head, which in the French species has a slender process (*tentaculaire mince*, De St. Joseph), in the absence of cirri, and in the inconspicuous nature of the bristles.

Another species new to Britain is *Polyophthalmus pictus*, which comes from various parts of the west coast of Ireland, from Kerry to Galway, and is well known on the French and

* Ann. Sc. Nat. 8^e sér. t. xviii, p. 114, pl. vi, figs. 148-151.

other southern coasts. The bluntly rounded head usually in the preparations is devoid of eyes, though three are described by De St. Joseph *, but has well-marked nuchal organs, each of which occasionally projects as a papilla on each side. In some examples the head is paler than the succeeding region and shows a pigment-speck (eye) on each side in front of the brown band at the neck. The body is about an inch in length, rounded dorsally and grooved ventrally, tapered at each end, especially posteriorly, where the caudal process forms a short cone with a few short terminal cirri (De St. Joseph says from eight to twelve unequal cirri). Dorsally the body shows about twenty-eight or thirty transverse brown bars, with a fine dusting of the same pigment between and beyond them. The bars seem to have a definite position, a line drawn from their extremities striking the middle of each space between the so-called eyes, and they thus nearly agree with the number of segments mentioned by De St. Joseph, viz. about thirty. These pigment-spots are the eyes of some and the photogenic organs of Hesse and Benham. They vary, according to De St. Joseph, from ten to sixteen, and commence on the seventh segment. The densest dusting of pigment appears to occur on the anterior and posterior ends, the base of the caudal process, indeed, having a continuous brown blotch. No example has a complete series of pigment-spots (eyes), for they have been more or less bleached by long preservation.

Though at first sight the bristles are not evident, yet they occur in a rudimentary condition in each segment as minute tufts of simple tapering bristles, best seen towards the caudal region. De St. Joseph, who had the opportunity of examining living specimens, observes that the bristles form dorsal and ventral tufts with the intermediate lateral organ of Meyer.

Grube, Filippi, and Claparède's view that this form is only a genus of the Opheliidæ would appear to be reasonable. It resembles the Opheliidæ in general aspect, in the iridescent skin, in the arrangement of the ventral longitudinal muscles, in the presence of the ventral groove between them and the lateral groove above them, as well as in the form of the caudal process and its papillæ. It is further interesting to note how closely the structure of the body-wall in *Polygordius* approaches that in the present group, as shown long ago, and as De St. Joseph more recently corroborates.

* Ann. Sc. Nat. 8^e sér. t. v. p. 386 (1898).

The widely distributed genus *Travisia* of Dr. Johnston, which ranges from Greenland to Kerguelen, is usually associated with the Opheliidæ, and for the present no objection is necessary. The common form, *Travisia forbesii*, occurs in great stretches of sand and sandy mud both on the east and the west coasts, from Shetland to St. Andrews, and ranges to Greenland and other northern waters. In five examples from Greenland the anterior runs into the posterior region without marked distinction, except the gradual disappearance of rings on the segments. Moreover, the total number of segments seems to be smaller than stated by Dr. Johnston, viz. from twenty-five to twenty-eight. In life the British form has a uniform pinkish colour, paler or straw-coloured laterally and posteriorly, and somewhat iridescent both dorsally and ventrally. A coil of intestine which protruded through a rupture was gamboge-yellow. The branchial cirrus has a streak of red. This form is the *Ammotrypane æstroides* of H. Rathke and the *Ophelia mammillata* of Örsted, both of these describing it a little later than Johnston.

The arrangement of the family Scalibregmidæ has recently been carefully attended to by Dr. Ashworth*, the two main groups being: (1) Those in which the head has antero-lateral tentacles, body enlarged anteriorly, feet (after the fifteenth) prominent, with a laminate dorsal and a ventral cirrus; gills on the anterior segments (*Scalibregma*) or none (*Pseudoscalibregma*). In a subsection (B) the simple rounded feet do not form laminate appendages, and the ventral cirri, if present, are confined to the posterior region. Strong curved bristles on the first bristled segment (*Sclerocheilus* and *Asclerocheilus*). (2) The head has a median groove; no tentacles; body maggot-like, feet represented by dorsal and ventral papillæ. No anal cirri. Gills on the anterior segments present or absent (*Eumenia* and *Lipobranchus*). Baron de St. Joseph† had formerly grouped them into those with and those without branchiæ.

Nowhere does *Scalibregma inflatum*, H. Rathke, an example of the first group, flourish so well or attain so large a size as in the Outer Hebrides, where it was known more than forty years ago; yet its range is wide, for it is found on the east as well as the west coast, and extends to Norway, Spitzbergen, and Greenland. The peculiar tessellated appear-

* Quart. Journ. Micr. Sc. n. s. xlv. (1904).

† Ann. Sc. Nat. 8^e sér. t. xvii. p. 103.

ance of the rings, as if they were paved with minute red bricks, is a characteristic feature, and was shown by Rathke; yet they disappear in imperfectly preserved examples, and thus are absent from representations made from these. The body is terminated by a papillose vent, beneath which are four or five cirri, which are unusually long and slender in the small Norwegian specimens dredged by Canon Norman. In life the animal is of a dull brick-red throughout, the tessellated portions being minutely dotted with yellow. The posterior region of the body is often discoloured from the contents of the gut—being dull greyish, and thus throwing the paler lobes of the feet into relief. A slight iridescence occurs on the ventral surface, along which the large ventral blood-vessel passes. The branchiæ commence on the first bristled foot and increase in size from the first to the fifth and last. In small specimens from the west coast of Ireland only four branchiæ are present, but as the first, even in a large example in life, is very small, such may be due to retraction under the surface. Moreover, certain forms agree in all respects with the typical form, but the branchiæ are entirely absent, and Dr. Ashworth states that he has observed the same condition in a few American examples. It is a question whether these should be regarded as specifically different. The coloured sketch made from life in the Outer Hebrides in 1865 represents only four branchiæ.

The first bristles occur on the second body-segment, and in this and the following four are borne on conical processes, dorsally and ventrally, elevated on pads. The bristles are finely iridescent and form slightly radiate tufts. The next nine or ten are similar, but the pads are smaller. About the fifteenth or sixteenth foot a dorsal and a ventral cirrus are evident, and in the posterior region they form somewhat lanceolate lobes with the setigerous process at the inner base of each—that is, below the dorsal and above the ventral. In addition, a series of furcate bristles occur in each foot, but they scarcely project beyond the surface.

In this family is also *Eumenia* (*Lipobranchus*) *jeffreysii*, M'I., as described in 1869, a species dredged off the Hebrides and the Shetland Islands by Dr. Gwyn Jeffreys, and it also extends to Norway and probably to other northern regions. The specific distinction mainly rests on the absence of branchiæ, and if these organs may be absent or present in allied forms, such as *Scalibregma*, a reconsideration of the subject may be necessary. A new form to Britain is *Sclero-*

cheilus minutus, Grube *, first found in the Adriatic in 17-35 fathoms by its discoverer. It was procured on a valve of *Pecten* entangled by a trammel-net on the ground off Fermain Bay, Guernsey, and also between tide-marks at Herm. In this the head is furnished with two well-marked though not long tentacles and two brownish-red ocular bands which form an inverted \wedge by union in front. The body is about $\frac{3}{4}$ of an inch in length, is somewhat fusiform, resembling a miniature *Scalibregma*, slightly tapered anteriorly and more so posteriorly, the surface being minutely tessellated and marked by transverse furrows. It is flanked by a series of short foot-lobes, with rather long tufts of pale resplendent bristles. Posteriorly it terminates in an anal segment provided with five slender cirri. The body has a uniform dull brick-red colour or very pale brownish red, more deeply tinted on the dorsum here and there from the blood-vessel. The mouth opens on the under surface of the peristomial segment as a broad \wedge in the spirit-preparation, the angle directed forward.

The first segment is achetous. The second has dorsally a foot-papilla bearing simple bristles, ventrally a papilla holding a series (five or six) of stout simple bristles finely tapered at the curved tip, though sometimes more or less abraded. De St. Joseph associates these with the making of its galleries in shells, just as in the case of the powerful hooks on the fifth segment of *Polydora*. Their function, whatever it may be, is certainly important, and they are moved by special muscles. They are brownish by transmitted light and have no longitudinal striæ. The next and succeeding segments have simple curved bristles of a fine pale golden sheen on the dorsal and ventral papillæ, which vary somewhat in the different parts of the body, forming shorter cones in front, longer posteriorly. At the base of these bristles and just projecting beyond the skin is a series of bifid forms, one limb of the fork being longer than the other, and the inner edge in both limbs is spinous. Towards the twenty-second segment a slender cirrus, about a third the diameter of the body at its longest, appears below the ventral papilla. According to De St. Joseph its tip is furnished with palpcils in life.

This is a southern type so far as present examples go, but it may yet be found on the western shores. It may have been overlooked from its small size and obscure habits. It bores actively with its snout amongst the mud.


* Arch. f. Naturges. xxix. i. p. 50 (1863), and 'Die Insel Lussin u. ihre Meeresfauna,' p. 85.

De St. Joseph* found it common on shell and oyster-grounds frequented by *Sabellaria spinulosa* off Dinard and St. Malo, at a depth of 7-25 mètres, and corrected Grube's view of the ocular points.

The family Telethusæ or Arenicolidæ is represented by three species, viz. *Arenicola marina*, L., *A. ecaudata*, Johnston, and *A. grubei*, Claparède, as recently and excellently described by Drs. Gamble and Ashworth in several publications, the first-mentioned representing the tailed group, the two latter those in which the branchiæ go to the posterior end. Constantly sought on every suitable beach for bait, no marine form could illustrate better than *Arenicola marina* the permanence of such a marine type, notwithstanding man's efforts to destroy it. Yet it is always easily reached by man, whereas the food-fishes have the wide ocean and all its manifold arrangements as safeguards. This species is ubiquitous in its distribution on the British shores, whereas *A. ecaudata* is a western and southern form, and so is *A. grubei*. Several stages in the development of *Arenicola ecaudata* may be referred to. The smallest example procured between tide-marks at Lochmaddy, North Uist, in August, measures about 4 mm. in spirit, but it would probably stretch considerably more in life. As Dr. Ashworth points out, there is no abrupt narrowing of the caudal region as in the pelagic young of *A. marina* procured at St. Andrews in the bottom-net. No branchiæ are present. The anterior rings are wide, the posterior narrow. There are between fifty and sixty bristled segments. The next stage is represented by a specimen 7 mm. in length from the same locality and on the same date. In front of the first bristle-tuft are the somewhat large blunt prostomium and five rings. The setigerous lobes are distinct, and the first gill arises on the sixteenth. As the anterior segments are much broader than the posterior, the branchial region occupies less than half the length and is characterized by a deep furrow on the dorsum. In the anterior half a single ring is interpolated between the setigerous lobes, but the feet are so crowded posteriorly that no more than one ring to each segment is present at this stage. The branchiæ, which number more than forty pairs, consist for the most part of simple filaments or a pair of filaments, and they appear to be largest anteriorly. The bristles are proportionally longer than in the adult and have a trace of a wing on each side.

* Ann. Sc. Nat. 8^e sér, t. xvii. p. 104.

The anus is median and is crenate from papillæ, and several of the caudal segments are devoid of gills.

The third stage, also obtained between tide-marks at Lochmaddy in August, is about 11·5 mm. in length, and the same general shape is maintained. It agrees with the form described by Prof. P. Fauvel* in his disquisition on the Clymenidian and Branchiomaldane stages in the development of *Arenicola*. There are about forty pairs of gills, but the caudal segments devoid of them are more numerous. Except the first simple gill, all show secondary processes, especially anteriorly, where they form short branched tufts. Moreover, another example of the same length had somewhat longer gills in front, whilst a third agreed with the first. The fourth stage is 16 mm. long, and the body is more attenuate. It also was found in August at Salthill, Co. Dublin. The pigment is boldly marked anteriorly, the snout in front of the nuchal grooves being dark brownish (in spirit), whilst the pale grooves form a broad  with the concavity forward. A dark brown belt succeeds, with a paler area behind. Then three blackish-brown segments follow, whilst the rest of the body is pale brown. The bristle-tufts and the rows of hooks are respectively marked by pale areas and pale bands, the latter continuing a considerable distance along the posterior or branchial region, which is now nearly half the entire length. The gills are longer and more distinctly branched.

3. On the same Families of Annelids in the 'Porcupine' Expeditions of 1869 and 1870.

Very few examples of the three families occurred in these collections, only *Ammotrypane aulogaster*, H. R., being present in the expedition of 1869; yet one or two rare forms were procured.

Thus a *Travisia*, viz. *T. gravieri*, sp. n., was dredged at Station 9 in the 'Porcupine' Expedition of 1870, lat. 48° 06' N., long. 9° 18' W., at a depth of 539 fathoms, on a bottom of grey mud and a temperature of 48°. It is a small form resembling the larva of one of the Diptera, and measuring about 5 mm. in length. The head terminates in a smooth pointed process, the body gently dilating thereafter and continuing as a rounded ringed sac to the posterior end, where a slight diminution occurs before it somewhat abruptly terminates. The rings in the contracted posterior region encircling the central caudal process are distinct. The dorsal

* Bullet. Sc. Fr. et Belg. t. xxxii. p. 287 (1899).

surface is convex, the ventral concave. The body is closely ringed from the base of the prostomium to the caudal process, and the anterior dorsal surface is tessellated as in *Scalibregma*, but the ventral surface is smooth. At first sight feet appear to be absent, but closer inspection shows a pair of minute papillæ on every third ring. No bristles were present.

Another species, apparently very near the *Ammotrypane cylindricaudatus* of Hansen *, from the "Norske Nordhavs-expedition i 1876," has an acutely conical head ending in a slender process with a clavate tip, as in *A. gracilis* of the 'Challenger' †, and thus agreeing with Örsted's genus *Ophelina*. The ventral longitudinal muscles pass almost to the extremity of the snout. Mouth a short distance behind the latter. The body is very slender, with numerous branchial cirri, which are conspicuous posteriorly, as also are four setigerous processes in front of the caudal appendix, which is cylindrical or somewhat clavate, transversely marked by minute ribs, as also in the *Ammotrypane delapidans* of Kinberg ‡, first procured at Valparaiso, and afterwards described by Ehlers § from various parts of Chili, and with an uneven posterior margin—that is to say, the dorsal edge forms a prominent papilla, the ventral being less, whilst an elevation occurs between them. In the majority the process is gradually narrowed to its base, so that it is really somewhat clavate. The bristles are short, simple, and tapering. This form ranges from Station 17 a, at 795 fathoms, in the 'Porcupine' Expedition of 1870 to Norway and Canada. Hansen's description and figures leave some doubt as to the actual identity, but such may be partly due to the larger size and more perfect condition of his specimens. Thus he describes and figures the head as similar to that of *Ammotrypane aulogaster*, H. R., whereas in this it forms an acute cone ending in a slender process with a clavate tip. The caudal process in both is similar in general outline, and so with the four lateral setigerous processes in front of it; but the processes on the posterior margin differ in the small examples from the 'Porcupine,' it may be from friction or other injury. Moreover, the organ appears to be readily reproduced. On the whole, the two forms seem to be identical. The *Armandia weissenbornii* of Kükenthal ||, from Perim, is

* Nyt Mag. f. Naturvid. Bd. xxiv. p. 8, Taf. vi. figs. 1-8.

† Annel. 'Challenger,' p. 357, pl. xliii. figs. 9, 12.

‡ Öfvers. K. Vet.-Akad. Förh. 1865, no. 4, p. 258.

§ Polychæt. Magell. u. chil. Strandes, 1901, p. 173, Taf. xxii. fig. 9.

|| Jenaische Zeitsch. Bd. xxi. N. F. xiv. p. 366, Taf. xxi. fig. 6.

an allied form, the caudal process being as long as the last four segments and with numerous rings, but its tip has several slender papillæ. The *Ammotrypane langii*, of the same author*, from the Philippines, has a somewhat shorter ringed caudal cylinder.

A third form, *Ammotrypane* (*Ophelina*) *kükenthali* †, sp. n., was dredged in the 'Porcupine' Expedition of 1870, in 795 fathoms. It is distinguished by its pointed snout, with its slender clavate papilla projecting beyond it, and its slender elongated body, like that of *Polygordius*, about 25 mm. in length, tapered a little anteriorly and posteriorly, rounded dorsally, and grooved ventrally. The ventral longitudinal muscles run on each side from the region of the mouth to the base of the caudal process, and have the usual lateral groove above them, but, so far as observed, neither bristles nor pigment-specks are present. Posteriorly the body somewhat abruptly narrows to the short, cylindrical, caudal process, which has a smooth edge posteriorly—in one example oblique and in the other rounded; but as both seem to have been more or less dried, there is uncertainty on this point. The slender, smooth, glistening body, and the absence of bristles as well as of cirri and papillæ on the caudal process are features of moment.

4. *On the foregoing Families dredged by Dr. Whiteaves in the Gulf of St. Lawrence, Canada.*

The representatives of the foregoing are comparatively few, and, indeed, are confined to one family, viz. the Opheliidæ. The fact that little or no shore-collecting was done perhaps accounts for the absence of the Telethusæ, and, to some extent, of the Scalibregmidæ, though the representatives of the latter also occur in deep water. Of the Opheliidæ, *Ammotrypane aulogaster*, H. Rathke, is not uncommon and of good size, and *Ammotrypane cylindricaudatus*, Hansen, was also procured.

A fine example of *Ophelia radiata*, Della Chiaje (Pl. XVII. fig. 1), was dredged at Station 61, viz. north-north-east of Shediac Island, 4th September, 1873, probably in water not

* *Ibid.* p. 365, Taf. xxi, figs. 4 & 5.

† After Prof. Kükenthal, of Breslau, the author of a paper on the Opheliaceæ of the 'Vettore Pisani' Expedition, *Jenaische Zeitsch.* xxi. Bd. N. F. xiv. pp. 361-373, Taf. xxi. (1887).

more than 10 or 12 fathoms' depth, though this is not stated. It is distinguished superficially by the more regular and more definite cuticular ridges anteriorly (Pl. XVII. fig. 2), by the more elongated and more acute head, by the smoother and more glistening body throughout the posterior region, by the presence of two sets of cuticular ridges towards the tail, two occurring a little in front of the caudal hump and four on the edge of the downward slope to the caudal process, which generally agrees with that of *Ophelia limacina*, while differing in detail. The mouth is more posterior in position than in *O. limacina*, and the anterior region, viz. that in front of the cirri, is considerably longer. The cirri are much longer and have a warty aspect, from little papillæ or elevations—it may be due to extravasations. On the other hand, the bristles are less developed, a feature conspicuous posteriorly in *O. limacina*, where they form a fringe on each side of the dorsal groove of the caudal process. No well-marked groove occurs on the dorsum of this process in *O. radiata*, and the process itself is shorter. Ventrally both are deeply grooved to the tip, but the two ventral cirri of *O. limacina* are considerably smaller and terminated by two clavate or button-like processes, whereas the ventral cirri of *O. radiata* are broadly ovate flattened processes, conical posteriorly, and ending in a simple very slightly tapered filament (Pl. XVII. fig. 4). Della Chiaje shows fourteen cirri, forming the upper arch of the tail, whereas Claparède * describes and figures only eight. On the other hand, Baron de St. Joseph † gives sixteen, including, however, the two median ventral, in his differentiation of the species from *Ophelia neglecta*. In the present example five occur on each side and a median cirrus dorsally, so that the total number is eleven ‡ (Pl. XVII. fig. 3). This species is the common one at Naples, and the sexes are distinguished by colour, the males being pale. The ova are greenish. Claparède gives considerable attention to its structure in the work just referred to, and puts a different interpretation on the diverticula on the dorsum of the œsophagus from that given by several of his predecessors, who varied in interpretation from salivary glands and respiratory organ to heart. This muscular organ he associated with the stiffening of the snout by the perivisceral fluid during its boring in the sand and muddy sand. De St.

* Annél. Chétop. Naples, p. 284, pl. xxvi. fig. 1 c.

† Ann. Sc. Nat. 9^e sér. t. iii. p. 231 (1906).

‡ The artist makes seven on each side of the median. It has not been possible to check these figures before publication.

Joseph * points out the distinctions of this species from *O. neglecta*, A. Schneider, in his detailed description of that form, which has eighteen anal papillæ besides the two larger ventral cirri.

5. *On the same Groups dredged in Norwegian Waters and in Finmark by Canon Norman.*

Both *Ophelia limacina*, H. R., *Ammotrypane aulogaster*, H. R., and the widely distributed *Travisia forbesii*, Johnston, are not uncommon in the fiords. Moreover, the finest example of the second comes from Finmark. *Ammotrypane* (*Ophelina*) *cylindricaudatus*, Hansen, likewise occurs in the same fiords near Bergen. *Scalibregma inflatum*, H. R., is often dredged in the same seas, but all the examples are small, especially in contrast with the large specimens from Lochmaddy, North Uist. No example of the Telethusæ is present, the absence of these littoral annelids being due to the fact that dredging alone was resorted to, and this in water of considerable depth.

EXPLANATION OF PLATE XVII. †

- Fig. 1.* *Ophelia radiata*, Delle Chiaje, in profile. Enlarged under a lens.
Fig. 2. Anterior end from the dorsum, to show the acutely conical snout and the ridges of the skin. Enlarged under a lens.
Fig. 3. Caudal processes from the dorsum. Enlarged under a lens.
Fig. 4. Caudal processes from the ventral surface. Similarly enlarged.

LXIII.—*On certain African and S.-American Otters.*
 By OLDFIELD THOMAS.

SINCE I wrote my paper on the arrangement of the otters in 1889 ‡, opinion has changed as to the value of the characters which should justify generic distinction between different groups, and I am now prepared to admit, with other authors, that the clawless otters (*Aonyx*) and the margined-tailed otter of Brazil (*Pteronura*) should be recognized as generically different from the ordinary otters of the genus *Lutra*. The two species of *Aonyx*, *A. capensis* and *cinerea*, widely different

* Ann. Sc. Nat. 8^e sér. t. v. p. 369, pl. xxi. figs. 181–195, and pl. xxii. figs. 196–199.

† I am indebted to the courtesy of the Carnegie Trust for the figures on this Plate.

‡ P. Z. S. 1889, p. 190.



M'Intosh, William Carmichael. 1908. "LXII.—Notes from the Gatty Marine Laboratory, St. Andrews.—No. XXIX." *The Annals and magazine of natural history; zoology, botany, and geology* 1, 373–387.

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