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XXXIV.—Notes from the Gatty Marine Laboratory, St. Andrews.—No. No. XX

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at the base, 4 basal, very short and arched, sutural well shortened before the base, the surface, except in the scutellar region, is punctured, punctures not close nor so large as those of the thorax; the propygidium is evenly and rather closely punctured; the pygidium is more clearly punctured and the punctures are larger, and there is a narrow longitudinal space in the middle of the base smooth; the prosternum, keel slightly depressed in the middle, striæ cariniform, joining anteriorly, and it widens out at the base; the mesosternum is truncate anteriorly and the marginal stria complete, surface punctate; the metasternum is smooth in the middle, with a few punctures near the edges, and on the anterior margin is a small round impression; the anterior tibiæ are 4-dentate.

The peculiar oblong form of this species is unlike any other that I know, but it must be placed near *S. lætus*, Er.

Hab. Taylor Range, Queensland.

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

[Plates VII. & VIII.]

1. On the Reproduction and Development of *Pholoë minuta*, O. Fabr.
2. On the British Nephthydidae.
3. On *Nephthys (Aglaphanus) inermis*, Ehlers, from the 'Porcupine.'
4. On the Nephthydidae of the Gulf of St. Lawrence, Canada.

1. *On the Reproduction and Development of*
Pholoë minuta, O. Fabr.

At St. Andrews ripe males are common at the end of June, so that the breeding-season would seem to be in July and perhaps also in August. On the west coast, at Lochmaddy, specimens in similar condition were found in August. No ripe females have been captured at St. Andrews, but examples from Greenland present well-developed ova in July.

Trochophores apparently of this species occur at the bottom in the second week of September, presenting only four crenations posteriorly to indicate the segments. The next stage has a bluntly conical prostomial region which occupies about half the bulk of the animal. Two small black specks are situated posteriorly. At each side are the short tentacular cirri. Four bristled feet follow, each having stout bristles of the typical structure. Two spines occur on the dilated end of the shaft in each, the longest being inferior. In addition

there are two much more slender bristles with long, tapering, diaphanous, terminal pieces, apparently larval ventral bristles. The dorsals have the adult structure, being slender, tapering, hair-like, serrated bristles. The dorsal cirrus is much enlarged at the base, but with a slightly tapered tip. Viewed from below the ventral cirrus shows a similar dilatation (ceratophore) at the base and a two-jointed cirrus, a globular papilla occurring some distance inwards.

The body, which is marked by transverse lines, terminates posteriorly at this stage in a broad pygidium. The three pairs of scales of a globular outline are borne on pedicles, the outer edge of each having several large truncate papillæ which greatly exceed the proportions in the adult.

In the next stages, found on the same date, the snout is truncated and the caudal process has a dimple in the middle. Then the head becomes defined as an oblong mass, rounded in front, and flanked on each side by the tentacular cirri, which are now directed forward. There are still only four bristled feet. The cilia on the scales are larger, and two short broad caudal cirri have appeared under the pygidium.

Fig. 1.

Anterior end of young *Pholoe*, $\times 100$. 4th February, 1899.

The bottom tow-net again procured, on the 4th February, in 5 fathoms, a young *Pholoe* having thirteen bristled feet on each side. The head bears in front two closely approximated median eyes (fig. 1) and two are more widely situated towards

the posterior border. Both pairs have a rounded lens-like differentiation. The median tentacle is prominent, while two shorter tentacular cirri occur on each side. These are sparsely covered with minute papillæ. The palpi have enlarged basal regions and taper to a blunt point. The body is flattened and of nearly uniform diameter, though slightly tapered in front and more distinctly posteriorly, where it terminates in a rounded "boss" on each side of the vent (fig. 2), the globular

Fig. 2.

Posterior end of young *Pholoe*, $\times 100$.

cirri of the last pair of feet projecting a little in front. The proboscis is furnished with well-marked teeth. The number of scales is uncertain, though four pairs remained. Most had five cilia on the outer border, though one, probably the first, had seven. Lines radiating from the centre of the scale to the base of the cilia probably indicated nerve-strands. The feet show dorsal and ventral divisions each with a spine and the characteristic bristles.

The life-history of this form thus corresponds with that of its allies, the larval stage being pelagic, the young by-and-by settling on the bottom like their parents. A wide distribution is thus attained.

2. On the British Nephthydidæ.

In the 'Catalogue of the British Museum,' published in 1865, three species of *Nephthys* are mentioned, viz. *N. cæca*, Fabr., *N. longisetosa*, Cæst. (?), and *N. Hombergii*, Aud. & Ed. Dr. Johnston, however, had not seen an example of the latter, which had been mentioned by Dr. Williams, and the precise

relationships of *N. longisetosa* are doubtful—indeed, in all probability it may refer to the long-bristled form of *N. caeca*. The dredgings of the 'Porcupine' and 'Knight Errant,' of Dr. Gwyn Jeffreys in Shetland, those of Canon Norman in the same region and in Norway, and of the Royal Irish Academy under Prof. Haddon and Dr. Scharff, have considerably extended the species, so that there are at least double, and perhaps treble, the number now known as British.

The characters by which the species of *Nephthys* are distinguished from each other are less evident than in many other families of Polychæta, and the observer is at first dissatisfied, especially in regard to the structure of the bristles, with the essential features diagnostic of each. A careful consideration of the form of the head, the structure of the feet, and the bristles, which are borne on the anterior face of each foot, with other features, however, shows that, so far as known, the distinctions are reliable, though it must be remembered that further information in regard to sexual variation is needed.

Accordingly the following nine species are found to be natives of Britain :—

The most abundant as well as the largest form is *Nephthys caeca*, Fabr., in which the wedge-shaped head is rounded in front, with two sensory papillæ posteriorly. The body is moderately elongate and of considerable thickness. Posteriorly it terminates in an anus with a median tapering cirrus ventrally. The proboscis has twenty-two rows of papillæ, five (or occasionally six) being in each row. The dorsal lamella of the foot is fan-shaped and prominent, its deepest part being external; dorsal cirrus short and tapering; branchial process of considerable length, coiled externally, and with a semicircular flap of the spinigerous lobe at its base anteriorly. The ventral division of the foot has a large, broadly lanceolate, and pointed lamella continuous with the fleshy lobes of the region. The ventral cirrus is of moderate size, slightly flattened and conical. In front of the dorsal lamella is a row of pale, elongate, serrate bristles which extend outwards fully three times the diameter of the lamella. The serrated edge, forming a simple saw-like arrangement in lateral view, is really composed of a close series of transverse spikes in each division. The bristle extends distally as an extremely attenuate process, and tapers to a fine point devoid of serrations. A narrow fleshy ridge, with the tip of the spine projecting externally, comes next the foregoing bristles, and then a series of the pale barred or camerated bristles in front. No free flap guarding these bristles in front is present in this

species. The foregoing, constituting the dorsal division, is separated by a considerable interval from the ventral division of the foot, the intermediate region being occupied by the branchial process. The inferior lamella is broadly lanceolate, pointed, and with the longer edge inferior. It is continuous with the fleshy lobe of the foot, the tip of which slopes from below upward and outward—the reverse of the arrangement in the upper lobe. The fleshy part terminates superiorly in a thickened adherent point. The long pale capillary bristles pass out, similarly to the dorsal, close to the lamella, and extend outwards about the same distance, and have the same structure. A narrow fleshy ridge, corresponding to the foot proper, separates the capillary from the row of barred bristles in front. The conical ventral cirrus is slightly flattened and of moderate size.

Common everywhere round the shores of Britain.

The next species, *Nephtys scolopendroides*, Delle Chiaje, is perhaps more generally known by other names, such as *N. Hombergii*, Aud. & Ed., and *N. assimilis*, Ørsted. It extends from Shetland to the Channel Islands, along both shores, as well as to Ireland. The rectangular head is more elongated than in *N. caeca*, and the tentacles are more slender, the posterior pair, as usual, being larger than the anterior. The wide base of the inferior tentacular cirrus (Ehlers) merges into the anterior lips. The body as a rule is smaller than that of *N. caeca*. Proboscis with a slightly longer terminal papilla in the mid-dorsal line. The dorsal lamella of the foot is broad and low, projecting beyond the tip of the foot; dorsal cirrus short. Branchiæ large, often curved inwards, and with a process at the base, commencing on the fifth foot. A tongue-shaped inner flap guards the base of the bristles, and another (somewhat pointed) occurs at the tip of the foot. The lamella of the ventral division is large, directed upwards and outwards, and is broad and truncated at the tip. Ventral cirrus short and broadly lanceolate. The serrate bristles are shorter than in *N. caeca*, have long shafts and an expanded blade bent downwards at an angle and tapering somewhat quickly to a delicate point. The barred bristles (anterior) approach those of *N. caeca*, the tips perhaps being shorter.

The third form is *Nephtys ciliata*, O. F. Müller, a species chiefly Zetlandic, though it stretches both to the American and European shores of the North Atlantic. The head is longer than broad, with a wide anterior border and more slender tentacles than in *N. caeca*. In extrusion the proboscis

is generally papillose, with distal rows (twenty-two in number) of slender elongated papillæ, of which each row has from 5-7. A median cirrus in front of the rows in the mid-dorsal line. The body has from 90-132 segments or more. Foot with the dorsal lamella rounded, its greatest vertical diameter being median and its axis directed upwards. At the outer edge of the foot is a smaller rounded lamella. Dorsal cirrus slender and long. Branchial process of moderate length. Inferior lobe sinuous below the small terminal lamella, with a small papilla at the inner border of the latter superiorly. Ventral cirrus large and conical. Bristles brownish, comparatively short, the serrated forms having a distinct curvature of the dilated region beyond the shaft and a serrated edge. The barred forms are finely tapered.

The fourth species, *Nephthys hystricis*, sp. n., comes from Berehaven (Royal Irish Academy's Expedition), from various stations in the Mediterranean during the 'Porcupine' Expedition of 1870, and a closely allied, if not identical, form was obtained by Canon Norman off Bergen. The head is elongated from before backward, with rather pointed subulate tentacles anteriorly, the broader second pair following after an interval. Peristomial segment ventrally with two broad flaps and a symmetrical series of furrows. Body resembling that of *N. ciliata*. Proboscis comparatively short, with slender papillæ in twenty-two rows. The mid-dorsal pair converge on the long tentacle immediately in front, and the rows on each side of the mid-ventral line converge in a more marked manner; but there is no median filament. As a rule four papillæ occur in each row, but in some there are traces of a fifth, and in the ventral pair (on each side of the median line) six short papillæ. Foot with a long, little elevated, dorsal lamella, which does not extend so far outward or droop at the tip as in *N. scolopendroides*. It approaches in form the foot of *N. ciliata*, but differs in the shape of the dorsal lamella and in the fact that in front of the capillary bristles the spinigerous region forms a low cone with the spine at the apex, the barred bristles arising in the fissure between it and a large flap or lamella formed by the fillet guarding the bristles, whereas in *N. ciliata* the spinigerous region itself forms the free flap. The dorsal cirrus is somewhat thick, separated only by a shallow notch from the branchia, which is of moderate size, has a papilla at its outer base, and is curved outward. Bristles similar to those of *N. scolopendroides*, but thinner. Inferior division of the foot with a small lamella posteriorly, another nearly as prominent formed by the fillet for the barred bristles,

the conical spinigerous lobe lying between. In several views therefore the tip is trifid.

A fifth British example is *N. longisetosa*, Ørsted (1843), a very different species from the *N. longisetosa* (Ørst.) of Dr. Johnston, which may have been the long-bristled form of *N. cæca*, though Malmgren found the examples in the British Museum to comprise *N. scolopendroides* and another species. In this the head is somewhat shield-shaped; the anterior tentacles marked by a translucent stripe in front, long and slender; second pair also long and lanceolate. Proboscis distinguished by fifteen rows of 11–15 papillæ*. Dorsal lamella of the foot elevated and prominent, with an accessory rounded process. Dorsal cirrus large and lanceolate, closely connected with the base of the branchia, only a shallow notch intervening, and the branchia is often curved inward. Ventral division with a tongue-shaped lamella above the dorsal edge at the tip, and only a narrow lamella beyond the foot. Both barred and serrated (capillary) bristles are yellow or brownish, with a metallic sheen, and largely developed, the latter presenting a gentle curve from base to apex, the minute spines being traceable from the short shaft to the tip.

Another species, somewhat allied to the foregoing, is *Nephtys Grubei*†, sp. n., which was dredged at station 8 on board the 'Knight Errant,' 17th August, 1880, in 540 fathoms in the Atlantic. The head is elongated from before backwards, with a straight anterior edge, which is somewhat narrower than in *N. longisetosa*. The tentacles at the outer angles are conical, tapering, and have a translucent area at the inner border. The second pair follow close on the first and have the form of an acuminate leaf, whereas in *N. longisetosa* they are more widely separated from the first, are proportionally longer and more pointed. At each angle of the head posteriorly is a papilla, probably sensory, the corresponding organ in *N. longisetosa* being inconspicuous. The proboscis is included, but the arrangement of the parts around the mouth is similar. The first foot differs from that in *N. longisetosa*, for it has a well-marked subulate dorsal process or cirrus, besides the lanceolate ventral one, whereas in *N. longisetosa* only a small papilla occurs dorsally and the ventral cirrus is much longer. In the typical foot the dorsal

* Malmgren gives 14.

† Named after the late Prof. Edouard Grube, of Breslau, a distinguished investigator of the Annelids.

lamella is narrowed at its attachment, broader and somewhat truncated distally, the reverse being the case in *N. longisetosa*. Instead of a distinct flap externally only a trace in the shape of a fillet occurs. The dorsal cirrus is less, while the branchia is longer, though it is likewise curved inward. The spinigerous lobe is produced further outwards as a pointed process and has a different angle. Moreover, the fillet guarding the barred bristles is convex upwards. In the inferior division the posterior lamella is considerably smaller, the spinigerous lobe is longer and more acute, whilst anteriorly the upper fillet is smaller. The ventral cirrus is smaller and less tapered than in *N. longisetosa*. Both barred and slender bristles are more slender than in the latter species, though in both the transverse bars of the camerated bristles extend downward till the full diameter of the shaft is reached.

The seventh form is *Nephthys Johnstoni*, Ehlers, which has a shield-shaped head, a broad and somewhat convex anterior border, a slender tapering tentacle at each angle, and an oblique translucent patch at its base internally. The second pair occur after a considerable interval. The proboscis has rather long rows of papillæ distally and a median cirrus dorsally and ventrally. Between the rows at the aperture is a simple papilla dorsally and ventrally. The anterior folds or lips in front of the mouth are large. The dorsal lamella has a similar curvature to that of *N. ciliata*, but it extends further outward, and only a trace of the rounded terminal lobe appears. The setigerous region stands up prominently and is smoothly rounded externally. No free flap to the anterior fillet guards the barred bristles. The dorsal cirrus is a variable filiform process. The branchia is not large and is coiled externally. The ventral lamella is large and ovato-lanceolate, and the ventral cirrus is lanceolate, larger than in *N. ciliata*, considerably less than in *N. longisetosa*. The capillary bristles are longer and less rigid than in the latter, and the serrations are very fine, the long distal region being smooth. The barred region in the anterior bristles is long and slightly fusiform.

Nephthys cirrosa, Ehlers (1868), is the eighth British species, characterized by a seven-sided head, longer than broad, with a pair of conical tentacles in front and a longer latero-ventral pair after a considerable interval. A small papilla (sensory) lies on each side of the head posteriorly. Proboscis with the normal rows (twenty-two) of rather long papillæ, each row having six or more papillæ. Shorter

papillæ are scattered over the general surface of the organ. A single slender median dorsal cirrus is present. Foot with a rather long low dorsal lamella, deepest in the middle. No other flap. Dorsal cirrus of average length, subulate and rather slender. Branchia of moderate size, slightly coiled outward. The ventral division has a posterior lamella of moderate size directed upwards and with a small flap superiorly over the base of the bristles. The ventral cirrus is prominent and somewhat conical. Bristles rather long and curved, pale golden; longer (capillary) forms with a marked curve of the blade and a finely serrated edge. Barred forms with a spindle-shaped camerated region.

The ninth and last British species is one near *Nephthys incisa*, Malmgren, which was procured on the shores of Connemara, Galway, by the late Mr. A. G. Moore. In this the head is somewhat shield-shaped, slightly wider in the middle, and marked by two pale lateral areas which map out the surface. Anterior and ventro-lateral tentacles small and conical. The proboscis has rows of minute papillæ and a short dorsal cirrus (Malmgren). The foot has a rounded dorsal lamella extending nearly to the tip of the organ, and somewhat like that of *N. longisetosa*, Erst., though differing both from that and *N. ciliata*. The small dorsal cirrus is leaf-like and pointed, separated by a shallow notch from the rather massive though short branchia, which has the tip bent outward and forward. The branchia diminishes and disappears posteriorly. Spinigerous lobe small, hidden between the rows of bristles. Fillet guarding the base of the barred bristles developed into a free flap posteriorly and inferiorly. Inferior division of the foot trifid, the anterior fillet projecting most superiorly. Neither flap is much developed, and the spinigerous lobe is conical. The bristles are dark brown, the anterior having the barred region beyond the widest part, and the capillary forms being curved and minutely serrated. The most marked features of the species are the dark brownish bristles, the slight development of the lamellæ, and the wide space between the divisions of the foot.

3. *On Nephthys (Aglaophanus) inermis, Ehlers, from the 'Porcupine.'*

Though not falling within the British area, another species, dredged in the 'Porcupine' Expedition of 1870 off Cape Finisterre, in 81 fathoms, may be alluded to, viz. *Nephthys*

(*Aglaophanus*, Kbg.) *inermis*, Ehlers *. It was first obtained in the American expedition in the 'Blake,' under Count Pourtales, in 1869, off Alligator Reef, at a depth of 53 fathoms; but the description was twenty years later in being published. The head is somewhat pentagonal, nearly straight or slightly convex in front, and devoid of the tentacles at each angle. The ventral tentacles are small and subulate, but occupy the usual position, though they do not project laterally. The buccal region considerably diverges, for there are no folds in front of it and only a median and two lateral grooves behind it. The body somewhat resembles that of a *Nereis*, from the great length of the branchial processes, which project like cirri. The proboscis (Pl. VII. fig. 6) is perfectly smooth, though Kinberg †, in his original description, gave it two fusiform maxillæ.

The typical foot in the anterior region (Pl. VII. fig. 7) shows comparatively short and widely separated divisions. The dorsal lamella is of moderate height and extends far outward. The dorsal cirrus is large, long, closely attached to the base of the branchia, which is long and coiled inwards and has a cylindrical papilla at its base externally. The bristles are dark and occur in a small and somewhat elliptical area, having the spine in the centre. The posterior tuft is composed of simple, rather stout and short, tapering bristles, with minute serrations on the edge of the blade (Pl. VIII. fig. 1), shorter lyrate forms (Pl. VIII. fig. 2) being mingled with them. The anterior tuft is also dark and has long and finely tapered bristles with indistinct transverse markings, which fade towards the tapering extremity (Pl. VIII. fig. 3).

The inferior division of the foot has a large spatulate lamella superiorly, while the cirrus projects nearly as far, as a somewhat conical process. The tip is thus bifid in lateral view. The bristles form a loop closed superiorly and open inferiorly—that is, the anterior tuft touches the posterior superiorly but is separate inferiorly. The rudimentary condition of the transverse markings in the anterior bristles, for they form closely arranged and somewhat indistinct granular bars, is interesting. A peculiarity of the ventral division of the foot is the presence of a fold of skin passing as a free flap backward and then slightly upward, so as to form a process between the feet. Viewed from the ventral surface each foot thus is ensheathed at the base.

* Ehlers, Mem. Mus. Comp. Zool. Harvard Coll. vol. xv. p. 125, Taf. xxxviii. figs. 1-6 (1887).

† "Annul. Nova," Öfversigt K. Vet.-Akad. Förhandl 1865, p. 229.

E. J. & A. (7. del.)

Mutten Bros. lith.

Posteriorly the height of the dorsal lobe diminishes and it projects as an acute process. The length of the dorsal cirrus and branchia increases, and the lamella and cirrus in the inferior division are also considerably elongated, so that they form two slender processes. Just in front of the tail the branchia is reduced to a short process. Inferiorly the ventral cirrus is large, but the lamella above it has disappeared.

In contrasting the foregoing with the descriptions and figures of Ehlers, the elongated upper lamella in the European form differs. Moreover, Ehlers states that the anterior tufts of bristles do not show the transverse markings, whereas, though less distinct than in the typical form, such are present in the European. The mode of preservation, however, may be connected with this difference. Ehlers refers to the scale-like ventral fold at the base of the foot.

4. *On the Nephthydidæ of the Gulf of St. Lawrence, Canada.*

These formed part of a very interesting collection of annelids made by Mr. J. F. Whiteaves (now of the Canadian Geological Survey) in 1871, 1872, and 1873, the result of several dredging expeditions in the Gulf. A previous paper on the subject will be found in the 'Annals' for April 1876. An abundant form is *Nephthys ciliata*, O. F. M., a widely distributed species on European shores. One of the Canadian examples is large and another has a Crustacean parasite attached dorsally.

Nephthys canadensis, sp. n.

Dredged at Stat. A 1 and A 8, 1872, and no. 29, Bradelle Bank, 1873.

Head elongated from before backward and with a pair of short conical anterior tentacles. The second (ventral) pair are somewhat lanceolate and occur after an interval. The cirri of the first foot are also short and lanceolate.

Body of the typical form and attaining a considerable size, probably at least 6-7 inches. The furrows of the middle region behind the mouth slant from the median line outward and backward. The proboscis shows numerous small papillæ at its distal end in extrusion, the rest being smooth. No specimen, however, shows the organ completely extruded.

The foot (Pl. VII. fig. 1) presents two widely divergent regions, as in *N. incisa*. Anteriorly the dorsal division has a small rounded lamella at its base, the flattened dorsal cirrus

is minute (in some indistinguishable) and closely attached to the base of the short and broad branchial process, which shows only a slight concavity externally. In translucent preparations this lamellar branchia shows a crenate membranous border and large central trunks. The setigerous lobe is prominent and in side view forms a projecting lamella both above and below the spine. No fillet occurs at the base of the barred bristles. The bristles are of moderate length, with a curve backward. Both the barred and the elongated kinds are somewhat slender, the former being marked by close transverse bars and tapering to a fine point (Pl. VIII. fig. 4); the latter also slender and tapering to a delicate tip, the blade with distinct serrations (rows of spikes) on the expanded region above the shaft (Pl. VIII. figs. 5 & 6), the tip apparently smooth. The serrations, however, are easily removed.

The inferior division stands widely apart, without a lamella or occasionally only a trace. It has a blunt point and extends further outward than the dorsal. The spinigerous lobe is flattened and conical, with the spine at the apex. The fillet at the base of the barred bristles sends a process superiorly. The inferior cirrus is of moderate size and conical in shape.

Posteriorly the dorsal and ventral lobes of the feet become prolonged and acute. A trace of the dorsal lamella is still visible. The branchia, however, has shrunk to a minute process beneath the small cirrus. The inferior division has approached considerably nearer the upper and extends as a long pointed lobe half its length beyond the upper, and the ventral cirrus is carried outward nearly in a vertical line with the branchia.

The feet and bristles were studded with numerous examples of a whitish clavate ecto-parasite like *Loxosoma*, which, however, had a series of spine-like processes, either lateral or terminal.

Nephtys lawrencii, sp. n.

Dredged on Bradelle Bank, Gulf of St. Lawrence, Canada, 1873; at Stat. A 1, 1872; and off Port Hood, 1873.

The head is somewhat longer than broad, though in extrusion of the proboscis it becomes shield-shaped. A short and somewhat flattened conical tentacle comes from each angle of the rather narrow and straight anterior margin. The second or ventral tentacles, which are separated from the first by a short interval, are similar in shape but scarcely so large. Two slight elevations occur on each side of the median line posteriorly. In the ordinary position of the proboscis within the body the ventral cirrus of the first foot shows a somewhat

expanded base, and thus an approach to the *N. buccera* of Ehlers is made; but this, at any rate, is apparently variable and much more marked, for instance, in *N. caeca*.

Body of the normal shape, the folds of the triangular post-oral region slope from before backward and slightly outward on each side. The extruded proboscis is comparatively smooth, for the papillæ in the rows of the first region are small. A long and strong cirrus, however, occurs in the median line dorsally. The papillæ around the aperture distally are ten in number on each side and normal in shape.

The typical anterior foot (Pl. VII. fig. 2) has an elongated though not high lamella superiorly behind the bristles. Both inner and outer edges are somewhat abrupt. The shape thus differs from that of *Nephtys longisetosa*, Cerst., to which it bears some resemblance. The spinigerous lobe is conical in antero-posterior view. The fillet at the base of the barred bristles rises into a lamella superiorly and again externally. The dorsal cirrus is thin and lanceolate, forming a comparatively large foliaceous expansion, sometimes with a thickened rib inferiorly. The branchia is separated from it only by a shallow notch, and is of considerable size. The tip is directed outwards. The barred bristles (Pl. VIII. fig. 7) are finely marked, and the simple bristles (Pl. VIII. fig. 8) are rather short, with a distinct curve where the shaft joins the blade, which is but little expanded. From the curvature almost to the tip the edge is minutely serrated. Similar bristles occur in the ventral division. All are dark, with a fine metallic sheen. The inferior division has a slight lamella from the fold superiorly, passing outward and downward behind the bristles nearly to the ventral border of the foot. The spinigerous lobe is acutely conical and the fillet guarding the bases of the barred bristles is distinct, folding over superiorly to join the posterior lamella and inferiorly ending in front of the ventral cirrus. It projects a little beyond the fleshy part of the foot. The flat and conical ventral cirrus is not much developed. The ventral edge of the foot from the tip inwards seems to be thin, forming a translucent narrow belt inferiorly.

Certain features approach those of *Nephtys scolopendroides*, but the form of the lamellæ and fillets and the cirri distinguish it.

Nephtys picta, Ehlers.

1868. *Nephtys buccera*, Ehlers, Die Borst. ii. p. 617, Taf. xxiii. fig. 8.

1868. *Nephtys picta*, Ehlers, Die Borst. ii. p. 632, Taf. xxiii. figs. 9, 35.

Dredged by Mr. Whiteaves in the Gulf of St. Lawrence, Canada, no. 61, 1871, and at A 1, 1872.

Only fragmentary specimens were obtained.

Head (Pl. VII. fig. 3) somewhat shield-shaped, widest in front, the anterior edge being convex. The anterior tentacles are subulate and somewhat long, with a translucent space at the inner edge of the base. The second pair are represented only by a small process at the posterior part of the head ventrally. Ventral cirrus of the first foot longer than the tentacle, tapering from a broad base to the tip.

The lips in front of the mouth (Pl. VII. fig. 4) ventrally are remarkably small, leaving the head in front entirely clear, as well as the ventral cirrus of the first foot, whereas in such as *Nephthys caeca* the oral fold on each side is confluent with and even passes slightly in front of this structure. The triangular area behind the mouth has the furrows with a gentle slope from within outward.

Proboscis.—The extruded organ (Pl. VII. fig. 8) shows rows of rather long papillæ distally, apparently about four in each row, and dorsally a single slender cirrus. The bifid papillæ surrounding the aperture have a long slender external limb. Their number seems to agree with that in allied forms.

The first foot bears a small tuft of forwardly-directed, simple, and apparently smooth bristles, with a distinct curvature, passing close to the margin of the head, and a more erect papilla with a series of transversely barred bristles of minute size. The ventral cirrus is conspicuous and subulate, tapering from a flattened expansion at the base.

The typical foot (Pl. VII. fig. 5) has a dorsal lamella which projects as a somewhat fan-shaped process outward as far as the tip, and having its greatest vertical diameter about the middle. It is slightly bent in the figure. The dorsal cirrus has a curiously enlarged and flattened base superiorly and is subulate. The branchia is comparatively short and with a slight curve outward. An external basal process is present, the incurvation between this and the dorsal cirrus being short.

The lamella of the inferior division is moderately developed, with an obliquity at its inferior margin. It is largest superiorly. The ventral cirrus is flattened and lanceolate, though, as usually seen, the narrow edge only is visible.

Two kinds of long posterior curved bristles occur on each foot, viz. those without evident serrations and those which have the convex edge of the long flattened blade minutely serrated, and at the convexity of the curve beyond the short shaft present about five or six larger hooks (Pl. VIII. figs. 9 & 10), which show a process or spike at the base in each case. Whether the smooth forms are younger or precede the barbed bristles is unknown, but those emerging from the surface and

the shorter forms are smooth. The barred bristles (Pl. VIII. fig. 11) offer no diagnostic feature.

The specimen seems to agree with the description given by Prof. Ehlers of the head and anterior end of *Nephthys buccera*, but the structure of the foot diverges, since he states that the dorsal lamella has its long diameter perpendicular to the foot (forming an oval membranous plate), whereas the long diameter here is horizontal. Moreover, the capillary bristles have the larger spikes at the flattened region beyond the shaft characteristic of *N. picta*, though they are not so pronounced as in Ehlers's figure. The dorsal lamella of the latter (foot) would appear to be scarcely so long as the division and uniformly rounded. The dorsal cirrus in the Canadian form has a flat enlargement at its base superiorly. Unfortunately Ehlers gives no figure of the foot, so that some doubt remains.

EXPLANATION OF THE PLATES.

PLATE VII.

- Fig. 1.* Typical foot of *Nephthys canadensis*, with peculiar parasitic bodies attached. Enlarged.
Fig. 2. Foot of *Nephthys lawrencii*. Enlarged.
Fig. 3. Head and anterior segment of *Nephthys picta*, Ehlers, from the dorsum. Enlarged.
Fig. 4. Ventral aspect of the same region. Enlarged.
Fig. 5. Foot of the same species. Enlarged.
Fig. 6. Partly extruded proboscis of *Nephthys (Aglaophanus) inermis*, Ehlers. Enlarged.
Fig. 7. Foot (about the 90th) of the foregoing. Enlarged.
Fig. 8. Proboscis of *Nephthys picta*. Enlarged.

PLATE VIII.

- Fig. 1.* Barred or camerated bristle of *Nephthys (Aglaophanus) inermis*, Ehlers. Magnified.
Fig. 2. Lyrate bristle of the same species. Magnified.
Fig. 3. Simple bristle of the same form. Magnified.
Fig. 4. Barred bristle of *Nephthys canadensis*, sp. n. Magnified.
Figs. 5, 6. Simple serrated bristles of the foregoing. Magnified.
Fig. 7. Barred bristle of *Nephthys lawrencii*, sp. n. Magnified.
Fig. 8. Simple finely serrated bristle of the same. Magnified.
Fig. 9. Serrated bristle of *Nephthys picta*, Ehlers.
Fig. 10. Inferior region of the blade of the foregoing, more highly magnified.
Fig. 11. Barred bristle of the same species. Magnified.