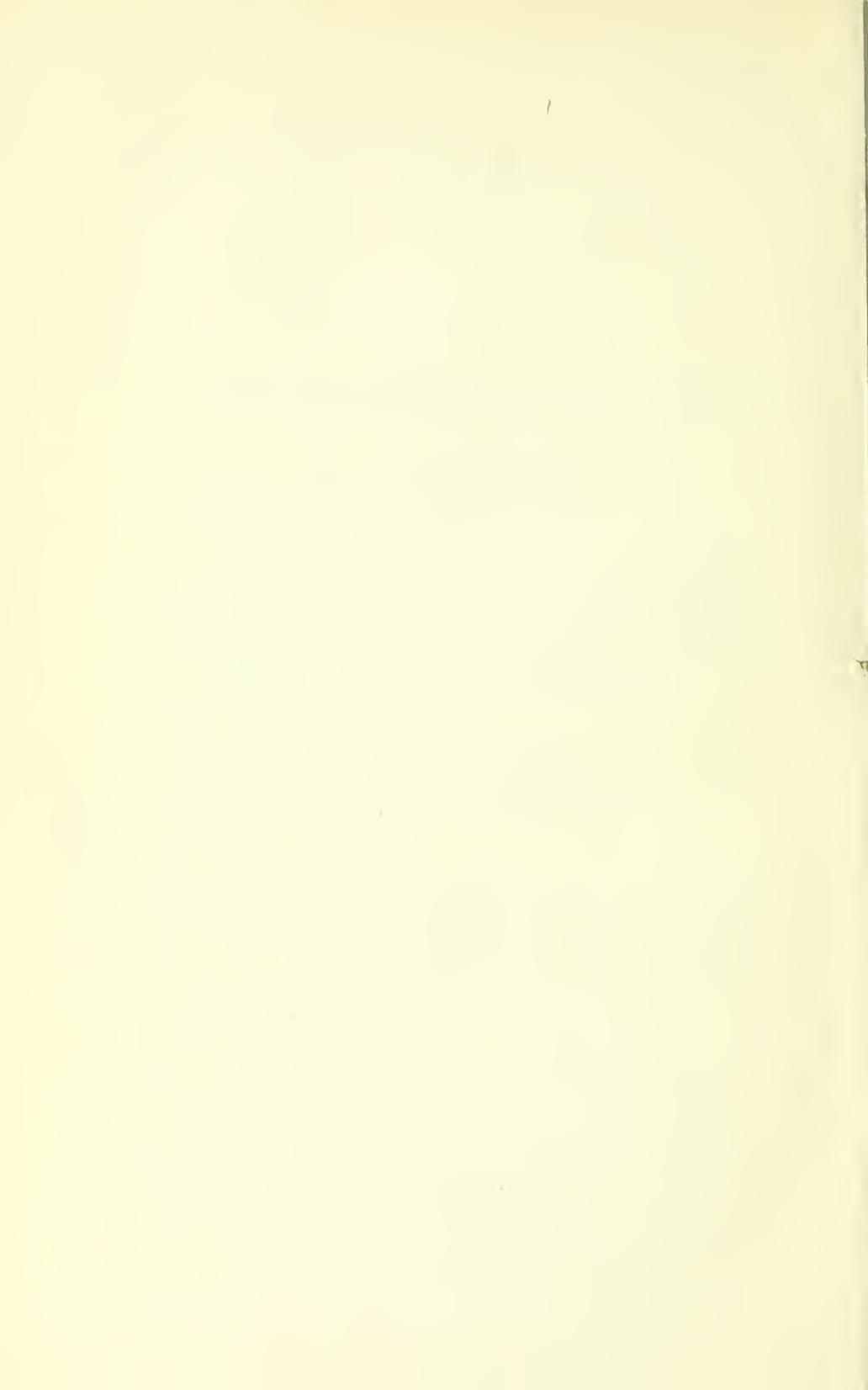

PART VII.

ANNELIDA FROM BERMUDA,

COLLECTED BY G. BROWN GOODE.

BY

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ANNELIDA FROM BERMUDA.

Fam. AMPHINOMIDÆ.

HERMODICE *Kinberg.*

Öfvers. Kong. Vetensk-Akad. Förhand., p. 11, 1857.

HERMODICE CARUNCULATA *Kinberg.*

(Plate VII, Figs. 1-5.)

- Nereis gigantea* LINNÆUS. Syst. Nat. ed. 12, vol. i, p. 1086. 1776 (teste Baird).
Aphrodita carunculata PALLAS. Miscell. Zoöl. p. 102, pl. viii, figs. 12, 13. 1766 (teste Quatrefages).
Terebella carunculata GMELIN. Linn. Syst. Nat., vol. i, p. 3113. 1789.
Amphinome carunculata BRUGIÈRE. Enc. Méth., art. Amphinome, p. 46. Atlas, pl. 60, figs. 6, 7. 1789 (t. Baird).
Amphinome carunculata CUVIER. Dict. des Sci. Nat., art. Amphinome, vol. ii, p. 72.
Amphinome carunculata GRUBE. Fam. der Ann., pp. 40 and 122. 1851.
Amphinome carunculata QUATREFAGES. Hist. Nat. des Ann., vol. i, p. 395. 1865.
Amphinoma carunculata AUDOUIN ET M. EDWARDS. Littoral de la France, vol. ii, p. 123. 1834.
Pleione carunculata SAVIGNY. Syst. des Ann., p. 61.
Pleione carunculata LAMARCK. An. sans Vert. 1st ed., vol. v, p. 330; 2d ed., vol. v, p. 572 (t. Baird).
Pleione carunculata CUVIER. Règne Animal, vol. iii, p. 199, ed. Crochard, Annélides pl. 8, figs. 4, 4 A.
Pleione carunculata GRUBE. De Pleione carunculata. 1837.
Pleione carunculata TREVIRANUS. Beob. aus der Zoöl., p. 53, pl. xi. 1839.
Hermodice carunculata KINBERG. Öfvers. Kongl. Vetensk-Akad., p. 13. 1857.
Hermodice carunculata BAIRD. Linnean Society, Journal, Zoöl., vol. x, p. 219, pl. iv, figs. 3 a, b. 1868.

There is a series of short flattened setæ along the anterior margin of the ventral ramus, from ten to fifteen in number, which seems not to have been observed.

The dorsal setæ are quite long, very delicate, simple, capillary.

The ventral setæ are much shorter than the dorsal, differ much in length, diameter, and number of teeth found along their outer third.

Some are bluntly rounded and curved at the apex; others have a single blunt tooth just back of the apex, on the side opposite the series of teeth.

EURYTHOË *Kinberg.*

Öfvers. af Kongl. Vetensk-Akad. Förhandl., p. 13. 1857.

EURYTHOË MACROTRICHA Baird.

(Plate VII, Figs. 6-9.)

Amphinome macrotricha SCHMARDA. Neue Wirbell. Thiere, vol. i, part 2, p. 144, figs. a, b, c, in text, and pl. xxxiv, fig. 290. 1861.

Amphinome macrotricha QUATREFAGES. Hist. Nat. des Ann. vol. i, p. 406. 1865.

Eurythoë macrotricha BAIRD. Linnæan Society, Journal, Zoöl., vol. x, p. 225, pl. iv, figs. 5 a, b. 1868.

Schmarda's description of this species is very short, and I am without information as to the original color of the specimens sent me. The reference, however, is probably correct. On the anterior margin of the ventral ramus is a series of short, flattened setæ, 6 to 9 in number (Fig. 9). The ventral setæ are not so much curved externally as in Schmarda's figure.

The collection includes a single specimen belonging to this family, too much injured for identification.

Fam. CHRYSOPETALIDÆ.

BHAWANIA *Schmarda.*

Neue Wirbellose Thiere, vol. i, part ii, p. 164. 1861.

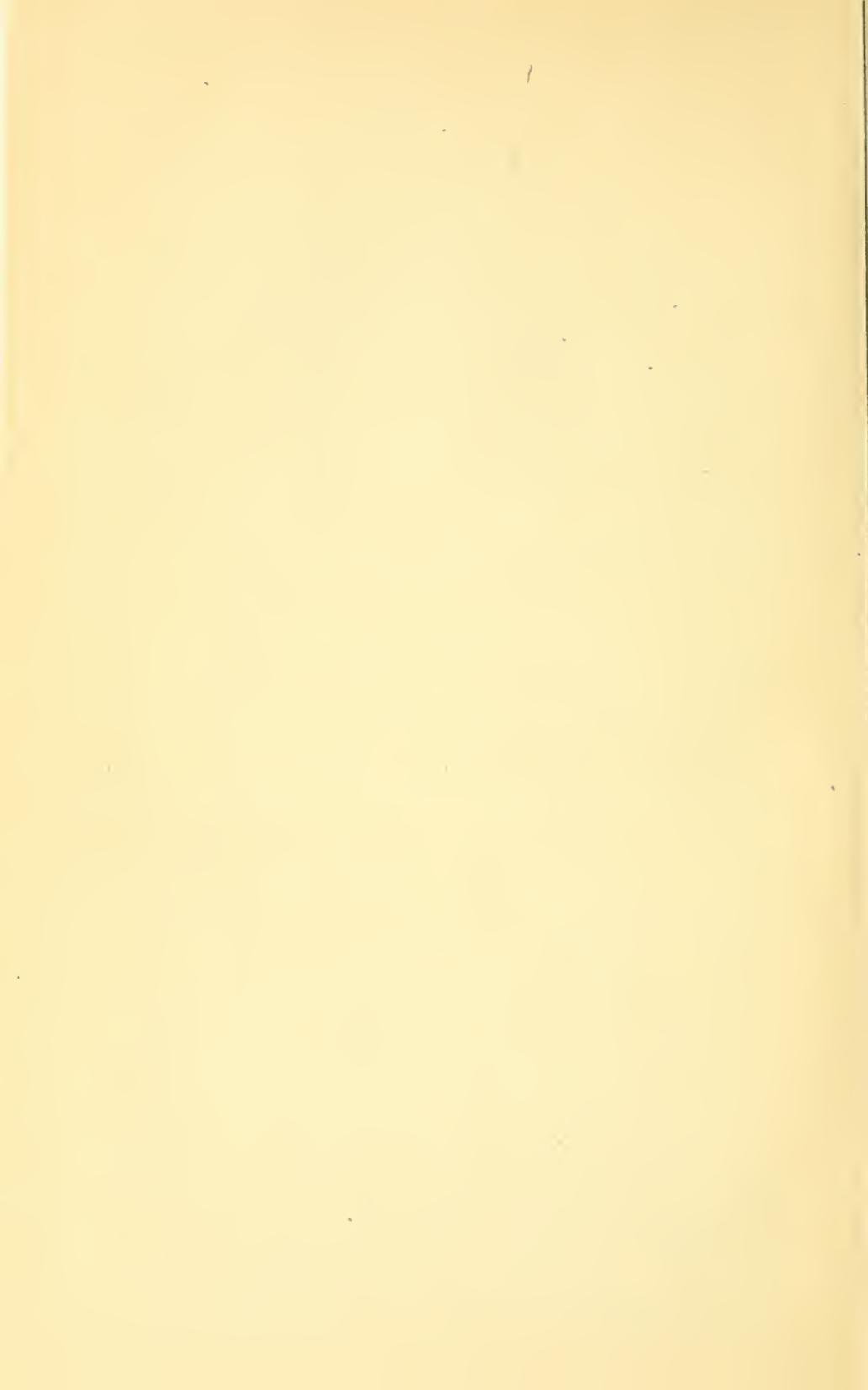
BHAWANIA GOODEI *n. sp.*

(Plate VII, Figs. 10-15.)

No good view of the head was obtained. The anterior segments curve directly forwards, embracing the head and reaching beyond it; palæ and setæ both projecting far beyond it, and in alcoholic specimens it seems impossible to free the head from the surrounding parts.

On the ventral surface there is an oval caruncle reaching through five segments, its length about double its breadth.

The palæ (Fig. 10) are broadly rounded externally, sides slightly convex, attached by a long narrow process. The inner edge is denticulated to near the end. The surface is covered by numerous longitudinal raised lines, of which three are wider than the others. All these lines, except the outer one of the wide lines, are covered with raised scales, which are very numerous and small on the narrow lines, presenting, when moderately magnified, the appearance of series of beads. The external wide band is smooth. Some of the raised lines are continued on the insertion plate. The palæ are very numerous; from the middle line of each lateral half of the body they curve—the external, outward; the internal, inward. Fig. 10 represents one of the palæ taken from about



the middle line of the body; passing from this line outward they become somewhat narrower.

Feet biramous; ventral ramus (Fig. 12) a little longer than the dorsal, curved upward, tapering slightly from base to apex, bluntly rounded externally. It carries a finger-shaped cirrus which originates near the base of the ramus. Dorsal ramus (Fig. 11) somewhat conical, truncated externally, and bearing a short cirrus, which arises near the center of the truncated surface. The two rami are very close to each other. Setae of the ventral ramus of two kinds, both compound; in the upper part of the bundle from two to six, elongate (Fig. 13), delicate, with long capillary appendix; all the others much shorter (Fig. 14), stouter, with short appendix. Setae of dorsal ramus (Fig. 15) from ten to fifteen in number, all of one kind, thin, pointed, flattened, widest near the center; they arise from the upper side of the ramus. The anterior segments curve forwards, forming semicircles. All the segments are very narrow. After the fifth segment the body has a uniform diameter to the posterior third, after which it tapers uniformly to about one-half the greatest width. The falling off in width is also rapid along the first five segments.

Color, in alcohol, pale light-yellow; ventral surface yellowish, or reddish-brown.

Body slightly convex above; flattened below.

Length (largest specimen), 50^{mm}.

Width, 3^{mm}.

Specimen only 10^{mm} in length were also 3^{mm}, or even 3.5^{mm}, in width.

Fam. POLYNOIDÆ.

HALOSYDNA *Kinberg.*

Öfversigt Kongl. Vetensk-Akad. Förhand., p. 384. 1855.

HALOSYDNA LEUCOHYBA (*Schmarda.*)

(Plate VII, Figs. 16-18. Pl. VIII, Figs. 19, 20.)

Polynoë leucohyba SCHMARDA. Neue Wirbellose Thiere, vol. i, part ii, p. 153, figures in text a, b, c, pl. xxxvi, fig. 308. 1861.

Polynoë leucohyba QUATREFAGES. Hist. Nat. des Ann., vol. i, p. 251. 1865.

? *Antinoë leucohyba* BAIRD. Linnean Society, Journal, vol. viii, p. 193.

The width of the head, back of the bases of the antennæ, exceeds the length (Fig. 16). The head is slightly convex above, with a central depression extending about one-half of the way back from the anterior margin; sides strongly convex; posterior margin straight; bases of the lateral antennæ as long as the rest of the head.

There are, probably, four eyes, but in the alcoholic specimens only two could be seen; these were lateral, circular, large, on the median line.

Antennæ smooth, cylindrical to near the apex, then tapering suddenly; median antenna about one-third longer than the lateral.

Superior tentacular cirrus about equal in length to the median antenna; inferior cirrus as long as the lateral antennæ.

Palpi triangular, stout, tapering uniformly to near the end, terminating in a small conical process; their margins are scalloped, and their surfaces thrown into folds by deeply impressed lines; length about that of the lateral antennæ.

There are eighteen pairs of elytra. (Schmarda gives seventeen in the text; in the figure, seventeen on one side, eighteen on the other). The first pair, circular; the others, oval (Fig. 18); slightly emarginate along the anterior margin; covered with small, white, rounded papillæ on their exposed surface, becoming more numerous on the posterior elytra.

The feet are quite stout; dorsal ramus (Fig. 17) minute; ventral ramus divided into two parts by slight longitudinal constrictions; dorsal cirri arising from stout basal articles, reaching a little beyond the ventral setæ; ventral cirri of first pair as long as the dorsal cirri, and similar to them in all respects, directed forwards. After the first pair they arise from minute basal articles, are fusiform, reach to the end of the ventral ramus.

There are from 6 to 10 dorsal setæ (Fig. 20), short, acute, broad at base, transversely serrate. Ventral setæ (Fig. 19) stout, bi-dentate, except those of the first segment, which end in a single point. They are in two bundles, but are all of one kind.

Exposed part of elytra, blue; covered part, grayish-white; papillæ of elytra, white; body, beneath the elytra, blue; anterior part of head and bases of elytra, blue; posterior part of head with numerous black pigment spots; feet and ventral surface, yellowish-white; dorsal cirri with a blackish band near the base, and another about two-thirds of the way out.

I refer the specimens sent me by Mr. Goode to *Polynoë leucohyba* SCHMARDA, though it will be seen that the figures differ, especially those of the setæ. Baird has doubtfully referred this species to *Antinoë* KINBERG, but Fig. 16 shows that it cannot be so referred. Schmarda says nothing about the head.

Fam. HESIONIDÆ.

FALLACIA *Quatrefages*.

His. Nat. des Ann., vol. ii, p. 98. 1865.

FALLACIA PROCTOCHONA (*Schmarda*) *Qtrfg.*

(Plate VIII, Fig. 21.)

Hesione proctochona SCHMARDA. Neue Wirbellose Thiere, vol. i, part ii, p. 79, figure of seta in text, and pl. xxviii, fig. 226. 1861.

Fallacia proctochona QUATREFAGES. Hist. Nat. des Ann., vol. ii, p. 99. 1865.

At first it seemed that it would be necessary to institute a new genus for this species. Afterwards two minute papillæ were found on the anterior angles of the head, which are doubtless rudimentary antennæ. As they are too small to be seen even with an ordinary hand magnifying glass, it is not surprising that Schmarda failed to mention them. Mr. Goode collected nine specimens of this species, and the museum of Union College has a large number of specimens, collected by myself on the west coast of Florida, from Sarasota Bay to Key West. Schmarda states correctly in the text that there are sixteen tentacular cirri; his figure shows but fourteen. These, like the dorsal cirri, arise from long cylindrical basal articles. From Schmarda's figure they would seem to arise in a linear series; in fact they are in pairs, one above the other. The basal article of the ventral cirri is very short. The upper margin of the foot (Fig. 21) is prolonged into a conical cirrus. According to my Florida notes the antennæ are red. It is impossible to determine from alcoholic specimens how many segments bear tentacular cirri, but there appears to be but one.

The ante-anal segment has no pedal rami, nor setæ, but merely two long cirri, dorsal and ventral.

The anal segment has two long anal cirri, as long as the dorsal cirri. The anal opening is surrounded by a series of low, flattened, projections, with convex external margin, oval in form, about six in number.

It would appear that Schmarda's specimens had lost the anal cirri.

PODARKE *Ehlers*.PODARKE OBSCURA *Verrill*.

VERRILL. Invert. Animals of Vineyard Sound, etc., p. 589, pl. xii, fig. 61. 1874.

WEBSTER. Annel. Chæt. of the Virginian Coast, p. 216. 1874. Annel. Chæt. of New Jersey, p. 107. 1880.

The collection contains a few specimens much injured, but probably belonging to this species.

Fam. NEREIDÆ.

NEREIS *Cuvier*.NEREIS BAIRDII, *n. sp.*

(Plate VIII, Figs. 22-28.)

The head of this species (Fig. 22) is quite long, the anterior thirds set off from each other and bounded by lines curving inward; the posterior third with convex sides; posterior margin straight.

Eyes not very large, circular, lateral.

Antennæ about one-half as long as the head, removed from each other, at origin, by less than their own diameter; inserted in slight depressions of the anterior margin of the head; bluntly conical.

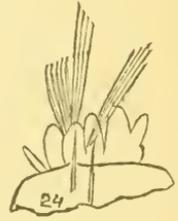
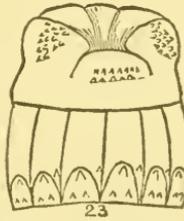
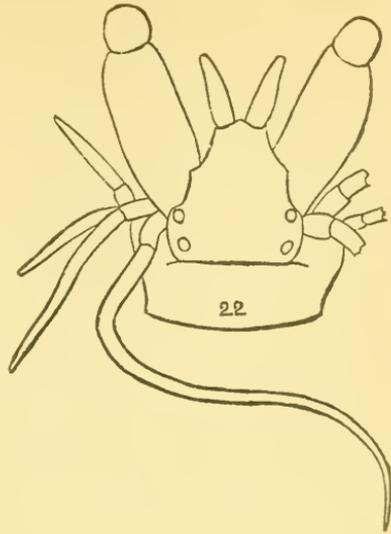
Palpi very long, not large, not tapering, with large terminal articles, which, in alcoholic specimens, are nearly spherical.

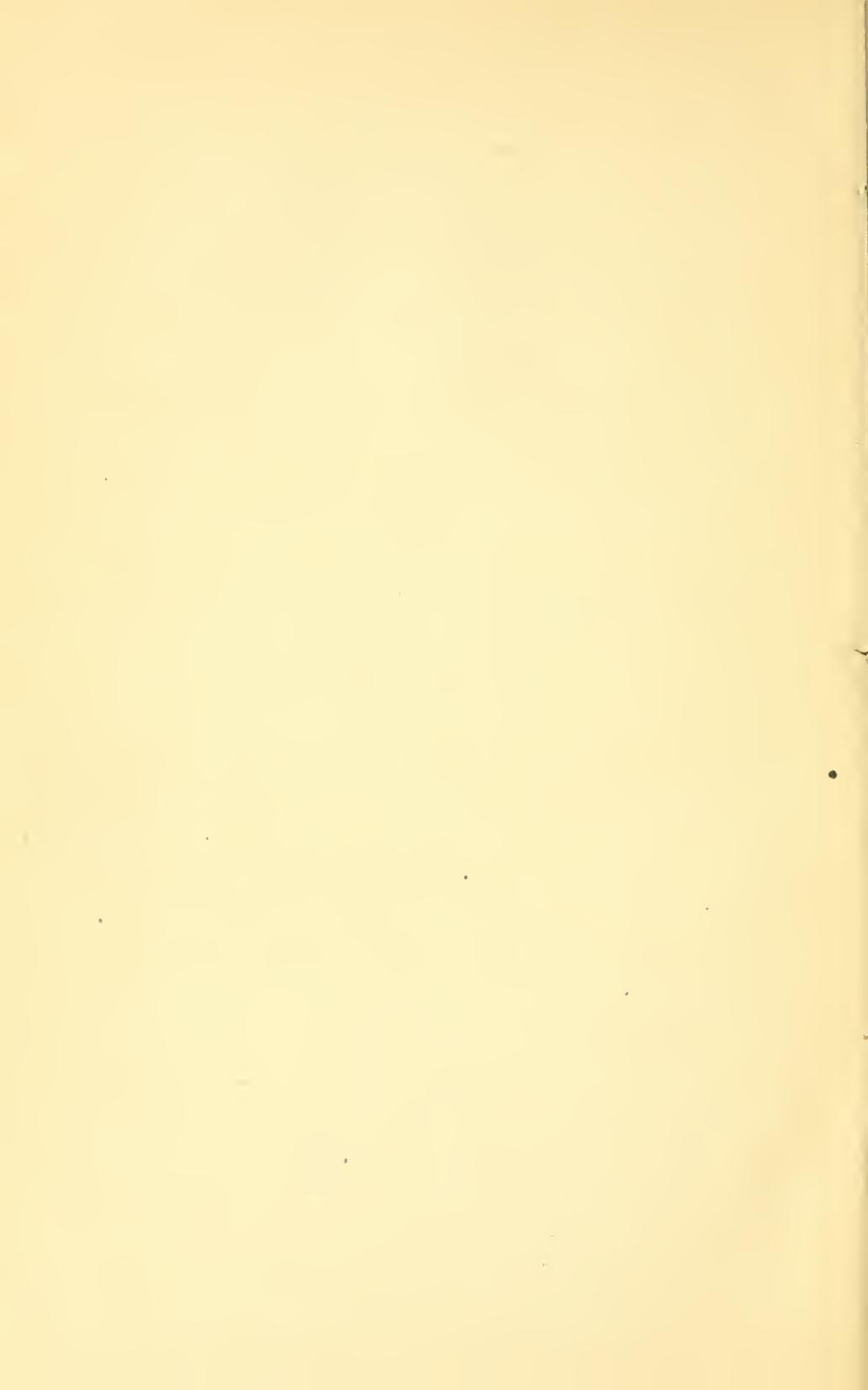
The buccal segment, in contracted specimens, has the same length as the second segment; probably double that length in life.

The maxillary ring of the proboscis is short (Figs. 22^a, 23); the paragnathi are complete; mostly conical; arrangement, i, irregularly V-shaped; ii, double series, irregular; iii, two transverse, linear series; iv, numerous, irregular; v, sometimes wanting, sometimes one, two, or three, small; vi, on each side a single, narrow, elongated transverse denticle, ends rounded; situated on elevations (Fig. 22) which have straight inner margins; outer margins straight to near the anterior end, when they curve inward; vii and viii in two series, the anterior composed of a few large denticles, the posterior more numerous and smaller.

Tentacular cirri with stout cylindrical basal articles; the cirri themselves delicate; the posterior superior longest, reaching back to the eighth segment; the others much shorter, as shown in the figure.

Feet rather stout and short; on the anterior segments (Fig. 24) the lingulæ and rami are nearly of the same length, stout, conical. Dorsal cirrus arising from the upper margin of its lingula, stout, conical, not reaching quite to the end of the lingula. Ventral ramus bi-labiate; anterior lip a little longer than the posterior. Ventral cirrus arising just within the base of its lingula, delicate, finger-shaped, nearly as long as the lingula. Further back the feet undergo some changes. The superior lingula is enlarged (Fig. 25), the dorsal cirrus moves nearer the apex of its lingula, and on the extreme posterior feet becomes a little more delicate (Fig. 26.) The dorsal ramus becomes smaller, more sharply conical. The ventral ramus shortens, especially its anterior lip. The





ventral lingula retains its length but loses in diameter. The ventral cirrus remains unchanged. Other specimens, certainly belonging to this species, have the feet more delicate, the dorsal and ventral cirri a trifle longer. (Figs. 24^a, 26^a.)

Anal cirri filiform, as long as the last ten segments.

In the dorsal ramus there are from 6-10 setæ (Fig. 28) with long delicate appendix, the terminal points of the stem equally long. These setæ form the upper part of the ventral bundle, while its lower part is made up of falcate setæ, appendix short (Fig. 27), terminal points of stem very unequal in length.

Body convex above, slightly convex below; of nearly uniform width for the anterior three-fourths; tapering slightly along the posterior fourth, but appearing to retain a uniform diameter, on account of the lengthening of the feet. A few of the anterior segments also taper slightly.

Length, 35-50^{mm}.

Width, 3-4^{mm}.

Number of segments, 50-80.

NEREIS GRACILIS, *n. sp.*

(Plate IX, Figs. 29-35.)

Head wide (Fig. 29), slightly convex laterally and above, a little concave behind, produced in front to form the bases of the antennæ.

Eyes quite large, placed well in front; those on either side nearly in contact.

Antennæ with long cylindrical basal articles, produced from the head, just within the anterior eyes; they are long, conical.

Palpi long and stout, curved inward near the base; terminal articles quite long; in contracted specimens they fall a little short of the antennæ.

Proboscis and jaws not seen.

On the specimen figured, which was otherwise in good condition, the posterior superior tentacular cirri were both lost. On another specimen, much injured, this cirrus remained, and was found to be very long, reaching back to the thirty-fourth segment, being nearly three times as long as the anterior superior cirrus, which reaches to the twelfth segment; the inferior cirri are much shorter.

Buccal segment produced forward along its anterior margin, encroaching a little on the head; its length, in alcoholic specimens, is about that of the next segment.

The dorsal cirri are very long and delicate; they have a stout basal article, which, on the anterior segments, is merged in the base of the upper lingula (Fig. 30); further back the lingula has the appearance of arising from the base of the cirrus (Figs. 31, 32). The dorsal cirri increase in length gradually, backward, and appear to gain much more than they really do, owing to the shortening of the other parts of the foot.

On the anterior segments the free portion of the upper lingula (Fig. 30) is about one-third as long as the dorsal cirrus, delicate, conical. The upper ramus is as long as the free part of the upper lingula, but falls a little short of its apex; in form it is like the lingula. The ventral ramus is bi-labiate, the anterior lip much the longest, conical, and minute at extremity (Fig. 30); basal three-fourths stout, with strongly convex sides. The posterior lip is very broad, completely concealing the base of the anterior lip in a posterior view (Figs. 30, 32); sides nearly straight, apex bluntly and irregularly rounded. The inferior lingula is long, conical, swollen at base. The ventral cirrus arises some distance within the base of the ventral lingula, and reaches nearly to its apex; it is very delicate, conical.

There is a progressive diminution in size of all parts connected with the feet from before backward, with the exception of the cirri; the lingulae, especially, become much smaller, falling short of the rami; but the cirri elongate, the ventral cirrus finally reaching beyond both lingula and ramus.

The setae are of three kinds: those of the dorsal ramus for the most part with delicate capillary appendix; the points of the stem nearly equal in length (Fig. 33); with these, in the lower part of the bundle, a few falcate setae (Fig. 35); in the ventral ramus there are two bundles of setae; the upper bundle is composed mostly of setae with appendix similar to those of the first kind, but with one of the terminal points of the stem much longer than the other (Fig. 34); there are also a few of the other two forms; the setae of the lower bundle are mainly falcate (Fig. 35), with also a few similar to Fig. 34.

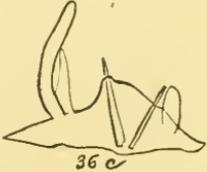
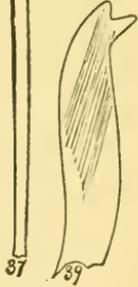
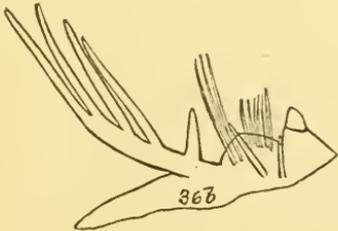
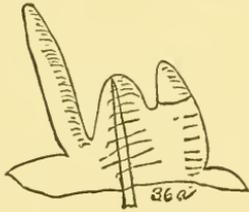
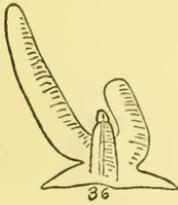
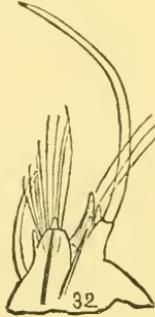
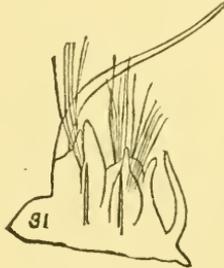
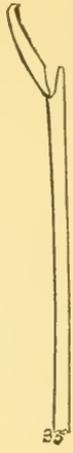
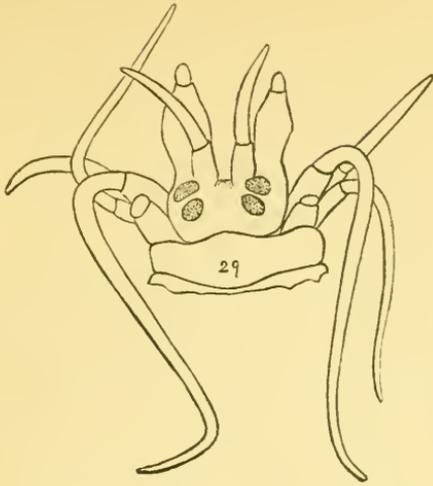
Anal segment simple, cylindrical; anal cirri as long as the dorsal cirri, and like them in all respects.

Body strongly convex above; slightly convex below; tapering a little along a few of the anterior segments, and also along the posterior third.

Length of only entire specimen, 60^{mm}.

Width, 4.5^{mm}.

Number of segments, 92.





Fam. EUNICIDÆ.

EUNICE *Cuvier*.EUNICE MUTILATA, *n. sp.*

(Plate IX, Figs. 36, 36a-d—40.)

This species is represented in Mr. Goode's collection by an anterior fragment composed of 39 segments, length 30^{mm}; and by a posterior fragment, 180 segments, length 90^{mm}. These may have belonged to the same specimen, but do not make up the whole of any specimen, an intermediate part, of unknown length, being lost.

The head is distinctly and deeply bi-lobed.

The antennæ rather delicate, cylindrical, smooth, bluntly rounded at apex; median antenna 3.5^{mm} in length, reaching back to the middle of the fifth (third setigerous) segment; inner pair, length 3^{mm}; outer pair a mere trifle shorter than the inner.

Eyes small, black, circular, between the bases of the paired antennæ.

Buccal segment equal in length to the three segments following it, taken together; second segment a little shorter than the third.

Tentaacular cirri as long as the buccal segment, conical, apex blunt.

The branchiæ begin on the seventh setigerous segment; on the seventh, eighth, and ninth segments, a single filament; on the tenth, eleventh, and twelfth, two filaments; on the thirteenth, fourteenth, and fifteenth, three filaments; from the sixteenth to the thirty-seventh, four filaments (Fig. 36*b*); on the posterior fragment the branchiæ have but a single filament (Fig. 36*c*), becoming very delicate and short on the posterior segments (Fig. 36*d*).

The dorsal cirri, largest on the first setigerous segment (Fig. 36), growing progressively smaller (Fig. 36*b*); at first finger-shaped, then conical. On the first segment of the posterior fragment this cirrus shows considerable increase in length, but is shorter than the branchia (Fig. 36*c*); while on the last segments (Fig. 36*d*), though the length of the cirrus is about the same, it is much longer than the branchia.

The ventral cirri are stout, conical, base swollen; outer third, on anterior segments, cut off by a shallow constriction; longest on first segments.

Anal segment cylindrical, small. Anal cirri short.

The upper (capillary) (Fig. 27) setæ are very long and delicate; longest on the posterior third. The comb-like setæ (Fig. 40) have their outer

teeth prolonged. The setæ of the lower bundle are compound, longer on the posterior segments than in front; apex (Fig. 38) bi-dentate.

In the anterior rami there is but one acicula, simple, pointed, projecting a little beyond the foot; afterwards a second acicula is added (Fig. 39), curved within the ramus, ventral, apex bluntly bi-dentate, projecting.

The body is strongly convex above, flattened below.

The width at the fifteenth segment, 5^{mm}; tapering very gradually in both directions, giving on the posterior segments a width of 1.5^{mm}.

The color, in alcohol, is light reddish-brown, with indications of a white band on the posterior half of the fourth setigerous segment. On the posterior segments the color is dark reddish-brown.

There are numerous gray specks on the entire surface.

EUNICE DENTICULATA *n. sp.*

(Plate X, Figs. 41, 41 a, b-45.)

Head distinctly bi-lobed; lobes flattened, broad; antennæ short, delicate, about one-third longer than the head, smooth, conical, equal.

Buccal segment about the length of the next three. Second segment not plainly separated from the buccal, when seen from above.

Tentacular cirri delicate, conical, about one-half the length of the buccal segment.

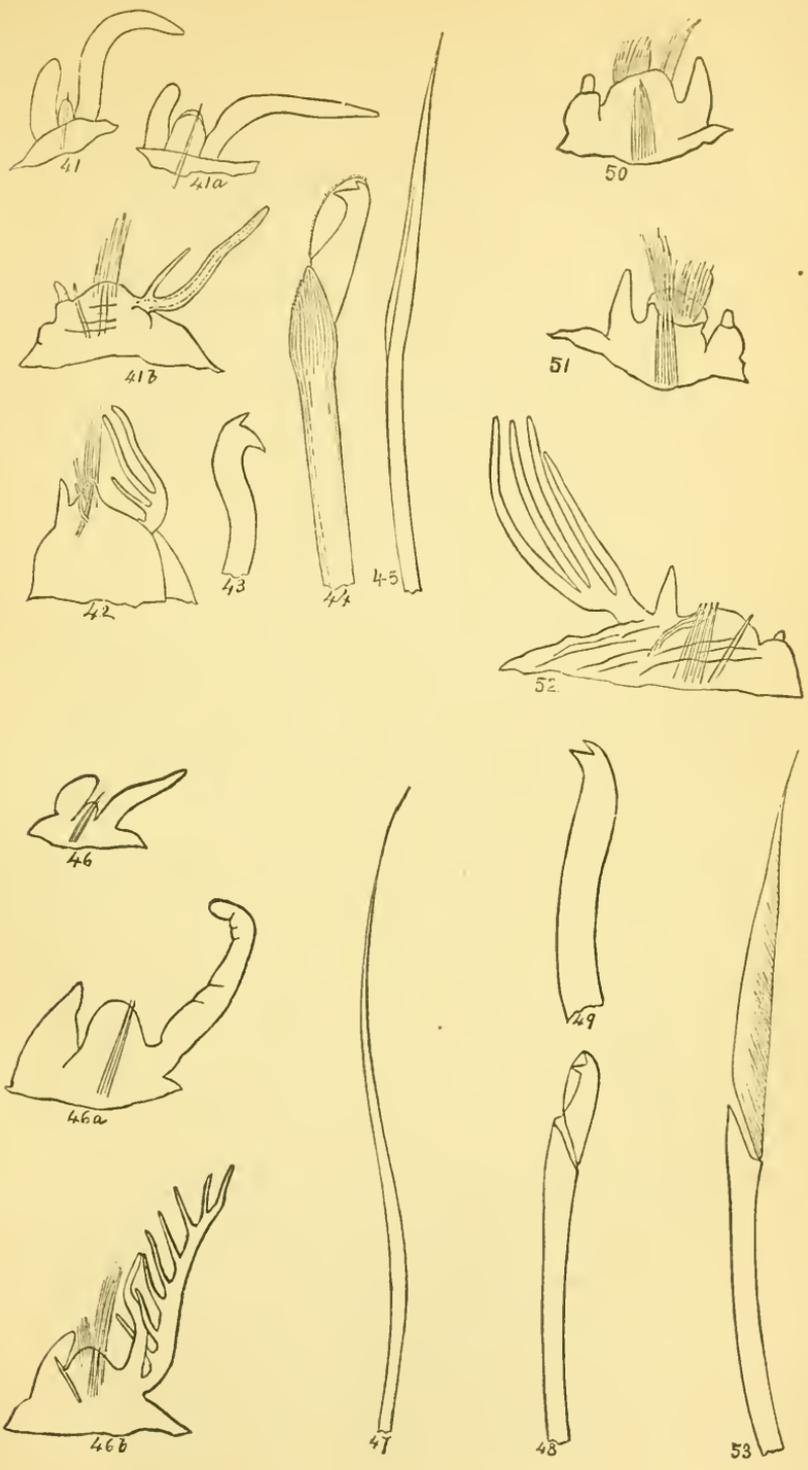
Dorsal cirri long and stout on the non-branched segments (Figs. 41, 41a), very delicate on the segments with branchiæ (Figs. 41b, 42), and arising from the side of the branchial stem.

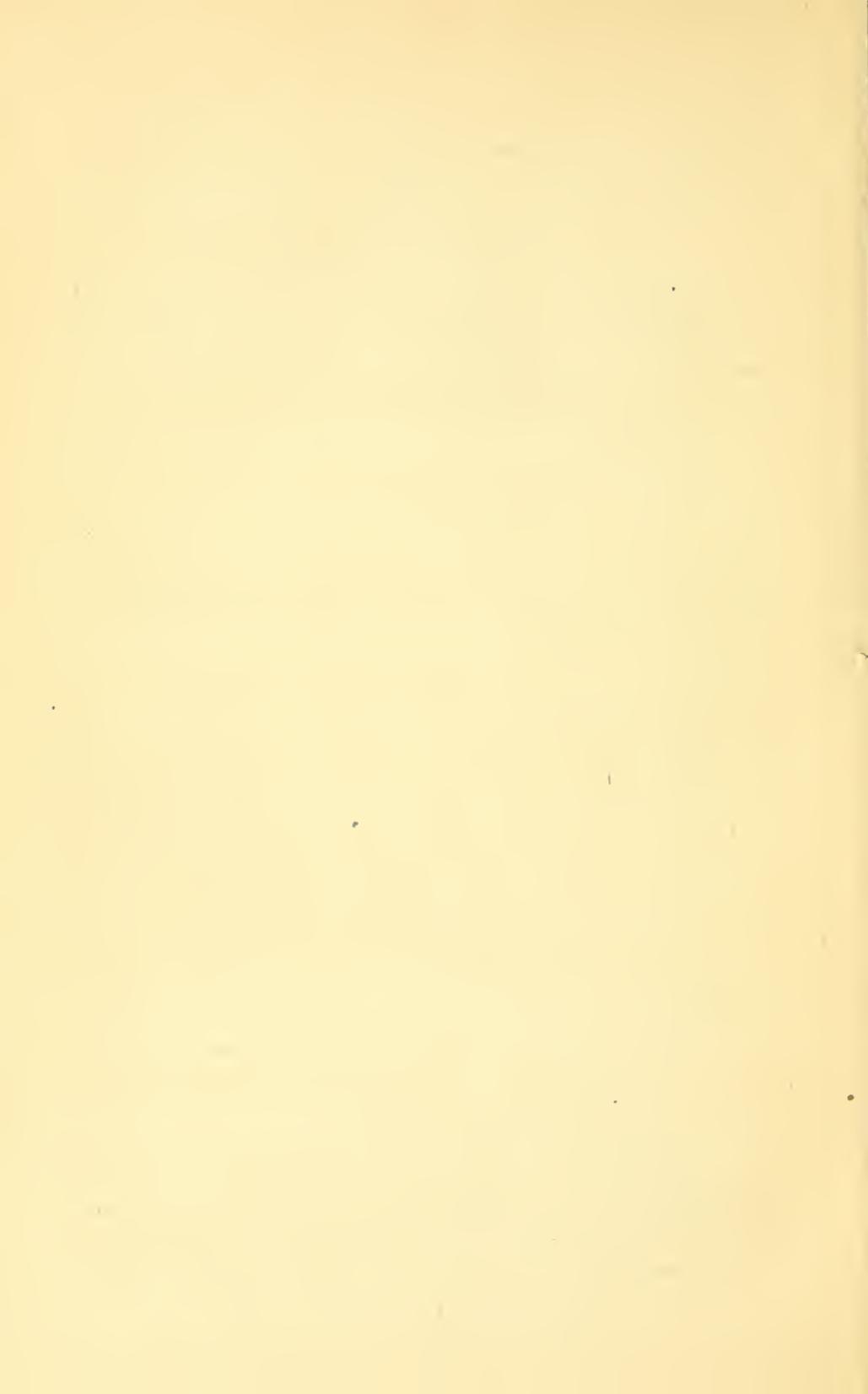
The ventral cirri are quite long on the anterior segments (Figs. 41, 41a); after the first few segments they have a swollen base (Fig. 41b), but this is lost further back (Fig. 42).

The branchiæ appear at about the middle third, and for a large number of segments consist of a single filament (Fig. 41b); at about the beginning of the last third another filament is added, while on the posterior segments there are three.

The capillary setæ (Fig. 43) have a long cylindrical inner part; a short, wide, flattened, outer part, tapering suddenly to a sharp point.

The compound setæ (Fig. 44) have a small, outer tooth; a large, stout, inner tooth. When highly magnified the stem shows a series of minute denticulations along one margin, near the appendix, and the membrane of the appendix shows an incised margin.





The lower acicula (Fig. 45) is curved externally, and has two sharp, triangular, teeth, of which the lower is very large.

Body slightly convex above, flattened below; segments numerous, short; on the largest specimen, at the widest part of the body, there were four segments, in a length of 1^{mm}.

Anal cirri lost on all our specimens. Color in alcohol, uniform yellowish-white.

Length of longest complete specimen, 60^{mm}.

Width, 3^{mm}.

Another specimen, posterior part lost, had a width of 4^{mm}.

The specific name is given in reference to the denticles on the stem of the compound seta.

EUNICE LONGISETIS *n. sp.*

(Plate X, Figs. 46, 46 a, b-49.)

Head four-lobed, upper lobes small; antennæ smooth, median and median lateral reaching back to the fifth segment; lateral about one-half as long as the median.

The dorsal cirri are long and stout (Figs. 46, 46a, b,) on the branchiated segments, arising just at the base of the branchial stem.

Ventral cirri stout, reaching beyond the foot. Branchiæ begin on the sixth setigerous segment, at first as a single filament, delicate, shorter than the dorsal cirrus; further back the number of filaments increases to eight, carried on the side of a stout stem, which is nearly double the length of the dorsal cirri; on the posterior segments they become reduced to the same condition as on the anterior, but persist to the end.

The capillary setæ are very long, reaching nearly to the end of the dorsal cirri (Fig. 47); the compound setæ are about one-half as long as the capillary, terminal teeth sharp (Fig. 48), nearly at right angles to each other.

In the upper part of the foot are two or three sharp aciculæ, projecting slightly; in the lower part, and extending into the ventral cirrus, a single, curved, bi-dentate acicula (Fig. 49).

Body convex above; flattened below; anal segment short; anal cirri two, in all respects similar to the dorsal cirri.

Color (in alcohol), dark reddish-brown. Fourth setigerous segment white. Antennæ, tentacular cirri, and dorsal cirri evidently banded with white and some other color in life, but with only slight traces of such marking remaining. Aciculæ black.

Buccal segment as long as the four following segments together; second segment short, not well defined above; tentacular cirri about one-half the length of the buccal segment.

Number of segments, 107.

Length, 40^{mm}.

Greatest width, 4^{mm}.

EUNICE LONGICIRRATA *n. sp.*

(Plate XII, Figs. 75-80.)

Head distinctly four-lobed; upper lobes narrow, but somewhat elongated. Median antennæ reaching back to the eleventh segment; median lateral also long, reaching to about the eighth segment; lateral about one-half as long as the last. They are all very delicate, smooth.

The buccal segment is as long as the next three segments. The second segment is nearly as long as the third, plainly set off from the first both above and below; its tentacular cirri are very delicate, acutely conical, reaching forward to the middle of the head.

The dorsal cirri on the anterior segments are large and long (Figs. 75-77), irregularly wrinkled; they diminish in size very gradually backward to the middle of the body; behind the middle they again gain in diameter and length, but are never so large as on the anterior segments.

The branchiæ begin as a single filament on the third setigerous segment (Fig. 76); on the next segment they have 6 subdivisions, on the next from 12 to 15. This number they retain to about the thirty-third segment; then for the next ten segments the filaments gradually become fewer; from about the forty-third to the fifty-third there is but one filament; after this they disappear. The branchiated segments form about one-third the length of the body.

The anal cirri are in two pairs; one quite short, blunt; the other as long as the last twelve segments taken together, every way similar to the antennæ.

The bidentate setæ have the form shown in Fig. 79; the outer tooth is quite long, bluntly rounded at apex; the lower sharp, triangular.

In the anterior segments there is one stout, projecting acicula, in the upper part of the foot; presently another is added; still further back a bi-dentate acicula (Fig. 80) appears, in the lower part of the foot, followed quickly by another of the same kind. Delicate setæ penetrate the base of the dorsal cirri.

The general color of the body (in alcohol) is yellowish-white; beautifully iridescent.

Body strongly convex above; flattened below.

Length (about), 110^{mm}.

Greatest width, 4^{mm}.

There is a gradual diminution of diameter along the posterior third.

EUNICE VIOLACEA Grube.

Eunice violacea, Grube. Annulata Örstediana p. 57. 1856.

Eunice violacea Quatrefages. Hist. Nat. des Annel., vol. i, p. 326. 1865.

Eunice Roussai Ehlers. Die Borstenwürmer, p. 309. 1868.

Ehlers' identification of *E. violacea* Grube with *E. Roussai* Quatr. seems at best very doubtful. In the former, the branchiæ appear on the sixth segment; in the latter, on the tenth, and both descriptions seem to have been made from adult forms. Our material is hardly sufficient to decide the question positively.

MARPHYSA Quatrefages.

MARPHYSA ACICULARUM n. sp.

(Plate X, Figs. 50-53.)

Head broad, distinctly bi-lobed; lobes very broadly rounded in front; antennæ smooth, tapering but little; median and median pair about three times as long as the head; lateral pair a little shorter than the last; eyes two, black, between the bases of the paired antennæ.

Buccal segment double the length of the following segment; second segment a trifle shorter than the third.

Dorsal cirri (Figs. 50-52) stout, conical, retaining about the same length throughout; ventral cirri on the anterior half of the body borne on a stout cylindrical process, which becomes smaller on the posterior part of the body.

The branchiæ begin (on adult specimens) on the twenty-fifth to twenty-ninth setigerous segment, at first as a single filament, shorter than the dorsal cirrus. The filaments soon increase in number to four (Fig. 52), but on the posterior segments become again reduced to one very minute filament.

The superior (capillary) setæ are about double the length of the inferior, and of the ordinary form. The form of the inferior setæ is shown in Fig. 53.

There are from three to five sharp, black aciculæ in each foot, scarcely projecting.

The first ten segments are rounded; their length a little more, their diameter a little less, than that of the segment following. After the tenth segment the body is much depressed; very slightly convex above, flat below; along the posterior third the body is somewhat more convex, and diminishes gradually in diameter.

Length, 120^{mm}.

Greatest width, 6^{mm}.

Color (in alcohol), dirty white, somewhat iridescent.

NICIDION *Kinberg*.

NICIDION KINBERGI *n. sp.*

(Plate XII, Figs. 81-88.)

This genus is represented in Mr. Goode's collection by a single specimen, of which the posterior segments are lost. What remained is in good condition, and it seems desirable to describe it, as well as may be, because so few species of the genus have been found.

The head (Fig. 81) is bi-lobed, convex above and at the sides; the median antenna reaching back to the third segment; the paired antennæ a little shorter than the median; eyes small, circular, black, situated back of the origin of the lateral antennæ.

The buccal segment is nearly as long as the three following segments together; the second segment perfectly well marked, as long as the third; the tentacular cirri were lost, merely a short basal part remaining.

The dorsal cirri on the anterior segments are stout, irregularly and bluntly conical (Figs. 82, 83); further back they become somewhat smaller (Fig. 84). The ventral cirri on a few of the anterior segments (Fig. 82) are as long as the dorsal, finger-shaped; soon they become much swollen at base (Fig. 83), and then fall off rapidly in size, being hardly perceptible on the posterior segments of our fragment (Fig. 84).

The capillary setæ are widened for a part of their length (Fig. 86), and then drawn out into a delicate capillary termination. The compound setæ have the form shown in Fig. 85. There are many comb-like setæ (Fig. 87), with their teeth curved and prolonged, especially one of the outer teeth.

In the anterior feet there is a single stout acicula, straight, pointed, slightly projecting; further back appears a bi-dentate acicula, in the lower part of the ramus (Figs. 84, 85).

Body strongly convex above, flat or slightly concave below.

Color, in alcohol, white.

Length of seventy segments, 14^{mm}.

Diameter, 1.2^{mm}.

ARABELLA (*Grube*) Ehlers.

ARABELLA OPALINA Verrill.

Lumbriconereis splendida LEIDY. Marine Invert. Fauna of R. I. and N. J., p. 10. 1855.

Lumbriconereis opalina VERRILL. Invert. Animals of Vineyard Sound, in Report of U. S. Commissioner of Fish and Fisheries, Part II, p. 342, pl. xiii, figs. 67, 70. 1874.

Arabella opalina VERRILL. Proc. Acad. Nat. Sci. Phila. for 1878, p. 299.

Arabella opalina WEBSTER. Annel. Char. of the Virginian Coast, etc., p. 242. 1879.
Annel. Char. of N. J., p. 116. 1880.

This species, on our coast, certainly ranges as far north as Cape Cod, and as far south as Beaufort, N. C.

CENONE (*Savigny*) Ehlers.

CENONE DIPHYLLIDIA Schmarda.

Plate XII, Figs. 89-91.

Cenone diphyllidia SCHMARDA. Neue Wirbel. Thiere, vol. i, part ii, p. 120, pl. xxxii, fig. 256 (also figures in text). 1861.

Andromache diphyllidia KINBERG. Annulata Nova, p. 571. 1865.

Cenone diphyllidia QUATREFAGES. Hist. Nat. des Ann., vol i, p. 374. 1865.

Cenone diphyllidia EHLERS. Die Borstenwürmer, p. 407. 1868.

In preserved specimens the "frontal tentacles" of Schmarda (Mundpolster, Ehlers) are hardly visible.

The anterior feet with all their appendages are shorter and wider than those further back (Fig. 90). After the first few segments there may be from one to three stout bi-dentate setæ in the lower part of each ramus.

Ehlers' remarks upon this genus and species seem to be accurate in every respect.

Fam. ARICIIDÆ.

ANTHOSTOMA Schmarda.

Anthostoma ramosum SCHMARDA. Neue Wirbellose Thiere, vol. i, part ii, p. 62 (figs. of feet and setæ in text).

The collection contained but one specimen of this species, and that very badly injured, but sufficient for identification.

Fam. OPHELIIDÆ.

OPHELINA Örsted.

Grube, in his *Annulata Semperiana* (p. 193), arranges the genera of this family in the following manner :

Ophelina ÖRSTED; type, *Ammotrypanne aulogaster* RATHKE.

Ammotrypane RATHKE; type, *Ammotrypane limacina* RATHKE.

Ophelia SAVIGNY; type, *Ophelia bicornis* SAVIGNY.

This arrangement seems to be correct, and accordingly the following species has been referred to *Ophelina*.

OPHELINA MACULATA *n. sp.*

(Plate XI, Figs. 54, 55.)

Head as long as the first three segments taken together, terminating in a delicate, elongated, conical process, which is set off by a shallow constriction.

There are three eyes, forming a transverse series, near the posterior margin of the head, very small, the middle one largest. The first segment is quite short; from the first to the seventh the segments increase gradually in length; after the seventh they are of uniform length, except the last four, which are shorter.

The outline of the feet and relative length of the setæ are shown in Figs. 54, 55.

The branchiæ begin on the second segment; on all our specimens there are 24 pairs of branchiæ, with one exception, where there are 24 on one side, 25 on the other, leaving three non-branchiated setigerous segments. It is possible that the branchiæ have been lost from some or all of these segments, as we have but few specimens, and in all the posterior segments are somewhat injured.

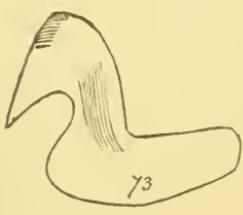
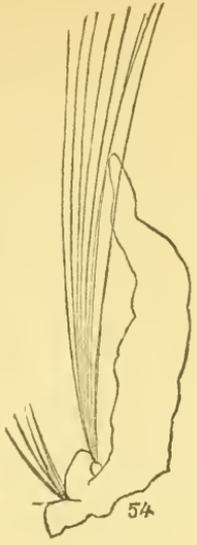
The branchiæ are densely ciliated.

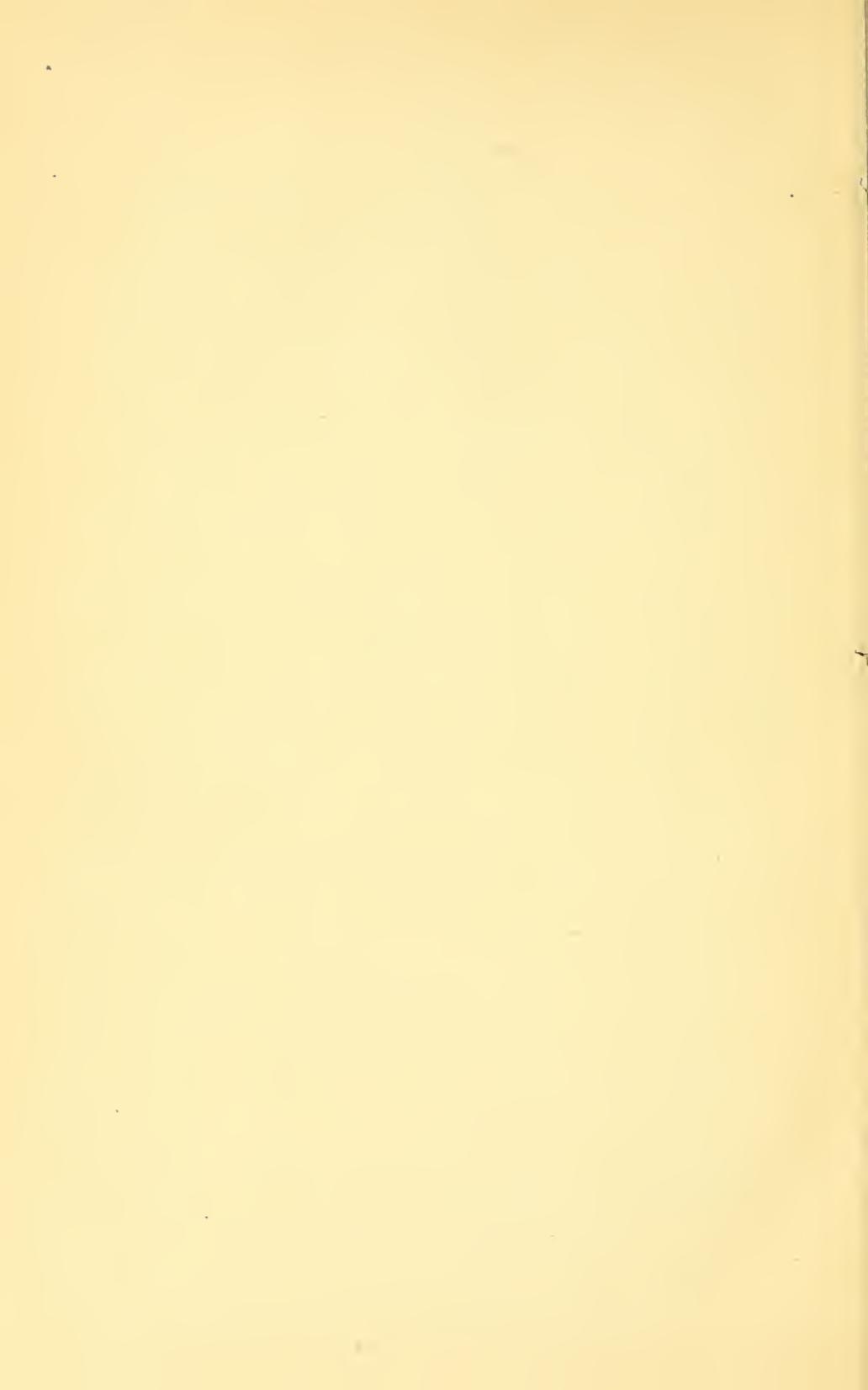
On the seventh segment a circular black spot appears on the side of the segments, close to the origin of the branchiæ. These spots are found on eleven segments; they then become elongated, narrow, and presently disappear.

The general color (in alcohol) is pearl-gray. In every case the anal segment is too much injured to admit of determining the number of the papillæ. A few of them are bi-furcate at extremity.

Length, 19^{mm}.

Width, 2^{mm}.





Fam. THELETHUSIDÆ.

ARENICOLA *Lamarck.*ARENICOLA CRISTATA *Stimpson.*

STIMPSON. Proc. Boston Soc. Nat. His., vol. v, p. 114.

QUATREFAGES. Hist. Nat. des Ann., vol. ii, p. 673. 1865.

The posterior (non-branchiated) segments of this species are set off from each other by deep constrictions.

On the first segment, back of the branchiæ, the feet are represented by two stout conical cirri on either side, distant from each other by about the diameter of the base of each.

On the remaining nine segments there is but a single cirrus on each side, and these pass to the ventral surface, and stand close together.

Fam. CIRRATULIDÆ.

CIRRATULUS *Lamarck.*CIRRATULUS TENUIS *n. sp.*

(Plate XI, Figs. 56, 57.)

Head short, bluntly rounded in front; no eyes. First three segments without setæ or cirri. Third segment a little longer than the fourth; as long as the first two together.

Lateral branchiæ begin on the fourth segment, and exist, on the anterior third of the body, on all segments; not so numerous further back.

Dorsal branchiæ on the fifth, sixth, and seventh setigerous segments, two or three on each side of each segment; not forming a complete transverse series, but leaving a naked median space. Branchial cirri all long, not differing from each other.

The setæ of the anterior segments are capillary in both rami, long, delicate, 7-10 in each fascicle.

At about the fifteenth setigerous segment the ventral setæ begin to be replaced by uncini, and after a few segments the capillary setæ disappear. There are at first three of the ventral uncini; then two; while on the posterior segments there is but one to each ramus. At about the twentieth setigerous segment uncini appear in the dorsal rami; both kinds of setæ remain to the end.

The body is convex above, compressed, flattened below; segments very short but distinctly defined; from the middle the diameter decreases slightly, backward.

Number of segments, 110.

Length, 30^{mm}.

Diameter, 2^{mm}.

Fam. TERESELLIDÆ.

TEREBELLA (*L.*) *Malmgren.*TEREBELLA MAGNIFICA *n.*, *sp.*

(Plate XI, Figs. 58-60.)

The tentacles are very numerous, stout, three-fourths as long as the body, even in alcoholic specimens.

The branchiæ of the first pair are large and long (12^{mm}); of the second, one-half the first; of the third, one-half the second: the stem, before giving off branches, forms one-half the length. The branchiæ have numerous brown specks on their stems and branches.

Seven segments, beginning with the second branchiated, have a small, conical papilla or cirrus, placed between the two rami; there is a similar cirrus at a corresponding place on the first branchiated segment.

The ventral surface of the second segment is raised into a thin plate, on either side of the middle line, widening externally; a somewhat similar structure, but not so well marked, occurs on the third and fourth segments. Back of the fourth segment are the ventral plates, sixteen in number, of uniform width, their anterior and lateral margins thickened and separated by an impressed line from the body of the plate. The width of the first plate is five to six times its length; they become progressively narrower, until on the last plate the width and length are about equal. As the ventral plate becomes narrow the uneigorous tori widen.

An impressed line running just in front of the pedal rami divides each segment into two parts; very distinctly above, less so below.

The body retains a uniform diameter to the posterior sixth; after which it tapers somewhat rapidly, the diameter of the anal segment being about one-half that of the middle segments.

Length, 160^{mm}.

Diameter, 8^{mm}.

Number of segments on specimen measured, 135.

Color in alcohol, yellowish-white.

ENOPLOBRANCHUS *Verrill.*ENOPLOBRANCHUS SANGUINEUS *Verrill.*

Chatobranchus sanguineus VERRILL. Invert. Animals of Vineyard Sound, p. 616. 1874.

Enoplobranchus sanguineus VERRILL. Check-List.

Enoplobranchus sanguineus WEBSTER. Annel. Chat. of the Virginian Coast, p. 263. 1879.

The collection contains a few specimens, all much injured, certainly belonging to this peculiar genus, and probably also to Verrill's species.

Fam. SABELLIDÆ.

PROTULIDES *n. g.*

Branchiæ united along their inner part by membrane.

Setæ of first segment in an oblique double series. Uncini in two series and of two kinds on all segments. Anterior dorsal setæ of two kinds. Collar complete, save for a narrow dorsal incision; not reflexed. Ventral sulcus continued on the dorsum.

This genus is closely related to *Potamilla* MALMGREN, but differs from it in the character and arrangement of the setæ of the first segment, in the continuation of the ventral sulcus on the dorsum, and in having two rows of uncini on the abdominal segments.

PROTULIDES ELEGANS *n. g., n. sp.*

(Plate XI, Figs. 63-74.)

The branchial cirri are from nine to fourteen on each side, base forming a semicircle; they arise from a long undivided basal part, one-half as long as the cirri themselves; pinnæ elongate, delicate; short terminal part of the cirrus without pinnæ.

There are two series of minute eye-specks, one about two-thirds of the way out on the cirri, corresponding to the space occupied by six or seven pinnæ; another, still further out. These eyes cannot be seen in alcoholic specimens.

Tentacles flattened, triangular, length about one-fourth that of the branchiæ.

The first segment is double the length of the second, complete save for a narrow dorsal incision (Fig. 63).

There are from six to eight thoracic segments, the variation in number not depending on size, as some of the largest specimens have but six segments. Posterior segments short; numerous.

The setæ of the first segment are in two series, which run obliquely from before backward, along the entire length of the segment. All these setæ are dilated at the end, and have a capillary apex; they do not differ from each other much in form (Figs. 64-66); there are about forty setæ in each row; they barely project from the surface.

Setæ of remaining thoracic segments of four kinds: In the dorsal ramus, from 4 to 5 long bi-limbate setæ (Figs. 67, 68); below these a double series of short setæ, with dilated globular extremities (Figs. 69, 70) without capillary terminations. In the ventral ramus are the two

forms shown in Figs. 73 and 74; these are arranged in two long series. After the change of setæ (*i. e.*, on the abdominal segments) the uncinæ remain without modification (Figs. 73, 74); the ventral rami carry a few very long capillary setæ (Fig. 71), and others with dilated end, from the depressed summit of which arises a very delicate capillary appendix or apex (Fig. 72); further back both kinds of ventral setæ become somewhat elongated, and, in particular, the capillary termination of the setæ with expanded ends doubles in length.

The body is convex above, flattened below; of uniform width for the anterior four-fifths, falling off gradually along the posterior fifth to one-half the anterior width.

The base and cirri of the branchiæ are purple, except the base of the superior cirrus on each side, which is white; pinnae, to the outer margin of the connecting membrane, purple; then, for a short distance, white; next, for a longer distance, purple; followed by another short white series. Terminal pinnae, purple; naked terminal part of cirri, colorless. Where the pinnae are white the sides of the cirri are also white, but the dorsum of the cirri is always purple. Young specimens have the cirri amber-brown or brown, with a tinge of purple; pinnae colorless, white or greenish-white. The first segment has its anterior margin white; dorsum and sides dark amber-brown; ventral surface, for anterior two-thirds same as the dorsum, then a narrow white line, while the posterior part of this surface is dark flesh-color. Remaining thoracic segments, amber-brown; dorsal rami of this part of the body, dark flesh-color. Abdominal segments light flesh-color. On the anal segment two amber-brown spots (? eyes) which cannot be made out in preserved specimens.

This species forms a very tough membranous tube. The description given above is largely drawn from notes on specimens found at Beaufort, N. C., in 1876, by the Union College zoölogical expedition of that year. Most of the specimens found at Beaufort had their tubes imbedded in fragments of a soft oölite just below low-water mark. Two specimens were found with these tubes attached to shells.

A specimen with something over a hundred segments, measured while living, gave—

Length, 26^{mm}.

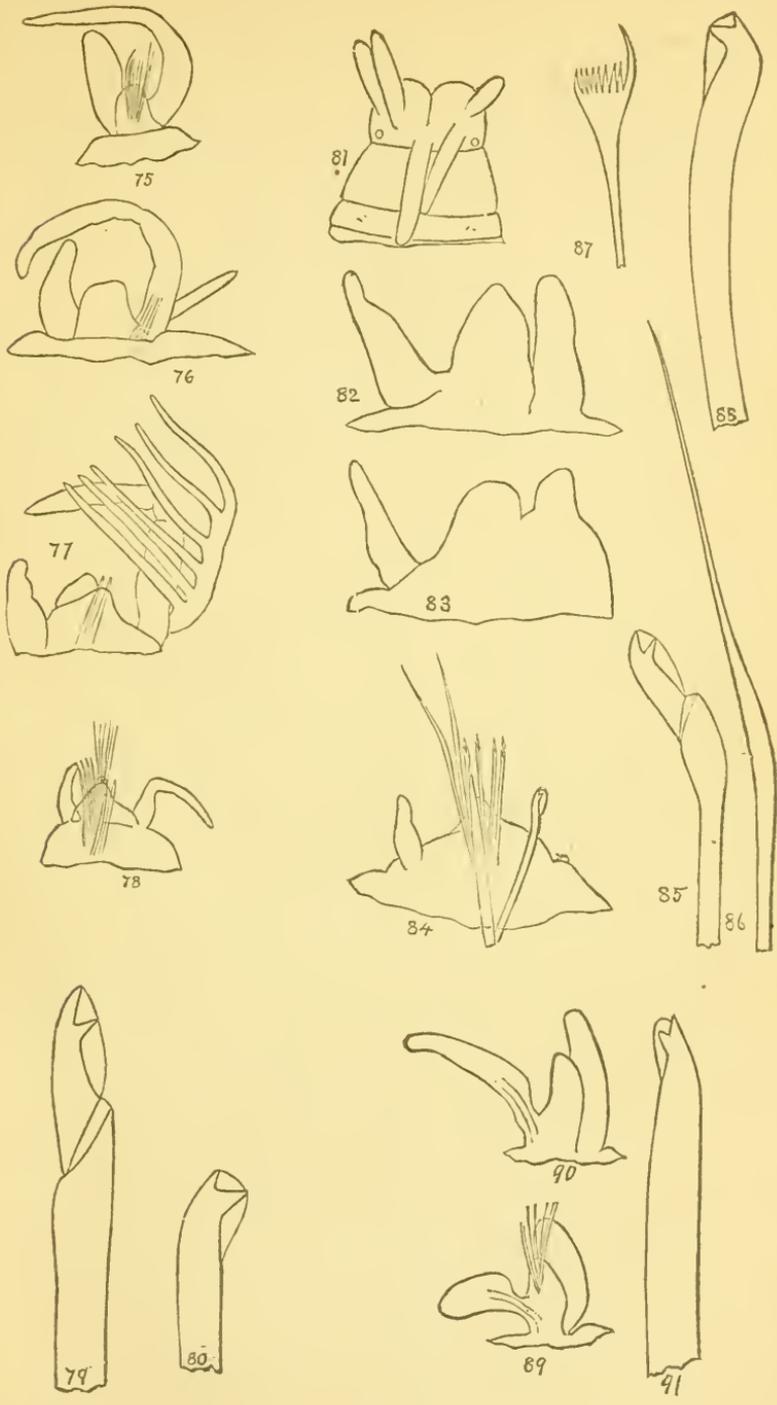
Breadth, 2^{mm}.

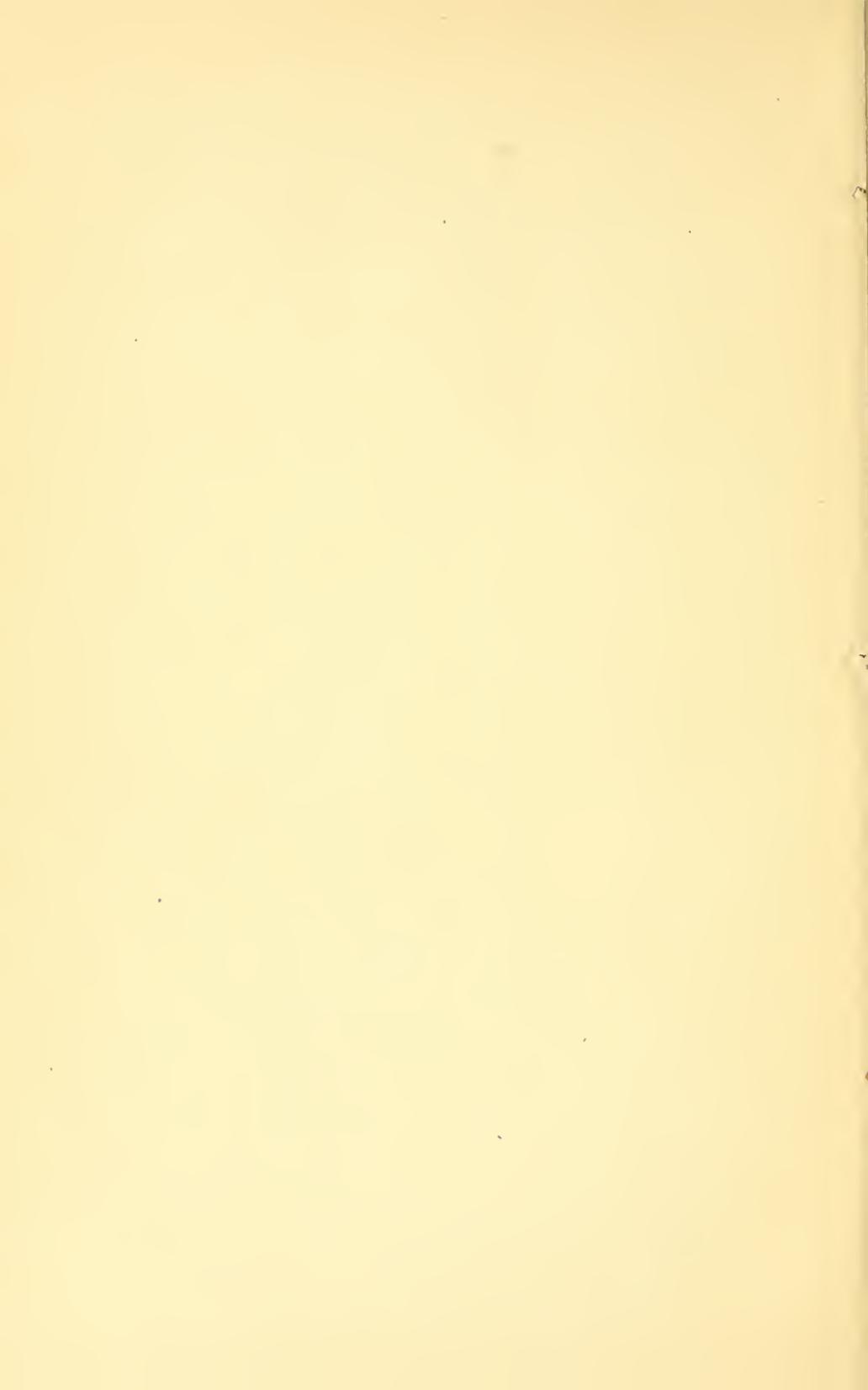
From front margin of collar to tip of branchiæ, 5^{mm}.

Another specimen:

Length, 50^{mm}.

Breadth, 35^{mm}.





SABELLA (*L.*) *Malmgren.*SABELLA MELANOSTIGMA *Schmarda.*

The collection contains a single specimen, without branchiæ, and otherwise injured, which probably belongs to Schmarda's species.

Fam. SERPULIDÆ.

HYDROIDES *Gunnerus.*HYDROIDES DIANTHUS *Verrill.*

Serpula dianthus VERRILL. Invert. Animals of Vineyard Sound, p. 620. 1874.

Hydroides dianthus VERRILL. Proc. Acad. Nat. Sci., Phila., for 1878, p. 300.

Hydroides dianthus WEBSTER. Annel. Chæt. of the Virginian Coast, p. 266. 1879; of New Jersey, p. 123. 1880.