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**Zoologische Jahrbücher.**

Jena [Germany] :G. Fischer,

<http://www.biodiversitylibrary.org/bibliography/8980>

**Bd. 10 (1898):** <http://www.biodiversitylibrary.org/item/38125>

Page(s): Page 1, Page 2, Page 3, Page 4, Page 5, Page 6, Page 7, Page 8, Page 9, Page 10,  
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# Descriptions of new Metanemerteans, with Notes on other species.

By

**Thos. H. Montgomery jr., Ph. D.**

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With Plate 1.

In his paper "The marine Nemerteans of New England" (in: Trans. Connect. Acad., V. 8, 1892), VERRILL has described a considerable number of new species, from various points along the eastern coast of N. A.; but this author had treated to very little extent the internal anatomy of these species. It is my purpose here to give brief anatomical notes on certain forms already described, with descriptions of two new genera and three new species of Metanemerteans.

The species treated of I collected at Newport, R.-I., and Wood's Holl, Mass., during the summer of 1895; and at Sea Isle, N.-J., during June of the present year. All these species are found on sea-weeds and stones at low water mark, or at the same tide level on the wooden piers of bridges, etc. I had no opportunity for dredging at greater depths, which accounts for the small number of forms annotated in this paper.

To Dr. ALEX. AGASSIZ, for the use of a table at his Newport laboratory; to the gentlemen in charge of the U. S. Fish Commission laboratory at Wood's Holl, and of the University of Pennsylvania laboratory at Sea Isle, I would express my thanks, for the opportunities for collecting, offered me at these institutions.



1. *Zygonemertes virescens* (VERR.) n. g.

= *Amphiporus virescens* VERR. (1892).

I have separated this species from the genus *Amphiporus* and placed it as the type and only known representative of a new genus, *Zygonemertes*, on account of the following peculiarities in its organisation:

1) The rhynchocoel extends to the posterior end of the body, while the thickened proboscis (with the exclusion of its retractor muscle) does not extend quite half the length of the rhynchocoel (Fig. 28). The basis of the central stilet (Fig. 24) is very large, considerably elongated, flattened or slightly concave posteriorly; the basis is constricted near its posterior end. The central stilet is straight, massive, not half the length of its basis.

2) Longitudinal nerves of the proboscis either 10 or 11 in number.

3) A few elongated subepithelial gland cells ("Cutisdrüsen"), which stain with haematoxylin, are situated in the head region.

4) Shape of body resembling an *Amphiporus*, not as elongate as in *Eunemertes*; also contractile as in the former genus.

5) Ocelli numerous, small, extending behind the brain on the dorsal and lateral aspects of the lateral nerve chords (Figs. 14, 15).

These five points give the diagnosis of the new genus; the following anatomical structures may also be noted:

Sensory hairs and pigment are wanting in the body epithelium.

The posterior commissure of the lateral nerve chords, is situated at the end of the body, above the intestine.

In the body epithelium, between its constituent cells, lie peculiar, curved bodies (Fig. 23), larger at one end than at the other, refractive, hard, brittle, of a yellowish-green color, and which do not stain with the reagents used. They have a close resemblance to the bodies found in *Eunemertes echinoderma* (MARION), from which they differ only slightly in form; they are always present, and being easily recognized with low powers of the microscope, present a good characteristic for determining the species. I conclude that these peculiar bodies are of extraneous origin, since there are no special cells in the epithelium for producing them, nor do they present differences in dimensions and form — differences which we would expect to find, were they developed within the epithelium.

The central stilet of the proboscis has been already noticed;



the lateral stilets are contained in the two lateral pockets, usually two stilets in each. In only 1 case (out of at least 100 individuals examined) were 4 lateral pockets present.

The oesophagus empties into the rhynchodaeum. The anterior portion of the latter is ciliated, and opens ventrally at the anterior end of the head.

The two intestinal coeca extend to the dorsal brain lobe.

The cerebral sense organs are voluminous, and extend to the brain; the ciliated cleft does not extend to the dorsal side of the head.

A large cephalic gland surrounds the rhynchodaeum, extending posteriorly to the brain. It empties by a considerable number of ducts on the anterior end of the head.

Sexes separate; the ovaries situated above the nerve chords, 1 to 10 ova present in each ovary; the testicles are placed both above and below the nerve chords.

The ocelli (Figs. 14, 15), as noted above, extend along the nerve chords behind the brain, in the oesophageal region; in very large individuals there may be as many as 12 or 15 in a single row on each side of the body, behind the brain. These posterior ocelli are absent in very young individuals, and are always smaller than those of the head. There is a considerable number of eyes on the dorsal side of the head, varying, however, not only with age, but also in different individuals of the same size. They are as a rule situated on the margins of the head, as in Fig. 14, about 1 to 3 rows deep on each side; sometimes there is a tendency to the formation of transverse rows of ocelli, as in Fig. 15.

The color varies from a milky-white or yellowish (as at Wood's Holl) to a pure green (Sea Isle). This species attains a length of 40 or 50 mm. In full extension the head is rounded, considerably wider than the neck; the body becoming very elongated. The body is not flattened, but cylindrical in shape.

I have found this species at Wood's Holl and at Sea Isle, on sea-weeds and wooden piers, at about low tide level. At Sea Isle it is more abundant, and reaches a greater length, than at Wood's Holl.

This new genus *Zygonemertes* unites characters of *Eunemertes* and *Amphiporus*, whence the application of the name I have given it, which signifies literally "Yoke-Nemertean". It approaches *Eunemertes* 1) in the abbreviation of the proboscis, and in the shape of the basis of the central stilet; in no other Nemertean does the stilet basis have



this elongated form, with posterior truncation, except in *Prosorhochmus claparedii* (cf. the figure in M'INTOSH'S "Monograph"); 2) in the large number of the ocelli; 3) in the presence of subepithelial gland cells in the head. In regard to the other points in its structure, it resembles *Amphiporus*. In one point it differs sharply from all other Metanemertean genera: the shortness of the proboscis, in connection with the length of the rhynchocoel. VERRILL, who first described this species, assigned it to *Amphiporus*; the notes on its anatomy, which I have given, demonstrate that it should be placed in a new genus.

Not only is *Zygonemertes* intermediate between *Eunemertes* and *Amphiporus*, but also between BÜRGER'S ("Monographie", 1895) groups of the *Holo-* and *Prorhynchocoelia*, since it unites a very short proboscis, with a long rhynchocoel<sup>1</sup>).

## 2. *Proneurotes multioculatus* n. g. n. sp.

The lateral nerve chords unite posteriorly below the intestine, about 1 mm anterior to the posterior end of the body; both rhynchocoel and blood vessels are continued for some distance behind this nerve commissure (Fig. 27). In no other Metanemertean do the rhynchocoel and blood vessels extend posteriorly as far as this commissure; and in probably all others of this group, the commissure lies above the intestine. Anteriorly, the lateral chords lie at the latero-ventral sides of the body.

The rhynchocoel is voluminous, and extends to the posterior end of the body. Characteristic for this new genus are the unpaired diverticula, 5 in number, which are evaginations of the ventral side of the rhynchocoel, and terminate as culs-de-sac. Two of them (the 2<sup>nd</sup> and 3<sup>rd</sup>) course posteriorly, the remaining three, anteriorly; and 3 of the 5 lie in the posterior quarter of the body. The 4 anterior evaginations have a length of from  $\frac{1}{250}$  to  $\frac{1}{300}$  of an inch, the 5<sup>th</sup> (most posterior) is more than four times as long as any of the others, with a length of about  $\frac{1}{60}$  of an inch. The cavity of the 5<sup>th</sup> attains a diameter of about one fourth that of the rhynchocoel, while the remaining four have only about  $\frac{1}{2}$  to  $\frac{1}{3}$  the diameter of the 5<sup>th</sup>. The latter differs from the preceding four, also, in that, while it arises from the ventral side of the rhynchocoel, as the others do, it

1) The structure of the Nephridia is explained in the postscript on page 12.



does not remain below the rhynchocoel, but passes to the right of it (Fig. 27 *R.D.*). All these evaginations are very thin-walled, in comparison with the rhynchocoel, their musculature consisting (without) of a single layer of circular, and (within) of a single layer of longitudinal muscle fibres. There is no outer mantle of parenchym cells encircling them, as is present around the rhynchocoel. The only other Nemertean with rhynchocoelic diverticula is *Drepanophorus*, as described by HUBRECHT and BÜRGER; but in that genus the diverticula are paired, do not arise from the ventral side of the rhynchocoel, and are more numerous.

The proboscis and its armature is as in *Amphiporus*: the stilet basis (Fig. 20) is rounded posteriorly, without medial constriction there are two lateral stilet pockets. Longitudinal nerves of the proboscis, 11 in number.

No sensory hairs in the body epithelium.

The longitudinal musculature of the body wall is ventrally about twice as thick as the body epithelium; dorsally it is about one half as thick as ventrally.

The dorsal blood vessel is very small in diameter (Fig. 27), as are the lateral vessels; in no other Metanemertean which I have examined, are they of such small diameter.

Short nephridia, of the *Amphiporus* type, present in the cerebral region.

Body cavity large, containing mesenchym cells.

The cephalic gland extends posteriorly to the brain.

Dioecish. The only individual which I found of this species was a female, with numerous ovaries, the latter extending on each side from the ventral median line dorsally to the side of the rhynchocoel, so that on a given frontal section there were as many as 8 ova on each side (a single ovum matures in each ovary).

The length of the single individual which I found was about 20 mm. The head scarcely wider than the body, rounded terminally. Width of the body about 2 to 3 mm when fully extended, largest posteriorly, not flattened. Contracts to about  $\frac{1}{4}$  its extended length, as an *Amphiporus*. Color, deep yellowish-brown, becoming orange anteriorly.

Ocelli (Fig. 12) medium sized, arranged in two groups on each side of the head, 17 ocelli on the right, 19 on the left. The anterior group of each side forms a single curved line, the anterior ocelli of which follow the lateral margin of the head, while the posterior 4



or 5 ocelli form a straight line, deflected medially; the anterior group of ocelli is placed anterior to the cephalic cleft. The posterior group of each side, situated behind this cleft, consists of two nearly parallel rows of ocelli, the posterior ends of which are directed inward; the anterior row on each side consists of 5 ocelli, placed in a straight line, and these ocelli are larger than those of the posterior row.

This new species being unique in having the lateral chord commissure situated ventrally anterior to the posterior termination of the rhynchocoel and blood vessels, and in having 5 unpaired, ventral diverticula of the rhynchocoel, has occasioned me to consider it as representative of a new genus, *Proneurotes* (the name having reference to the anterior position of the nerve commissure). *Proneurotes* is otherwise, except in the very small size of its blood vessels, related to *Amphiporus*.

The single specimen of this species I found among Hydroids on a wooden railroad pier, about low tide level, at Sea Isle.

### 3. *Amphiporus greenmani* n. sp.

The arrangement of the ocelli (Figs. 1—11) is characteristic for this species, though, as the figures show, there is considerable variation in their number and distribution, irrespective of age. The ocelli are rather large, usually 8—10 in number on each side of the head, rarely 12 on one side (Fig. 3); posteriorly they do not extend to the brain. In mature individuals two rows of eyes may usually be distinguished on each side of the head. Each anterior row is marginally situated, extending from the tip of the snout, to a little behind the cephalic cleft; the row is curved, sometimes more or less in zigzag, and posteriorly curves inward. In general, the ocelli of each anterior row may be said to be placed in a single curved line, which is posteriorly directed inwards; but quite frequently ocelli may be present outside of this line, and at the posterior end of the latter there is a tendency to the production of a little bunch of ocelli, or of a transverse row of two or three ocelli (Figs. 1, 3, 6, 7, 10). The posterior group of ocelli on each side lies behind the cephalic cleft, and is usually separated by a short distance from the anterior group; it generally consists of an oblique row of from 2 to 4 ocelli, directed backwards and inwards (Figs. 1, 2, 5, 6, 7, 9). Seldom are the anterior and posterior rows confluent (Fig. 2). In young individuals the ocelli are fewer in number, and arranged in an irregular line along each side of the head (Figs. 8, 10, 11). Sometimes the arrange-



ment of the ocelli resembles that of *Proneurotes multioculatus* (cf. Fig. 6 with Fig. 12); but the ocelli of *A. greenmani* are larger and little over half as numerous as those of *Proneurotes*.

The lateral nerve chords commissure at the end of the body, above the intestine.

The oesophagus opens into the rhynchodaeum.

The 2 intestinal coeca reach to the dorsal portion of the dorsal brain lobe.

Sensory hairs are present in the body epithelium, in the anal region; pigment is absent.

Cephalic sense organs reach the brain. The cephalic gland is not very voluminous, not extending behind the brain.

The rhynchocoel extends to the posterior end of the body. 11 longitudinal nerves in the proboscis. Stilet about as long as its basis; the latter (Fig. 17) rounded basally, constricted in its middle portion. Two lateral stilet pockets present.

Sexes separate. One or two ova in each ovary; the ovaries numerous, placed both above and below the nerve chords, 2 to 4 in number on each side of the body, in a given frontal plane.

Length about 30 mm. Head scarcely wider than neck, truncated anteriorly. Width, when extended, about 1 mm. Very contractile, lively in its motions, seeking (in captivity at least) the surface of the water. Color creamy-white or pinkish, quite transparent. Does not secrete large quantities of viscid mucus, as does *A. glutinosus*.

*A. greenmani* differs from *A. ochraceus* VERR. in its smaller size, different color, and fewer ocelli. Thus, to quote VERRILL's description of the latter species: "Ocelli numerous, but varying somewhat in number; the anterior ones form a submarginal curved row along each side of the head, anteriorly, but curve inward farther back; just back of these, on each side, there are usually four distinct posterior ocelli; standing two by two, obliquely. Color dull yellowish, or yellowish-white, often tinged with deeper yellow or orange anteriorly, with the median line lighter. . . . Length 50 mm to 70 mm; breadth 2,5 mm to 3 mm."

It also differs from the related *Amphiporus (Polina) griseus* (STIMPS.), as is seen from STIMPSON's (in: Proc. Acad. Nat. Sc. Philadelphia, V. 9, 1857, p. 164) description of this species: "*Ocelli in acervos quatuor aggregati. . . . Ocellorum acervi anteriores majores, elongati, in parte antero-laterali capitis submarginales dispositi; ocelli*



*decem in utroque acervo. Acervi posteriores cervicales, parvi, lineares; utroque quatuor ocelli. . . . Corpus . . . colore pallide griseum*".

To this species I have applied the name *greenmani*, in honor of my friend MILTON J. GREENMAN, M. D., Assistant Director of the Wistar Institute of Anatomy and Biology, whose hospitality I enjoyed during my collecting trip at Sea Isle.

*Amphiporus greenmani* was abundant in Ludlam Bay, Sea Isle, living with *Zygonemertes* and *Tetrastemma* in the sea-weeds with which this inlet of the ocean abounds.

#### 4. *Amphiporus glutinosus* (VERR.).

The brief description given by VERRILL of this species, may be supplemented by the following anatomical notes:

The lateral nerve chords commissure at the posterior end of the body, above the intestine.

The oesophagus empties into the rhynchodaeum.

No sensory hairs are present in the body epithelium. Large, rounded gland cells, which stain with haematoxylin, are very abundant in the epithelium, producing the viscid slime which this species produces in such abundance, and which is very characteristic of it.

Rhynchocoel extends posteriorly as far as the commissure of the blood vessels. There are 11 longitudinal nerves in the proboscis. The central stilet is larger than its basis; the latter is rounded and most swollen posteriorly, constricted medially; Fig. 18 shows the usual form, while in Fig 19 is to be seen an abnormal stilet basis. There are always two lateral stilet pockets.

The paired intestinal coeca extend to the dorsal brain commissure.

Nephridia not more than one-third the length of the oesophageal region.

The cerebral sense organs reach the brain.

The cerebral gland is voluminous, but does not extend behind the brain.

One or two ova are found in each ovary. The ovaries are numerous, as many as 4 or 6 being found on each side, on a given frontal section; while in the males] as many as 12 testicles may occur on each side. Both ovaries and testicles are placed above and below the nerve chords.

Color white, or pale yellowish, not translucent. Head scarcely



wider than neck, rounded anteriorly (Fig. 13). I have seen individuals of about 20 mm in length, but this species probably grows to a still greater size, since I obtained no fully mature specimens; width 1.5 to 2 mm: this species must accordingly be classed in the category of the relatively short and stocky *Amphiporus*-species. It is of greater diameter posteriorly. Very contractile. In its appearance, it reminds one of a leech, rather than a Nemertean.

Ocelli, about 10 or 12 on each side of the head, of large size (Fig. 13), though the ocelli may vary in dimensions in the same individual. They are arranged in an irregular row along the margin of the head, on each side, but do not reach the brain. The three posterior ocelli, behind the cephalic cleft, often form an oblique row on each side, directed backwards and inwards; but these oblique lines are not as marked as in *A. greenmani*.

I found this species abundant at Wood's Holl, in the so-called "Eel Pond", a small inlet of the sea, which has a depth of water of only 2 or 3 feet at low tide, and in which sea-weeds and eel-grass is abundant.

##### 5. *Tetrastemma elegans* VERR.

The oesophagus opens into the rhynchodaeum. The intestinal coeca reach to the dorsal surface of the dorsal brain lobe.

The lateral nerve chords commissure posteriorly above the intestine.

Sensory hairs are absent in the snout, but present on the posterior end of the body. There is a yellowish-brown pigment in the interstitial tissue, but none in the supporting cells of the body epithelium.

The rhynchocoel does not extend quite to the posterior end of the body, but terminates about  $\frac{1}{160}$  in anterior to it. There are 10 proboscideal nerves. The central stilet is about equal in length to its basis, the latter is rounded posteriorly, without a medial constriction.

Sexes separate. The gonads are situated both above and below the nerve chords; there are from 1 to 4 ova in each ovary.

Length to about 15 mm. Distance between the anterior and posterior eyes about equal to that separating two eyes of one side; the anterior eyes nearer, together, than the posterior. Head rounded, noticeably wider than the neck.

The characteristic coloration of this species is due to the presence of two reddish-brown pigment bands, parallel in position, each



of which connects the two eyes of a side, and passes posteriorly to the end of the body. Each of these bands is frequently of such width and intensity of coloration, as to be easily seen with the naked eye. But quite often, more especially in young individuals, the pigment bands are more or less indistinct and not continuous, with the pigment of a less intense color and amount; which bring us to individuals in which almost no evidences of these markings are to be found. The position of the eyes and shape of the head, which VERRILL has described, are, however, always good criteria for determining the species.

I found this species to be quite numerous among sea-weeds in Ludlam Bay, Sea Isle, though not as abundant as *T. flagellatum*.

#### 6. *Tetrastemma vermiculum* (QUATR.).

The commissure of the lateral nerve chords lies above the intestine, at the posterior end of the body.

The oesophagus opens into the rhynchodaeum. The intestinal coeca extend to the dorsal brain lobes.

Sensory hairs are absent in the body epithelium; the pigment of the head region is contained in the supporting cells (cf. *T. elegans* and *T. catenulatum*).

The cephalic gland is not very voluminous, and extends only to the brain.

The rhynchocoel extends to the posterior end of the body. The central stilet of the proboscis is rounded basally, and slightly constricted medially, though the medial constriction is not infrequently absent (as in Fig. 25, which represents an abnormally large stilet basis, Figs. 17—22, 24, 25 being drawn under the same scale of magnification). The stilet basis apparently increases with the age of the individual; but since in very large individuals, the size of the stilet basis is not infrequently very small relatively, it would seem to be not unusual for it to be cast off, and for a new one to be produced. A very abnormal accessory stilet from one of the lateral pockets is reproduced in Fig. 26. There are two of these lateral pockets, each of them usually containing three stilets. I have noticed the following variations in the number of the stilets in both pockets:

2—1,	3—3 (average number),	5— 5,
2—2,	4—4,	5— 6,
2—3,	4—5,	4— 8,
2—4,	4—6,	5—11.



*T. vermiculum* reaches about 15 mm in length. The distance between the anterior and posterior ocelli is but little greater than that between the two eyes of a pair. A stripe of reddish-brown pigment, which is sometimes absent, encloses on each side of the head the anterior eye, but seldom extends to the posterior one; there are no pigment markings behind the head, but the whole body is of a yellowish or orange color.

The sexes are separate; the number of ova in each ovary varies from one to three.

This species I found very abundant at Newport, on sea-weeds and Bryozoa, between tides.

### 7. *Tetrastemma catenulatum* (VERR.).

= *T. vermiculum catenulatum* VERR.

In a previous contribution ("On the Connective Tissue and Body Cavities of the Nemerteans, with Notes on Classification", in: Zool. Jahrb., V. 10, Anat., 1896) I have shown that this form must be separated from *T. vermiculum*, for the following reasons: 1) the interstitial tissue, and not the supporting cells of the body epithelium is the seat of the pigment; and 2) there is not only a pigment mass between the eyes, but irregular pigment mottlings are present on each side of the dorsal surface of the body (Fig. 16). Otherwise *T. catenulatum* closely resembles *T. vermiculum*.

Abundant at Wood's Holl, on sea-weeds below low tide, on piers and stones.

### 8. *Tetrastemma flagellatum* n. sp.

This new species differs from the preceding two forms, in the following points:

The eyes occupy the corners of an elongated rectangle; the distance between the two eyes of the anterior pair, equals that between those of the posterior pair; but the distance between the two eyes of a pair, is scarcely more than half the distance between the anterior and posterior eyes.

The head is not wider than the neck, truncated anteriorly.

Sense hairs occur at both ends of the body.

The central stilet of the proboscis is noticeably larger than its basis.

Streaked masses of reddish-brown pigment occur between the two eyes of each pair, this pigment sometimes nearly filling the whole



space on the dorsal surface of the head. Pigment is also found along the whole upper surface of the body, though it does not produce large blotches or patches as in *T. catenulatum*, but is always finely sprinkled or scattered along the body.

Length never exceeding 10 mm. Proportionately more slender than the preceding species of this genus.

Abundant in Ludlam Bay, Sea Isle, on sea-weeds.

The specific name "*flagellatum*", which I have given to this form, refers to the flagella, or vibratile hairs, which are found in its epithelium.

In conclusion, I would draw attention to the fact, that none of the Metanemertean which I found at Wood's Holl and Newport possessed sensory (tactile?) hairs in the body epithelium; while three of the five species collecting at Sea Isle possessed them — these being *Amphiporus greenmani*, *Tetr. elegans* and *T. flagellatum*. Is this to be explained on the ground of there being some subtle difference of environment at Sea Isle, which should occasion their presence?

#### Postscript on the anatomy of *Zygonemertes virescens*.

There is one pair of nephridia present, of the type characteristic for *Amphiporus*. Each nephridium extends from the head region, on the other side of the corresponding ventral lobe of the brain, to the posterior portion of the oesophageal region. The excretory pores, one to each nephridium, lie at the anterior ends of the latter, and open on the latero-ventral sides of the body. The main duct does not form loops, but takes a nearly straight course from before backwards; it is situated on the dorsal side of the lateral nerve chord, at the side of the intestinal coecum, though at occasional points it passes to the ventral side of the chord. From it, at occasional intervals, side branches (ductules) are given off; these are of short length, and either pass upwards along the sides of the intestinal coeca, or embrace the nerve chord ventrally. I have been unable to determine the structure of the terminal bulbs ("Endkölbchen").



## Explanation of Plate.

### Plate 1.

Figs. 1—11. *Amphiporus greenmani*. Arrangement of ocelli on the head, the outlines of the brain given. Figs. 8, 10, 11, from young individuals. From life,  $\times$  about 15.

Fig. 12. *Proneurotes multioculatus*. Position of ocelli on the head. From life,  $\times$  about 15.

Fig. 13. *Amphiporus glutinosus*. Arrangement of ocelli on the head. From life,  $\times$  about 15.

Figs. 14, 15. *Zygonemertes virescens*. Arrangement of ocelli in the head and oesophageal regions. From life,  $\times$  about 15.

Fig. 16. *Tetrastemma catenulatum*. (Wood's Holl.) Dorsal surface of the head and anterior portion of the body. The natural color of the eyes, pigmented mottlings, and brain reproduced. From life,  $\times$  about 22.

Fig. 17. *Amphiporus greenmani*. Section of the central stilet and basis. ZEISS, camera lucida, oc. 4, obj. C.

Fig. 18. *Amphiporus glutinosus*. Section of central stilet and its basis. Camera lucida ZEISS, oc. 4, obj. C.

Fig. 19. The same. Section of an abnormal stilet basis.

Fig. 20. *Proneurotes multioculatus*. Section of stilet basis. Camera lucida, ZEISS, oc. 4, obj. C.

Figs. 21, 22. *Tetrastemma catenulatum*. Stilet and stilet basis. Camera lucida, ZEISS, oc. 4, obj. C.

Fig. 23. *Zygonemertes virescens*. A curved body out of the body epithelium. Camera lucida, ZEISS, oc. 4, homog. immers.  $\frac{1}{12}$ , tube extended.

Fig. 24. The same. Central stilet and basis, from an immature individual of 4 mm length. Camera lucida, ZEISS, oc. 4, obj. C.

Fig. 25. *Tetrastemma vermiculum*. An unusually large stilet basis. Camera lucida, oc. 4, obj. C.

Fig. 26. The same. An abnormal stilet from a lateral pocket. Free hand drawing, considerably magnified.

Fig. 27. *Proneurotes multioculatus*. Transverse section through the body, near the posterior end, the section cutting the commissure of



the nerve chords (*N.Comm*), and the most posterior rhynchocoelic diverticulum (*R.D*). *R* rhynchocoel; *R.S* sheath of the latter; *Int* intestine, *Int.D* metameric diverticulum of the intestine ("Darmtasche"); *Ep.M* epithelial muscular wall; *Ov* ovum. Beneath the rhynchocoelic sheath (*R.S*) is seen the dorsal blood vessel, the lateral vessels being placed at the latero-ventral corners of the body. Camera lucida, ZEISS, oc. 2, obj. A.

Fig. 28. *Zygonemertes virescens*. Outline of the body, within which, in the rhynchocoel (*R*), lies the proboscis: *A.P* papillary portion, *St.R* stilet region, *P.P* posterior region, *R.M* retractor muscle of the proboscis. *R.S* sheath of the rhynchocoel. *A* anterior end (head), *P* posterior end of the body.  $\times$  about 10, from a section.





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