Marine free-living Nematodes from Danish waters

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Videnskabelige Meddelelser fra Dansk naturhistorisk Forening i Kjøbenhavn 70:147-214 (1919)
http://biostor.org/reference/97760

Marine freeliving Nematodes from Danish waters.

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The present paper is a contribution to the knowledge of the freeliving Nematodes of Danish waters.

The material was partly dredged, partly collected littorally on piers and bridge-pillars among Algæ and Hydroids or on overgrown stones in the edge of the water. In the bottom Nematodes seem to be found everywhere, even in clean sand, where some of the largest and most interesting forms were taken. The amount of material obtained by the dredge was considerable.

The great majority of the specimens were collected by the author during the last years on stays at the coast in the summer season. For some forms I am indepted to Mag. P. Kramp who has kindly forwarded to me the material washed off from Hydroids, collected by him at different localities.

My work has been subventioned by the Japetus Steenstrup fund and by the Carlsberg fund. I beg to offer my best thanks to both these institutions and to the Carlsberg fund for having paid the reproduction of the plates.

On the whole marine freeliving Nematodes have been hitherto but little investigated. Considering the multitude of interesting forms belonging to this group it appears strange that so few investigators have paid any attention to these animals. On this occasion I shall not enter into details as to the historical point of view. For all nematologists Bastian's Monograph and de Man's papers are fundamental

and the papers of Bütschli, Marion and Villot are well-known. In the very last time have appeared the results of several investigations of more special nature; I shall mention here the paper of Jägerskiöld from 1901 partly dealing with some interesting marine forms, that of Türk from 1903 dealing with different species of the genus *Thoracostoma* and finally those of Stewart and Rauther from respectively 1906 and 1907, both of them dealing with marine forms. All these investigations have brought about a great increase of our knowledge concerning the group under consideration. Finally a few faunistic papers have appeared of late, namely the work of Southern 1914, dealing with Irish Nemathelmia, Kinorhyncha and Chaetognatha and in 1916 a paper of Steiner, dealing with Nematodes from the Barentsea, published in Zool. Jahrbücher, Bd. 29. The same year Filipjev published a paper entitled: „Les nématodes libres contenus dans les collection du Musée Zoologique de l'Académie Impériale des sciences de Petrograd".

Danish marine freeliving Nematodes have not hitherto been subject to investigations. In his paper (1904) on *Hypodontolaimus inæqualis* Jägerskiöld mentions besides this species some others which were collected by Wesenberg-Lund at the West coast of Jutland, namely *Tripyloides vulgaris* and *Oncholaimus fuscus*, and these are the first Danish species which have been identified. In my paper from 1911, „Danish freeliving Nematodes" moreover a few marine forms were recorded, namely: *Monohystera socialis* Bütschli, *Oncholaimus viridis* Bastian, *Oncholaimus oxyuris* Ditlevsen, *Enoplus communis* Bastian and *Rhabditis marina* Bastian. All the species described in this paper, except those named above, are new to the Danish Fauna.

LIST OF SPECIES.

Monohystera Bastian.

Besides the two species named below several other specimens belonging to this genus are found in my material. But partly the preservation is not satisfactory partly the species of this genus are difficult to identify, especially when only females are available. I prefer, therefore, to put off the working out of these species till more material can be procured. Perhaps it appears strange that so few species of this genus are found in my material as a number are known from other European coasts; I shall remark hereto that — so far as my experience goes — this genus is represented especially in the littoral fauna, while my material has been dredged mainly in deeper water. Most of my specimens belonging to this genus were taken among algæ on stones in the edge of the water, on bridge-pilllars or alike.

Monohystera tenuispiculum n. sp.

Pl. I. figs. 3. 6. 10.

Little Belt; off Lyng's Odde.

A single male specimen has been taken. The length makes 1,3 mm. The body is rather slender tapering slightly towards each extremity like Monohystera dispar. Also the tail is like the tail of this species (Pl. I, fig. 3). The width of the body is 48 μ at the level of the base of the œsophagus, 24 μ at the level of the buccal cavity.

The cuticula shows fine transverse striæ.

The setæ, arranged on the head in one ring, are slender and of medium length (Pl. I, fig. 10). The buccal cavity is of the shape commonly found in the genus *Monohystera*; in optical section it appears as a triangle of nearly equal sides; one of the angles continues into the chitin-intima of the œsophagus. Eyespots are not seen; nor has it been possible to find any lateral organ.

The œsophagus is nearly of equal width during the foremost two thirds of its length; from here it increases gradually towards its base without forming a bulb. The nerve-ring is indistinct.

Striking at the first glance is the peculiar shape of the spicules. These are exceedingly thin and provided with a dilatation in both ends. In the distal end the tip is bifid. Probably a little accessory piece is present; at any rate I interpret thus the little bow-shaped prominence seen hehind the tip of the spicule (Pl. I, fig. 6).

I think it is beyond doubt that this species is a Monohystera. I do not lay much stress on the fact, that lateral organs can not be seen in the single specimen at my disposal. Often I have observed in a collection of a species how this organ can be plainly visible in some specimens while at the same time it can be impossible to find any trace of it in others.

Length 1,3 mm.

$\alpha = 28$; $\beta = 4{,}0$; $\gamma = 8{,}5$.

Monohystera setosa Bütschli.

1874. Monohystera setosa Bütschli, Zur Kenntniss d. freil. Nemat. p. 29.

1888. Monohystera setosa de Man, Sur quelques nématodes libres &c. p. 9.

Little Belt; near Kongebro. Low water.

A single female was taken. It agrees well with the descriptions and is typical in all respects.

Enchelidium Ehrenberg.

Enchelidium tenuicolle Eberth.

Pl. I, figs. 1, 4, 11. Pl. II, fig. 9.

1863. Enchelidium tenuicolle Eberth, Untersuch. über Nemat. p. 23.

1914. — — Southern, Clare Island Survey. p. 14.

Limfjord; off Fur, 0—1 fm.

— Salling-sound, 3—4 fms.

— Ørodde; in Sphacellaria on Fucus.

From the above named localities 8 specimens are at hand, all males. Until lately only males were known of this genus, but in 1916 Steiner established a new species on a female specimen. However I must remark that Southern who has found the species here dealt with on two localities (Blacksod Bay and Balynakill Harbour) does not mention at all the sex of his specimens, so he may possibly have had both sexes.

The specimens from the Limfjord agree well with the description of Eberth as well as with his figures excepting some details which the named author has not interpreted correctly. To form a conception of the habit of the animal his figgs. 1 and 2, Taf. III,

are rather satisfactory. Characteristic of the species is the successive and strong tapering of the body in the front end, which shows a head-like dilatation. This „head" is thickest in the front and carries a circlet of papillæ, 3 subdorsal and 3 subventral on each side. Besides these papillæ are found — as far as it is possible to ascertain — a circlet, consisting of 10 bristles in all. Behind the bristles is a neck-like constriction, on which the lateral organs are situated. The shape of these is like a biconvex lens seen from the edge in optical section and placed vertically to the longitudinal axis of the body; they seem to differ somewhat in shape from the lateral organs described by de Man in *Enchelidium marinum* Ehrbg. as „des ouvertures transversales élliptiques". Immediately behind the named constriction is found an extension in which two eyes are situated. Each of these consists of a globular highly refringing lens placed in a calyx-shaped heap of read pigment (Pl. I, fig. 4).

Behind this extension the body has another constriction and only caudally for this it increases constantly. After having reached its full thickness the body keeps thus until the anal region. The shape of the tail is conical and tapers gradually towards the tip where — as usual in marine Nematodes — a little extension is found before the very tip, which bears a little conical prominence, where the excretory tubes of the caudal glands open.

As de Man remarks in his diagnosis of the genus *Enchelidium* no pharynx is found and the introductory canal to the œsophagus from the mouth-opening is as narrow and delicate as a prick of a needle.

The œsophagus, measured on specimens from the Limfjord constitutes about one sixth of the whole length of the body, (Eberth indicates one fifth) and is very thin in its anterior half. Only towards its posterior end it begins to increase successively and at its base it is of the same thickness as the intestine. The œsophagus terminates with a short conical prominence, projecting into the lumen of the intestine, a case well-known in freeliving Nematodes (Pl. II, fig. 9).

The intestine is surrounded by a highly developed layer of brown pigment rendering a very characteristic aspect to the animal. The pigment-granules are not crowded together with the same density everywhere; here and there they form compact heaps united by means of bridges consisting of brown pigment-granules lying

less densely (Pl. I, fig. 11). With low power under the microscope the pigment is seen as an irregularly winded band of brown colour, stretching along the body.

As far as can be seen in my specimens the œsophagus appears to be of a peculiar structure. Possibly this appearance is owing to the surrounding cells which are hiding the real fact, but in any case nothing is seen of the usual transverse striation characterizing in most of the freeliving Nematodes the structure of the œsophagus. A figure resembling that given by Steiner of *Enchelidium polare* (l. c. Taf. 16, f. 28 c.), the œsophagus of which is like that found in the genus *Phanoderma* is not seen in my specimens.

A ventral gland is present, situated at some distance behind the base of the œsophagus, alongside the intestine. This gland consists of a single cell which also forms the excretory duct running forwards and opening on the ventral side of the „neck" of the animal somewhat caudad for the eyes. In a specimen, the length of which mesured 4,3 mm, the gland was situated 297 μ behind the front end. The excretory duct opens by means of a very thin excretory tube issuing from an ampulla in the foremost part of the body (Pl. I, fig. 1). The canal itself as well as the hindmost part of the ampulla is — as far as it has been possible to ascertain in my preparation — of a protoplasmatic structure and a part of the secernating cell itself; the excretory tube and the foremost half of the ampulla is, on the contrary, a formation originating from the cuticula. Pl. I, fig. 1 shows this case; the canal is of quite the same protoplasmatic structure as the cell and this structure can be followed unto the ampulla, where the duct extends and forms two lips enclosing the hindmost part of the ampulla. This case is, for the rest, not unique among freeliving Nematodes; I have observed the like in other genera.

As to the genital apparatus I have nothing to add to Eberth's description; I shall only remark, that the 32 anal „Höcker" mentioned by this author are presumably not to be considered as veritable masculine papillæ but only as projections owing their occurrence to the stiff cuticula in the strongly bent hind-part of the body; a settling of this question is scarcely possible on preserved material but I suppose it will be easy on living specimens.

Enchelidium tenuicolle is surely a very vagabondary species; that it can be met with in the top of Fucus among the Sphacellaria here situated, proves this. The large lens-carrying eyes also point in this direction. Perhaps the females behave otherwise as they are not generally found together with the males.

Aræolaimus de Man.

Aræolaimus elegans de Man.

Pl. V, fig. 4.

1888. Aræolaimus elegans de Man, Sur quelques Némat. &c. p. 16.
1916. — — Steiner, Freil. Nemat. a. d. Barentsee. p. 634.

Little Belt; pier of Middelfart.

A single male was taken. It agrees well with the description of de Man; there is no doubt about the identity of the species, the form of the spicules and the accessory piece plainly prove this.

As to the ventral gland Steiner suggests that the excretory pore is situated more cephalad than indicated by de Man. In order to try to settle this question I stained the specimen at my disposal with Carm-Alum. The ventral gland itself is relatively large and is situated, as indicates Steiner, behind the limit between the œsophagus and the intestine at a distance from this point equal to half the length of the œsophagus. In my specimen it is placed mainly ventrally and for want of space it pushes aside the intestine and compresses it somewhat. In front of the ventral gland a series of cells or protoplasmatic bodies are seen (Pl. V, fig. 4); I must consider these as a part of the excretory canal artificially altered during the preservation and not as veritable cells. As this canal in all forms provided with a ventral gland is part of the glandular cell itself, it cannot be supposed that this species should be provided with a unicellular ventral gland with a pluricellular canal. More cephalad is seen the foremost part of the canal which is quite normal with its ampulla as shown in my figure. And as far as I have been able to ascertain the efferent tube issuing from the ampulla is quite short and not so long as figured by Steiner. In the danish specimen this pore is placed at the level of the eye as is the case in the species described by de Man from the North Sea.

Dipeltis Cobb.

It is beyond doubt that Eberth was the first to find this genus. He describes his species as *Enoplus cirrhatus*. For this form and for two other species Cobb in 1891 established the genus *Dipeltis*. Perhaps also de Man's *Arœolaimus* (*Arœolaimoides*) *microphthalmus* will prove to belong to this genus as suggested by Southern in his paper from 1914.

Dipeltis incisus Southern.

1914. Dipeltis incisus Southern, Clare Island Survey, p. 17.

Little Belt; off Snoghøj, c. 5—30 m.

I have found two specimens of this exceedingly characteristic Nematode, both females, in the Little Belt, off Snoghøj. They agree well with the description of Southern. My specimens only are somewhat smaller than the Irish which reach a length of 2,02 mm. The largest Danish specimen, an egg-producing female, measures only 1,62 mm, while the other, also a mature female is somewhat smaller and only reaches a length of 1,4 mm.

To the description of Southern I have nothing to add; I shall only remark that the „transparent cap" mentioned by Southern who suggested it „owing to the contraction of the muscles away from the cuticle" also is seen in both of my specimens.

Terschellingia de Man.

Terschellingia longicaudata de Man.

1907. Terschellingia longicaudata de Man, Sur quelques espèces &c. p. 39.

The Sound; off Hellebæk S.O. 10—12 fms.

Only one specimen, a male, has been found. It measured 1,9 mm and agrees well with de Man's description.

Spira Bastian.

Spira parasitifera Bastian.

Pl. I. figs. 7, 8; Pl. II, fig. 5.

1865. Spira parasitifera Bastian, Monograph. p. 159.

1859. — de Man, Nématodes de la mer du Nord &c. p. 175.

1914. Spira parasitifera, Southern, Clare Island Survey. p. 26.
1916. — Steiner, Freil. Nemat. a. d. Barentsee. p. 592.

Limfjord; off Holmegaarde, 0—1 fm.

Kattegat; off Frederikshavn, c. 5 fms. On Halidrys.

The Sound; Hellebæk, 10—12 fms.

Little Belt; Kongebro. Among Hydroids.

If we regard the figures of this species in Bastian's Monograph and compare them with those in the paper of de Man the great difference in the shape of the tail is very striking. As the figure of Bastian does not appear to agree with any known free-living Nematode it is to be supposed that this figure is a failure. The figure of de Man, very different to this, agrees well with what is seen in my preparations; also the description of de Man agrees well with the Danish specimens, which only appear to be somewhat smaller than those from the North Sea and the Channel. de Man indicates for both sexes the length of 3,5 mm. The largest of the Danish specimens only measures 3,0 mm. Further, all my preparations are unsuitable for correct measuring — a fact due to the exceedingly thin and delicate cuticle characteristic of this species. As a consequence of this fact the species does not endure the method of preservation generally suitable to attain irreprochable preparations of other marine forms. I have not hitherto been able to take this into consideration as it was important to me to collect and preserve so many forms as possible.

Camacolaimus de Man.

Camacolaimus tardus de Man.

Pl. II. fig. 2; Pl. III. fig. 9.

1889. Camacolaimus tardus de Man, Espèce et genres nouveaux &c. p. 8.
1889. Camacolaimus tardus de Man, Troisième note &c. p. 184.
1916. — — Steiner, Freil. Nemat. a. d. Barentsee. p. 607.

Little Belt; the pier of Middelfart

Only a single specimen of this interesting species has been found. Though it agrees rather well with the description of de Man some differences can be pointed out. I shall first mention that the

tail of the Danish specimen (Pl. III, fig. 9) appears to be only half the length of the tail of the specimens from the North Sea; see de Man's fig. 2d, Pl. V. Possibly this can be due to contraction caused by the preservation. My figure (Pl. II, fig. 2) shows how strongly the œsophagus is contracted; with respect to the tail the case is possibly the same. Finally the lateral organ proves to be relatively somewhat smaller than shows de Man's figure. Besides these differences the Danish specimen agrees well with those from the North Sea.

Linhomoeus Bastian.

Linhomoeus elongatus Bastian.

1865. Linhomoeus elongatus Bastian, Monograph p. 155.
1889. — — de Man, Troisième note &c. p. 207.
1916. — — Steiner, Freil. Nemat. a. d. Barentsee. p. 592.

Little Belt; off Snoghøj, c. 5 m.
— — c. 30 m.

Five specimens were taken, all typical.

Linhomoeus lineatus n. sp.

Pl. I, figs. 2, 5; Pl. II, fig. 3.

Little Belt; off Snoghøj, c. 5 m.

A single specimen has been taken, a female the length of which attains 4,1 mm.

In his paper from 1907: „Sur quelques espèces nouvelles ou peu connues de Nématodes libres habitant les côtes de la Zélande" de Man proposes the establishment of two subgenera, *Eulinhomoeus* and *Paralinhomoeus* under the genus *Linhomoeus*. *Eulinhomoeus* comprises those forms with a cylindric tail and with the buccal cavity armed with teeth; *Paralinhomoeus*, on the other side, those forms in which the tail „s'atténue plus ou moins distinctement" and with unarmed buccal cavity.

The species dealt with here lacks the dentition but has the tail nearly cylindrical. In this respect I have therefore been in a dilemma with the referring of it to one of the two subgenera; it seems to be a form intermediate between them, and it also shows affinity to the genus *Metalinhomoeus* de Man.

The animal is thread-shaped, about of the same thickness throuh-

out the whole length of the body. In the front part it only tapers slightly, the head itself is truncate. In the hind part of the body it keeps the average thickness untill the anal region; behind the anus it tapers very slowly and the shape of the tail is nearly cylindrical or something like a cone with almost the same width in the rounded tip and at the base (Pl. II, fig. 3). In the region of the genital glands the body grows somewhat thicker but it is a question whether this fact is not due to the preservation; at any rate this is a case often seen in preparations of Nematodes while it is presumably not found in living animals; I shall here give some measurements. At the level of the buccal cavity the width measures 40 μ, at the base of the œsophagus 48 μ, near the vulva 64 μ. A little before the anus it is again 48 μ, at the level of the anus 40 μ and finally at the middle of the tail 32 μ.

The cuticle, rather thin, shows transverse striæ. The head has a circlet of bristles, 6(?) in all, the four of which are situated sublaterally, the two dorsally and ventrally. The buccal cavity is like that described by de Man in *Metalinhomoeus typicus*; it is small. oval, with two chitinous thickenings. The likeness is easily seen when comparing my figure (Pl. I, fig. 2) with de Man's fig. 16 a, Pl. IV. As I have only one specimen of the Danish species at my disposal it is difficult to say how far the likeness in the structure of the buccal cavity really goes.

The lateral organs do not agree entirely with what obtains in *Metalinhomoeus*; they are more like those found in *Linhomoeus elongatus*; seen full face they show plainly a little circular spot in the middle of the organ.

The œsophagus is slender in its foremost half and increases towards the base without forming a veritable bulb. The peculiar apparatus „très petit appareil valvulaire", mentioned by de Man in *Metalinhomoeus*, lacks entirely. The nervering is found immediately in front of the middle of the œsophagus.

The intestine except its foremost part contains numerous refringing granules; they are arranged and crowded together in a peculiar manner. Seen in optical section under the microscope they form small leaf-shaped bodies originating from the midline of the intestine and diverging to both sides (Pl. I, fig. 5). With low power they are seen to form two dark streaks, running parallely through-out the whole length of the intestine.

A ventral gland is present. I have not been able to ascertain the place of the pore.

The female apparatus is symmetrical; vulva is situated somewhat before the middle of the body. The ovaries are very long; their ends are not reflexed. No mature eggs are seen in the uterus.

Length 4,1 mm.

$\alpha = 86(?)$; $\beta = 16,0$; $\gamma = 42,7$.

Anticoma Bastian.

Anticoma pellucida Bastian.

Pl. II, figs. 1. 7. 8.

1865. Anticoma pellucida Bastian, Monograph p. 142.
1874. — limalis Bütschli, Zur Kenntniss &c. p. 35.
1886. — pellucida de Man, Anat. Unters. p. 53.
1914. — — Southern, Clare Island Survey, p. 22.
1916. — — var. limalis, Steiner, Freil. Nemat. a. d. Barentsee. p. 654.

Kattegat; off Frederikshavn, c. 5 fms. On Halidrys.
Limfjord; off the northern coast of Isl. Fur, 2—6 fms.
— Ørodde, on bridge pillars.
— Skælholmen, 2—4 fms.
Little Belt: off Snoghøj, c. 30 m.
— Kongebro; on Hydroids.
— off Lyngs Odde.

Several specimens were taken. Among the females, very predominant in number, some are found with the tail considerably longer than shows the figure of de Man. The examining of the literature proves that these apparently aberrant specimens agree with Bütschli's *A. limalis*. In his paper dealing with the anatomy of Nematodes from the North-Sea de Man points out the named difference between the two forms without venturing to settle the question of the identity of *A. pellucida* and *A. limalis*. In 1916 Steiner is of opinion that Bütschli's *A. limalis* is a mere variety of *A. pellucida*. I must confess that I do not agree perfectly with Steiner in this respect. In my material is found a number of wellmarked long-tailed specimens (Pl. II, fig. 1), but also typical short-tailed specimens are found which seem to agree well with de Man's fig. 8, Taf. IX. Finally are found some in which the length

of the tail is rather intermediate. I have measured the length of the tail in 14 female specimens and if we express by means of a fraction the proportion between the length of the tail and the length of the body we have: 3 specimens with the fraction $^1/_7$, 3 with $^1/_8$, 5 with $^1/_9$, 1 with $^1/_{10}$ and 2 with $^1/_{11}$. My opinion is that the length of the tail varies considerably, especially in the females. Presumably *A. pellucida* is a rather widely distributed species and this fact perhaps renders it more variable on the whole. Also the place of the excretorial pore for the ventral gland changes; in some specimens it is situated more cephalad in others more caudad. But I cannot see that the place of the pore depends on the length of the tail so that f. i. the short-tailed form should have the pore situated more caudad or vice versa. I am inclined to mean that, the settling of the question of varieties in a species as *A. pellucida* would necessitate very thorough investigations on a great material.

In Pl. II, fig. 8 I have figured the foremost part of the excretory canal and its efferent tube. In de Man's fig. 2, Taf. IX is seen almost the same. The named author writes about this canal, l. c. p. 55: „In dem langen Ausführungsgange sieht man im Leben feine Körnchen hin und her fluktuiren; er mündet mittels eines kurzen chitinisirten Ausführungsrörchens nach aussen". In this respect the form shows great resemblance to *Enchelidium*; the ampulla is, like in this form, partly of protoplasmatic structure i. e. a veritable part of the excretory cell itself and partly a formation originating from the cuticle. It is possible in *Anticoma*, just as in the named species, to ascertain the limit between the protoplasmatic and the chitinous part of the ampulla. While in *Enchelidium* the protoplasmatic part forms two lips enclosing the hindpart of the ampulla, in *Anticoma* such lips are not seen, but only a straight limit.

It appears that in the males the caudal gland is more developed than in the females. In Pl. II, fig. 7 I have figured the anal region of a male where the named organ is rather spacious. Cephalad it passes the front end of the spicules and reaches to the level of the tube of the supplementary organ. It is divided in different parts and it is difficult to ascertain the number of its cells. Something like this I mean to have seen in stained preparations of

Enoplus communis, in which the limit for the gland can be ascertained quite exactly and where the caudal gland reaches farther in the males than in the females.

Phanoderma Bastian.

Phanoderma Steineri n. sp.

Pl. II, fig. 4: Pl. III, figs. 1, 7, 8.

Little Belt; off Lyngs Odde.

From the named locality there are 3 female specimens of a *Phanoderma* different from the species hitherto known. The length is 5 mm. The present species differs from the two species described by Bastian in respect to the shape of the tail, which tapers very slightly and is rounded in the tip; the form is nearly a blunt cone.

The cuticle is thick and smooth without transverse striæ. The shape of the body is slender and tapers gradually towards the front end; here it is furthermore restricted (Pl. III, fig. 8) and it ends in three, presumably, movable lips. I conclude that they are movable from the fact that their position is different in the different specimens. Each of the three lips is conical with rounded tip (Pl. III, fig. 8).

The buccal cavity is small, funnelshaped. There are two rings of bristles in the front end, the foremost consists of 3, one on each of the lips, and the hindmost consists of 6 bristles. Those in the hindmost ring are longer and stouter than those in the foremost. Fine hairs are scattered in various parts of the body f. i. in front of and behind the eyes. These consist of two heaps of brown pigment; no refringing bodies are seen. The eyes are situated at a distance of 48 μ behind the mouth.

According to de Man lateral organs are to be found in this genus; the named author writes in his paper dealing with Nematodes from the Bay of Naples, p. 14: „Immédiatement derrière ces soies naissent les sillons latéraux", and on the fig. 8, Pl. VIII these „sillons latéraux" are seen very plainly. In the Danish species I have not succeeded in finding such organs though I have examined my preparations very thoroughly in this respect.

Oesophagus, the structure of which is very peculiar, appears, seen in optical section, to be built up of circular disks. These

disks can be followed from the base of the œsophagus, where they are very prominent, till they grow smaller and more indistinct in the region of the nerve-ring; in front of this the œsophagus appears to be of usual structure. The histological interpretation of this fact can scarcely be attained by means of the usual glycerine-cleared preparations, my only recourse at present. Eberth is inclined to mean that each disc is a cell; he writes: „die äussere Wand der letzteren von ringförmigen Zellen gebildet, deren jede einen hellen Kern enthält." That the internal tube is rather spacious, especially in the hindmost part of the œsophagus, is plainly seen in my preparations, also the structure of the named discs seems protoplasmatic but I have not seen the nuclei mentioned by Eberth. The œsophagus is surrounded by a mantle of large cells looking rather cubic in shape and these cells are provided with a relatively large nucleus and nucleolus (Pl. III, fig. 7).

The ventral gland is found at the level of the base of the œsophagus, the excretory pore somewhat in front of the nerve-ring.

The female organs are symmetrical, the ovaries are reflexed. The vulva is found behind the middle of the body.

Length = 5,0 mm.

$\alpha = 59.$ $\beta = 5,5.$ $\gamma = 51,7.$

Dorylaimopsis n. g.

Anguillulidæ of small or medium size. The body is long and rather slender, tapering gradually towards the extremities. The cuticle is thick and consists of 3 layers; it is beset with circular points arranged in transverse rows; in the front part of the animal these rows grow successively more irregular and the points are here rather scattered over the surface. A system of larger points forms double-rows running in the longitudinal axis of the body. On the head the cuticle is smooth and thin and forms a transparent cap. The setæ are short and stout and arranged in one ring. Immediately behind this the large spiral lateral organ is situated. In the front end of the body is seen a spear, in shape not unlike that in *Dorylaimus* but of different structure. The spear is provided with highly developed protractor muscles running from its hindpart obliquely cephalad to the cuticle. Oesophagus, increasing

successively towards the base, does not form a true bulb. Ventral gland present. Vulva somewhat cephalad for the middle of the body. Female organs symmetrical. Ovaries not reflexed. Spicules rather long and of a peculiar shape, accessory pieces with backwardly projecting prominences (Pl. II, fig. 6). A median row of masculine papillæ is present. No supplementary organ. Postanally is found a longitudinal double-row of rather long and densely situated hairs.

Dorylaimopsis punctatus n. sp.

Pl. II, fig. 6; Pl. III, figs. 2, 3; Pl. IV, fig. 1.

The Sound; off Hellebæk. Shells and gravel.

Five specimens were taken, 2 females and 3 males. The length of the females is c. 3 mm; the males are somewhat smaller, c. 2,5 mm. The body is rather slender and tapers in front only gradually, except near the head where it tapers more quickly. In the posterior region it tapers very slightly; the tail is conical, provided with a slender tip which shows an extension with the excretory tube for the caudal gland (Pl. II, fig. 6). The head is provided with a single ring of short, stout setæ (Pl. III, fig. 2).

The cuticle is rather thick and proves to consist of at least two, possibly three layers. With low magnifying power is plainly seen a transverse striation; with high magnifying power are seen numerous rows of circular points occupying the entire surface. In the foremost part of the body the rows dissolve gradually and the points are here irregularly scattered. Something like this is known in several other marine genera e. g. *Chromadora*, *Cyatholaimus* and *Halichoanolaimus*. Another system of larger points forms double-rows running in the longitudinal axis of the body. These double-rows are four in number, arranged subdorsally and subventrally on each side. The distance between the two single-rows in each double-row attains 6 μ, the distance between the two points in a row is only about 1 μ.

On the head the cuticle is smooth, thin and forms a transparent cap.

The structure of the buccal cavity is very peculiar. With low power a spear like that of *Dorylaimus* is seen in the front end. In optical section and under high magnifying power is seen two parallely running chitinous, rod-shaped thickenings, one somewhat longer than the other. The front ends of these two „rods" are

united by means of a third chitinous „rod" running obliquely forward; but as the last named rod does not touch the ends of the two others the junction is not complete. To each side of the spear thus formed are inserted strong protractor muscles plainly seen in fig. 2, Pl. III. In none of my specimens the spear is protruded but I must believe that it can be protruded. I have no clear understanding of how the buccal cavity and the „spear" are to be interpreted; but I am convinced that the species in question is not related to *Dorylaimus* and that the likeness between the two genera perhaps is due to convergence. The length of the spear in *Dorylaimopsis* attains 27 μ.

The lateral organs are large and form a regular spiral. They are situated immediately behind the cephalic setæ.

The œsophagus increases gradually towards its base; near this it thickens more rapidly but a true bulb is not formed. A ventral gland is found at the level of the base of the œsophagus; the excretory pore is found about at the level of the middle of the œsophagus; an ampulla of the usual shape is found.

The vulva is situated somewhat in front of the middle of the body. Vaginal glands are present. The female organ is symmetrical; the ovaries are long but not reflexed.

The spicules are very peculiar. They are rather long and bent almost in a right angle somewhat above the apex. On the ventral side is found a hook-shaped prominence. Two accessory pieces appear to be present, one, very little, in front of the apex of the spicule, the other behind the spicule, large and provided with a backwardly projecting prominence (Pl. III, fig 3). Preanal papillæ are present in a number of c. 20; they are rather clavate in shape, very small and situated in the cuticle without projecting beyond it. Postanally rather long and densely situated setæ are arranged in two sublateral rows.

Female.	Male.
Length: 2,9 mm.	2,6 mm.
α = 29.	α = 35.
β = 8,2.	β = 6,7.
γ = 12,4.	γ = 12,3.

Sabatieria de Rouville.

Sabatieria dubia n. sp.

Pl. III. fig. 4; Pl. IV. figs. 3. 7; Pl. VI. fig. 5.

Limfjord; Skælholmen, 2—4 fms.

Little Belt; Kongebro, shallow water.

I have been unable to refer to any known species some specimens of a *Sabatieria*, taken on the two above named localities. As to the lateral organ they agree with de Man's *S. prædatrix* while they differ from it in other respects e. g. the shape of the spicules. It is smaller than the two known species, the female does not attain more than 2,5—2,9 mm, the male only 1,7 mm.

The external shape is typical for the genus in question; the body is rather slender and tapers gradually towards the front end; also in the posterior region it tapers but only very slightly. The tail is long and slender. The „head", limited from the anterior part by means of a restriction, resembles very much that of *S. tenuicaudata*. In the front end is seen a ring of quite short bristles, and behind this, at the same place as in *S. tenuicaudata*, is found another ring of considerably longer and stouter bristles.

The buccal cavity is very small, almost cup-shaped, provided with thickened chitinous walls; I have not been able to ascertain whether a dorsal tooth is present or not; at any rate it is very inconspicuous.

The cuticle shows a system of transverse rows consisting of minute points, as in the two known species, more like what is found in *S. tenuicaudata*, judging from de Man's figures. In this species the points are somewhat larger than in *S. prædatrix* and not so regularly arranged.

The lateral organ, as remarked above, is very like that in *S. prædatrix*; it consists of a spiral line combined with a broader spiral band, both running parallely unto the center of the spiral (Pl. III, fig. 4). I think the band must be a part where the cuticle is of a peculiar structure, but it is impossible to see how in the preparations.

The œsophagus expands gradually towards the posterior end: the intestine is crowded with granules.

A ventral gland is present; its pore is situated immediately behind the nerve-ring.

The female organs are symmetrical. The vulva is situated some-

what in front of the middle of the body. The spicules are strongly curved. An accessory piece is present, provided with a large backwardly projecting prominence. No preanal papillæ are seen. Postanally is found a double-row of rather stiff, on the cuticle vertically placed, bristles.

The tail is somewhat longer in the male than in the female, but of the same shape in both sexes.

Female.	Male.
Length: 2,9 mm.	2,7 mm.
$a = 38.$	$a = 38.$
$\beta = 9,0.$	$\beta = 11,8.$
$\gamma = 14,5.$	$\gamma = 9,6.$

Parasabatieria de Man.

Parasabatieria ornata n. sp.

Pl. III. figs. 5, 6; Pl. IV. figs. 5, 6.

The Sound; off Hellebæk, 15 fms, on shell-ground.

In 1907 de Man established the genus *Parasabatieria* for a species which differs from *Sabatieria* in the feature that the male is provided with preanal papillæ. In my material from the Sound is found a single male which I refer to de Man's genus; it is specifically different from *P. vulgaris* de Man.

The length of the animal is 2,2 mm, the shape is lengthened, strongly tapering towards the front end; here is found a considerable constriction which renders the foremost part perfectly like a head.

The cuticle shows a rather coarse transverse striation which partially seems to depend on the system of rows of circular points. In the species in question the single points are relatively large and the distance between the rows as well as between two points in the same row is relatively considerable. For the rest the named distances are varying in the different parts of the body; in the anterior end they appear to be smaller laterally than on the dorsal and ventral surface. In the anal region the points appear to be smaller ventrally than dorsally. Meanwhile it is very difficult to explain these features in some detail as it applies to very minute sizes; I estimate the distance between two of the transverse rows in the anterior part of the body to c. $^1/_4$ μ, but I am not able to state it with exactness.

Strange to say I have not been able to find any trace of bristles on the head of the animal. In the known species of this genus as well as in the closely related genus *Sabatieria* is usually found rather stout setæ but even by means of Zeiss Apochr. 2 mm I have not succeeded in ascertaining the presence of a single bristle in this region (Pl. III, fig. 5).

The most remarkable feature regarding this species is the lateral organ which is of an extraordinary size. It is situated on each side of the „neck" just at the level of the above named constriction. The width of the body measures here 16 μ and the diameter of the lateral organ is 14 μ, i. e. the two lateral organs almost touch one another dorsally and ventrally.

The buccal cavity is, as usual in Sabatieria, little and cup-shaped; in the species in question it is relatively flat; I was unable to find any tooth. The œsophagus increases slightly towards the posterior end, but there is no true bulb. At the base of the œsophagus is found a conical appendix situated at the limit between the former and the intestine and into which the chitinous intima continues (Pl. IV, fig. 5). The ventral gland is small and situated at the level of the base of the œsophagus. The excretory pore is situated immediately behind the nerve-ring.

The spicules are expanded proximally, tapering gradually towards the distal end; the latter does not terminate acutely but is provided with three minute teeth at the tip. A backwardly projecting accessory piece is found; it is strongly curved and encloses the spicules with its distal part (Pl. IV, fig. 6). Just as in de Man's *P. vulgaris* this species is provided with a series of preanal papillæ, which show a remarkable feature. They prove to be veritable secernating organs; on the ventral side is seen a median preanal row of glandular cells each of which is provided with an excretory tube; only near the ano-genital aperture the single glandular cells are fused together into a large glandular mass with more tubes, five in all. Together with these 14 excretory tubes in all are present.

Length: 2,2 mm.

$\alpha = 47.$

$\beta = 7{,}8.$

$\gamma = 9{,}5.$

Bathylaimus n. g.

Anguillulidæ of moderate size. Body very lengthened, filiform. Tail rather short, conical. The cuticle with very delicate transverse striation.

The front end is somewhat restricted, rounded and set with papillæ of a peculiar shape; they are domical and provided with a little acute tip. Behind the papillæ is a circlet of very long hairy setæ. The buccal cavity is funnel-shaped but very deep and narrow and it continues directly into the chitin-intima of the œsophagus; there are no teeth or chitinous prominences.

Lateral organs large and of the same type as in Cobb's *Dipellis typicus*.

The œsophagus is relatively short; it increases slightly towards the posterior end; there is no bulb. The nerve-ring is very indistinct. Presence of ventral gland not ascertained. Vulva situated behind the middle of the body. Female organs symmetrical. Ovaries reach far in the body; they are not reflexed. Vaginal glands present.

Male not seen.

Bathylaimus filiformis n. sp.

Pl. IV, figs. 2, 4, 8; Pl. VI, fig. 6.

The Sound; Hellebæk, on bridge-pillars. Among algæ.

Only one specimen was taken, a female, the length of which measures 4,2 mm. The body is very lengthened and it tapers only slightly towards each extremity; it has the same filiform shape as is known in *Eurystoma filiforme* (Pl. IV, fig. 2). Preserved the animal is rolled up in a spiral. The cuticle shows a very delicate transverse striation. It has been impossible for me to ascertain whether the named striation is due to rows of points or not, but I am inclined to mean that exceedingly small points are present. The front end is somewhat restricted at the level of the hindpart of the buccal cavity. The head is rounded and set with papillæ. These are of a peculiar, domical shape and terminate in an acute tip. As far as I have been able to ascertain the papillæ are arranged in two circlets but their exact position was not made out. Behind the papillæ is seen a ring of long and slender bristles (Pl. IV, fig. 8).

The buccal cavity is funnel-shaped but exceedingly deep and narrow and it continues directly into the chitin-intima of the œsophagus. It is devoid of teeth and chitinous prominences.

The lateral organs are large and of the same type as is known in Cobb's *Dipeltis typicus* and de Man's *Arœolaimus microphthalmus*; the organ forms a band-like figure, bent together with the two ends (Pl. IV, fig. 8).

The œsophagus is relatively short, about $^1/_{18}$ of the length of the body. It increases slightly towards the posterior end but does not form a true bulb. The nerve-ring is very indistinct.

The intestine is filled with large, refringing granules. Ventral gland seems to be lacking.

The vulva is situated a considerable distance behind the middle of the body, in my specimen 1188 μ from the anus. The female organs are symmetrical; the ovaries reach far in the body; they are not reflexed. Vaginal glands are present, all unicellular and provided with a large nucleus (Pl. IV, fig. 4).

Length: 4,2 mm. $\alpha = 134$. $\beta = 17,6$. $\gamma = 33,2$.

Halichoanolaimus de Man.

In 1888 de Man established the genus *Halichoanolaimus* for the species *Spilophora robusta* Bastian. de Man remarks that the named species of Bastian shows no affinity to the genus *Spilophora* but in the external shape as well as in the anatomical structure is very much like the genus *Choanolaimus*. *Halichoanolaimus robustus* appears to be rather common in Northern seas. Bastian found it at England, by Bütschli it was taken in the bay of Kiel and de Man took it at the coasts of Holland. In 1914 Southern found it at the coast of Ireland and finally it was taken by myself in the Little Belt. But till now it was the only known species belonging to the genus in question. Besides this species I have found in my material from Danish waters two other Halichoanolalmi, one from the Little Belt, the other from the Sound; and besides there is present in material from the Auckland islands, brought home by Dr. Th. Mortensen from his expedition to the Pacific a fourth species different from the named three. I am thus able to state that the genus *Halichoanolaimus* is widely spread and probably will prove to include many interesting forms.

The four species which I have now had an opportunity to study are of a very characteristic aspect due to the truncate head and

to the peculiar shape of the tail tapering strongly behind the anus to a thin filament which can be quite short as in *H. robustus*, but which can also attain a considerable length as in the species from the Sound, *H. longicauda*. Only in *H. Menzelii* the shape of the tail is not so well-marked as in the others. The buccal cavity is of the same type in all and does not appear to vary considerably.

A feature peculiar to this genus is its voracity; some of the species have proved to feed upon other Nematodes. I have found the intestine of *H robustus* filled with Nematodes in a more or less digested condition, and my fig. 4, Pl. XVI, shows two very characteristic corpora delicta from the intestine of the same species.

Halichoanolaimus robustus (Bastian).

1865. Spiliphera robusta Bastian, Monograph. p. 166.
1874. — — Bütschli, Zur Kenntn. d. freil. Nemat. p. 46.
1883. Halichoanolaimus robustus de Man, Quelques Némat. p. 38.
1914. — — Southern, Clare Island Survey. p. 24.

Little Belt; off Lyngs Odde, c. 30 m.
— Kongebro; shallow water.
— off Snoghøj.

Four specimens in all were taken at the above named localities.

Halichoanolaimus longicauda n. sp.

Pl. V, figs. 5, 7, 8; Pl. VI, figs. 3, 7; Pl. XVI, fig. 4.

The Sound; off Hellebæk, gravel and shells.

This species of which 7 specimens were taken, 4 females and 3 males, differs from *H. robustus* on account of its size, the female attaining 5,3 mm, the male c. 4,5 mm.

From the diagnose of the genus, given by de Man in 1888 it differs in so far as it is considerably long-tailed. But it is only the filament, in which the tail is terminating, that is long; the tail itself is of quite the same shape as in the species of Bastian. The named filament varies considerably in length in the different specimens and appears in more cases to have been exposed to molestation or injury. A male, the length of which measured 3,6 mm had a tail of 486 μ; in a female, 5,3 mm in length the tail

measured 293 μ and a young female in moult, the length of which was 2,7 mm, had a tail measuring 405 μ.

Beyond doubt the species in question is closely related to *H. robustus*.

The body is rather slender and the width practically the same during the whole length. It only tapers very slightly in front and not untill at the level of the buccal cavity.

The head is truncate just as in the known species. In the posterior part of the body it does not taper at all in front of the anal region; postanally it tapers strongly, and the tail, as remarked, continues in a long, thin filament, tapering gradually towards the tip (Pl. VI, fig. 3).

The cuticle shows a transverse striation, and as in *H. robustus* the deeper layer is set with points.

The front end, which resembles that of *H. robustus*, has very minute, short setæ, but I have not been able to ascertain their number and position (Pl. V, fig. 5). Also the buccal cavity is much like that of the known species; the anterior part is somewhat more flattened and more funnel-shaped as it tapers in width towards the posterior part, the chitinous rods of which appear to differ somewhat in shape from those in the species of Bastian.

The lateral organ is large and spiral-shaped.

The œsophagus is of almost equal width in its whole length. The intestine shows a strong pigmentation, a feature which seems common to errant forms to which the genus under consideration has to be referred.

A ventral gland is found on the limit between the œsophagus and the intestine, the excretory pore is situated at the level of the middle of the œsophagus.

The female organs are symmetrical. The place of the vulva is somewhat in front of the middle; several vaginal glands are present (Pl. V, fig. 7). Only 2—3 eggs are found in the uterus.

The spicules are rather strongly curved and do not terminate in an acute tip, but their distal end resembles a little comb with three teeth (Pl. V, fig. 8). Accessory piece rather small with furrows for the spicules. The preanal papillæ are very inconspicuous and only visible with immersion-lens. They seem to be few in number, perhaps 5, but I have not succeeded in ascertaining the number with certainty.

Female.	Male.
Length: 5,3 mm.	3,6 mm.
α = 46.	α = 37.
β = 7,4.	β = 5,5.
γ = [18].	γ = [7].

Halichoanolaimus Menzelii n. sp.

Pl. VI, fig 2; Pl. VII, figs. 1. 8.

Little Belt; off Middelfart, c. 30 m, clean sand.

A single specimen was taken, a male, the length of which measures 5,9 mm.

The shape of the body resembles that of the other species, belonging to this genus; it only tapers very slightly towards each extremity. While the width about in the middle of the body measures 80 μ it is at the level of the lateral organ 75 μ. The head is truncate. The tail does not taper so abruptly as is the case in the two other species. The cuticle shows, as usual in this genus, a transverse striation which, in the species in question, is rather coarse. Also transverse rows of minute points are present; they can be seen over the entire surface of the animal excepting the region of the lateral organ, where they are lacking.

The front end is provided with papillæ (?) and, in contradistinction to the two other species, with rather long setæ which presumably have the same position as the minute setæ in H. robustus. The shape of the buccal cavity is typical; the anterior part is of considerable width tapering somewhat posteriorly and the posterior part narrow andp rovided with stout chitinous thickenings. De Man indicates three thickenings for *H. robustus*; in the species under consideration I have with certainty seen four but I am inclined to mean that there are six in all (Pl. VI, fig. 2).

The lateral organ is spiral-shaped and rather large; the diameter attains 21 μ.

The œsophagus does not increase at all towards the posterior end and is of the same width throughout its whole length. The nerve-ring is very indistinct and it has not been possible to ascertain its place.

The intestine is crowded with brown pigment granules. I have not succeeded in finding the ventral gland; I presume that it is present but relatively small.

The spicules are slightly curved; they are provided with a longitudinal list and terminate distally with an acute tip. The accessory piece seems to consist of a median plate, which encloses the distal part of the spicules and is provided with two backwardly projecting apophyses. The ventral midline of the animal is provided with a long row of rather prominent preanal papillæ, 35 in all. They have a shape lik flat cups (Pl. VII, fig. 8).

Length: 5,9 mm.

$\alpha = 74.$ $\beta = 15{,}0.$ $\gamma = 33{,}5.$

Sphærolaimus Bastian.

Sphærolaimus hirsutus Bastian.

1865. Sphærolaimus hirsutus Bastian, Monograph. p. 157.

1907. — — — de Man, Quelques espèces nouv. &c. p. 55.

1914. Sphærolaimus hirsutus Southern, Clare Island Survey. p. 24.

Little Belt; Kongebro, shallow water.

The Sound; Hellebæk in S.E., 10—12 fms.

Only one specimen from each of the above named localities was found. None of them attains the size as indicates de Man for fullgrown individuals of this species. The female is 2,4 mm, the male 2,1 mm. Both are sexually developed and as they agree well in other respects with the description, I do not hesitate in referring them to the named species. Only one thing is to be pointed out, namely that the lateral organs of the male are remarkably small, scarcely larger than in the female. Possibly this is only an individual anomaly. After de Man the lateral organ of the male ought to be nearly twice the size of that of the female.

Sphærolaimus sp.

Pl. VII. figs. 2, 5.

Limfjorden; off Holmegaarde, shallow water.

A young specimen, not sexually ripe, the length of which attains 1,2 mm was taken. More reasons argue that it is another species than S. hirsutus. First: The shape of the buccal cavity differs somewhat from the named species (Pl. VII, fig. 2).

Further: the lateral organ is situated at a distance behind the buccal cavity nearly equal to the length of this. de Man remarks

in his description of *S. hirsutus* that the lateral organ in young specimens is situated more caudad than in fullgrown: „en arrière de la cavité buccale", but he does not give any measurement. A fact that decidedly indicates that it is a different species is the shortness of the œsophagus which only makes one fifth of the whole length of the animal: in contradistinction to *S. hirsutus* it increases somewhat towards the posterior end.

Length: 1,2 mm.

$\alpha = 28.$ $\beta = 5{,}0.$ $\gamma = 9{,}2.$

Sphærolaimus paradoxus n. sp.

Pl. VII. figs. 3, 4. 6; Pl. VIII. figs. 2. 3. 8.

The Sound; off Hellebæk, 10—12 fms.

In my material from the Sound I have two males and one female, all taken at the same locality and in the same draught. I am inclined to consider these three specimens as identic not only as to the genus but also specifically though the female in respect to the shape of the front end seems to differ considerably from the two males. It is possible that the front end of the female has been injured but more probable that it is really different in the two sexes.

At the first examination of the female I considered it as a form related to the genus *Halichoanolaimus* but generic different to it. Later on it was evident to me that the species under consideration in its anatomical structure — excepting the buccal cavity — was more closely related to the genus *Sphærolaimus* than to any other. I shall here point out: the length of the œsophagus, which is 3,7 of the whole length of the body, the circular lateral organ, the single uterus and the single ovary stretching forward in the animal, the posterior place of the vulva, the large vaginal gland situated immediately behind the vulva and — last not least — the feature that the cuticle is set with long, delicate hairs quite like those in the Spærolaimus hirsutus.

When regarding the front end of this female we see the head truncate (Pl. VIII, fig. 2) as in *Halichoanolaimus* and the buccal cavity divided in an anterior and a posterior part. The anterior part is large and cup-shaped, supported by longitudinal chitinous thickenings; the edge of the cup is considerably thickened and finely striated with vertical furrows, and it is bordered with a

membranous, finely jagged list. The posterior part of the buccal cavity is funnel-shaped, rather deep and narrow; on the edge of the funnel is seen three short and acute prominences which seem to be bent over the mouth of the funnel (Pl. VIII, fig. 2).

In the males are seen besides the same two buccal divisions mentioned in the female, but in front of these, two others, corresponding with what is known in *Sphærolaimus hirsutus* (Pl. VIII, fig. 8). Also in other respects the male shows relation to *Sphærolaimus* and is set with the same fine hairs as mentioned above.

After all: I must consider the female, as well as the male, as a true *Sphærolaimus* but I am not for the present able to settle the question whether the front end of the female has been injured or whether the two sexes are really different in respect to the shape of the front end.

The length of the animals attains, for the female 2,4 mm, for the male 2,3 mm. The shape of the body is much like that of *Sphærolaimus hirsutus* tapering only very sligthly in the front end and more in the posterior part of the body. The great length of the œsophagus is striking at the first glance; it attains a length between one third and one fourth of the whole length of the body.

The cuticle shows a delicate transverse striation, somewhat more prominent than in *S. hirsutus.*

The setæ of the front end are all exceedingly fine, about as fine as those which are spread, or arranged in longitudinal rows, over the whole animal; in my specimens it is not possible to indicate exactly their place. As known *S. hirsutus* has at the front end a circlet of stouter bristles, arranged in bundles, and, in his description of this species, de Man has exactly rendered account of their position; this is not possible on my preserved material. Besides these bristles fine long hairs are seen on the cuticle just as in *S. hirsutus* and perhaps still more abundantly than in that species. As stated by de Man these fine hairs are in *S. hirsutus* arranged in 8 longitudinal series, two dorsal, two ventral and two on each side; probably it is the same in this species.

As to the structure of the buccal cavity some differences between *S. hirsutus* and the specimen in question are to be pointed out. The two foremost parts are much like those in *S. hirsutus.* The third part differs conspicuously from the corresponding part

in the named species and resembles more the analoguous part of the buccal cavity of the genus *Halichoanolaimus*; it is shaped as a broad cup tapering posteriorly. The walls are thick and chitinized but they lack the crenelated surface known in *S. hirsutus*. The hindmost part of the buccal cavity is deep and funnel-shaped; it lacks the thick chitinous rods which are found in Halichoanolaimus and resembles more *S. hirsutus*. It is strengthened by thin longitudinal lists which meet in the bottom of the funnel and appear to continue into the chitinous intima of the œsophagus. The edge of the funnel is provided with three, rather short prominences terminating with an acute tip; these three prominences appear to be bent over the mouth of the funnel.

As to the shape of this fourth buccal division de Man states for the species *S. hirsutus* an asymmetry — the dorsal part being flat and more thick-walled than is the case laterally and ventrally; I have not been able to ascertain the like in the species in question.

As in *S. hirsutus* the lateral organ is circular. It is considerably larger in the male than in the female. In the female the diameter of the named organ measures 5 μ, in the male 15 μ.

The œsophagus is of equal width during its whole length excepting the front part which is somewhat extended and encloses the two posterior parts of the buccal cavity. The stout chitinous tube known in the œsophagus of *S. hirsutus* is not found in this species.

The intestine lacks the brown pigment characteristic for the *S. hirsutus*. The nerve-ring is very indistinct.

A ventral gland is present; it is rather small; the excretory pore is situated at the beginning of the second third of the œsophagus.

The spicules are much like those of *S. hirsutus*; they are rather strongly curved and of about the same width in their whole length. An accessory piece, on which the distal part of the spicules slides, is present.

The female organ is, as remarked, asymmetrical. The vulva is situated in the posterior part of the body, at the end of the second third. The ovary, which is not reflexed, reaches far into the anterior part of the body and passes the limit between the intestine and the œsophagus (Pl. VII, fig. 6). Behind the vulva is seen a rather large vaginal gland, consisting of a single cell (Pl. VII, fig. 3).

As to the female I shall give the following remarks. In the front end the body is truncate as in the genus *Halichoanolaimus*; the two foremost parts of the buccal cavity, described in the male, lack entirely. The head is bordered by a membranous, jagged list and does not convey the impression of being injured. Behind this list is found a chitinous ring provided with vertically situated furrows (Pl. VIII, fig. 2). In the male a similar ring is found but it is more slender than in the female.

After all it is at present impossible for me to ascertain whether the peculiar aspect of the female is due to injury or not. It is evident that this is a question of some importance because, as far as I know, no form of freeliving Nematodes is known in which a like dimorphism in the two sexes is stated.

Female.	Male.
Length: 2,4 mm.	2,3 mm.
$\alpha = 37.$	$\alpha = 49.$
$\beta = 3,7.$	$\beta = 4,4.$
$\gamma = 9,9.$	$\gamma = 9,7.$

Trigonolaimus n. g.

Anguillulidæ of medium size with elongate body, rather uniform in width. Cuticle relatively thin and smooth. The head is rounded and bears two rings of bristles. Lateral organs loop-shaped. Buccal cavity rather spacious and deep with thickened chitinous walls; in transverse section it forms a triangle and the shape is like a threesided pyramid placed on its top. In the foremost part of the buccal cavity is found a bundle of (6) stout, slightly curved chitinous rods arranged with their tips pointing cephalad. These rods are surrounded by chitinous, prismatic bodies. The rods can be protruded through the mouth and turned out in such a manner that their tips point backwards; when protruded the mentioned prismatic bodies are placed one behind each rod and supporting it. The movement here described is not due to an evagination of the foremost part of the body; the described bundle of rods is protracted and retracted by a special muscular apparatus; the lateral organs do not change their place during the process.

The œsophagus is rather short, increases gradually towards its

posterior end, but no true bulb is formed. The nerve-ring is indistinct. Ventral gland present; also unicellular glands are found with short chitinized, tubular canals penetrating the cuticle like those known in *Aphanolaimus aquaticus* and in the *Halaphanolaimus pellucidus*, described by Southern; they are only few in number, I have with certainty seen but two.

Female organs symmetrical, vulva is a short distance behind the middle of the body. Uterus contains only a few eggs. The spicules are strongly curved and expanded proximally. Accessory piece with a backwardly projecting prominence.

Trigonolaimus armatus n. sp.

Pl. VIII. figs. 1. 4. 6. 7.

Little Belt; off Middelfart, c. 30 m.
— off Lyngs Odde, c. 20 m.
The Sound; Hellebæk S.E., 12—14 fms.
— off Hellebæk, 12—14 fms.

The body is elongate, rather uniform in width. Near the front end it tapers gradually; the head is rounded. In the posterior part the body keeps its width to the anal region. The tail is short, conical, with rounded tip.

The cuticle is rather thin and smooth. Females as well as males keep the tail somewhat incurvate. The front end has two rings of bristles, those in the foremost ring are the largest (Pl. VIII, fig. 4).

The buccal cavity is large and rather deep with thickened chitinous walls; in transverse section it forms a triangle and the shape is like a threesided pyramid placed on its top. In the foremost part of the buccal cavity is found a number of stout, slightly curved chitinous rods arranged in a bundle with their tips pointing cephalad. Some chitinous, prismatic bodies are arranged in a ring outside of the named bundle. The number of the prismatic bodies is, as far as I have been able to ascertain, the same as the number of the rods, 6 in all. These rods can be protruded through the mouth and turned out in such a manner that their longitudinal axis is placed vertically to the longitudinal axis of the body and their slightly curved tips point backwards. In this position the rods are arranged like spokes in a wheel and the mentioned prismatic bodies are placed one behind each rod and supporting it (Pl. VIII, fig. 6).

The movement here described is not due to an evagination of the foremost part of the body; the rods are protracted and retracted by a special system of muscles; the lateral organs do not change their place during the process.

Unfortunately I have not had an occasion to study the movements of the rods on living specimens and consequently I am not able to state anything about rapidity or energy with which the named movements are performed. In my preparations are found specimens with retracted rods as well as specimens with the rods protracted.

The feature here mentioned recalls that of the genus *Ironus* about which de Man in 1884 writes that it differs from the other freeliving Nematodes „durch die eigentümliche Bildung des Kopfes und der Mundhöhle". Later on the same author has described a related genus from salt water, *Thalassironus*. In *Trigonolaimus* I suppose we have a parallel to the named genera, provided with protractile „jaws". I propose the name „jaw" for these organs, that is to say the same designation which I apply later on in this paper for the movable jaws in the genera *Enoplus* and *Enoplolaimus*. The well-known transverse striation of the œsophagus reaches in the species under consideration only to the level of the bottom of the buccal cavity; this latter is surrounded by another very complicated muscular apparatus, mainly consisting of pro- and retractors for the jaws and their supporting bodies.

The lateral organ is large, loop-shaped, of about the same aspect as is known in *Araeolaimus microphthalmus* de Man, in certain species of the genus *Dipeltis* Cobb and in the new genus *Bathylaimus*, established in this paper. In the species in question it is situated at the level of the foremost part of the buccal cavity which contains the jaws.

The œsophagus is short and increases gradually but slightly in its posterior half; no bulb is formed. The nerve-ring is very indistinct, I have not been able to ascertain its position in any of the specimens.

The intestine is crowded with minute granules.

Somewhat behind the base of the œsophagus is situated the ventral gland; the excretory pore is not seen. Besides the ventral gland some few unicellular glands with short, chitinized, tubular

canals penetrating the cuticle are found in the anterior part of the body; in structure they resemble those known in *Aphanolaimus* and in the genus *Halaphanolaimus* described by Southern.

The female organs are symmetrical; the vulva is situated a short distance behind the middle of the body. Two eggs are seen in the uterus. The spicules are strongly curved the proximal half forming about a right angle with the distal half; they are expanded in their proximal end. An accessory piece is present; it seems to form an eye through which enters the tip of the spicules(?); it is provided with a backwardly projecting prominence.

Female.	Male.
Length: 3 mm.	2,8 mm.
$\alpha = 47.$	$\alpha = 59.$
$\beta = 12,3.$	$\beta = 13,6.$
$\gamma = 47.0.$	$\gamma = 25,1.$

Trigonolaimus minor n. sp.

Pl. VIII. figs. 5, 9. Pl. IX. figs. 4. 5.

Limfjord; Skælholm, 2—4 fms.

On the above named locality was found a male of a *Trigonolaimus* which differs in some respects from the *T. armatus* so that I am inclined to consider it as a different species. As it is very like *T. armatus* it will be sufficient to point out the distinguishing characters, the more so because the single specimen at my disposal is in a rather bad condition.

The body is somewhat smaller than in the other species of this genus, the length being only 2,1 mm, but as I have measurements of only one specimen this difference is of very little importance; significant is the fact that the supporting chitinous pieces are wanting and that the spicules are more simple in structure which is easily seen on comparing the respective figures. Finally the position of the lateral organ is more posterior; in *T. armatus* it is situated at the level of the jaws, in the species under consideration it is seen at the level of the posterior part of the buccal cavity.

Length: 2,1 mm.

[$\alpha = 46.$] $\beta = 12,4.$ $\gamma = 21,7.$

Thoracostoma Marion.

Thoracostoma denticaudatum (Schneider).

Pl. I. fig. 9.

1866. Enoplus denticaudatum Schneider, Monographie. p. 58.
1874. Thoracostoma Schneideri Bütschli, Zur Kenntniss d. &c. p. 42.
1888. Thoracostoma denticaudatum de Man, Sur quelques Némat. p. 22.
1900. Thoracostoma denticaudatum Linstow, Fauna arctica I. p. 126.
1914. — — Southern, Clare Island Survey, p. 39.
1916. Thoracostoma denticaudatum Filipjev, Les Nématodes libres p. 88.

Little Belt; Middelfart, the pier.
— off Lyngs Odde, c. 30 m.

Altogether four specimens were taken, two males and two females. They are typical and agree well with the description of de Man. As the „tooth" on the tail of the male seems to vary in regard to size and shape I have figured the tail of one of the Danish specimens (Pl. I, fig. 9).

Besides the above named four specimens some young specimens are present from the Little Belt and from the Sound probably belonging to this species, but as the immature females of the genus in question are difficult to distinguish I cannot give a more exact determination.

Thoracostomopsis n. g.

I have found it necessary to establish a new genus for a form taken in Little Belt. In shape it is very like those Thoracostomes, which have the tail constricted before the tip viz. *Thoracostoma Strasseni* Türck, *Th. comes* Türck and *Th. acuticaudatum* Jägerskiöld. In some respects it also seems to be related to the named genus, the caudal gland being of quite the same structure and arrangement and the front end being covered by a „thorax" quite like that in *Thoracostoma*, but in other respects it appears to differ so considerably that it will be impossible to retain it under the same genus.

From *Thoracostoma* the form under consideration differs in

having the part of the front end covered with the thorax much narrower than the adjacent part of the body (Pl. IX, fig. 2); further in having the buccal cavity provided with a thin, acute spear to the proximal end of which the chitin-intima of the œsophagus is attached. Finally the bristles surrounding the head are highly developed and those in the hindmost ring exceedingly long and tentacle-like.

Thoracostomopsis barbata n. sp.

Pl. IX, figs. 2. 7.

Little Belt; off Snoghøj, c. 5 m.

Only a single specimen was taken, a scarcely mature female of a length of 6,3 mm. The body is elongate, tapering gradually in the front end but caudally keeping its width almost to the anal region. The tail is of the same shape as in *Th. acuticaudatum* Jägerskiöld. The cuticle is thick and smooth as in the genus *Thoracostoma*. The head is much narrower than the adjacent part of the body (Pl. IX, fig. 2) and covered with a thorax much like that found in the named genus. The hind-edge of the thorax is provided with deep incisions, dilated cephalad and reaching about to the middle of the thorax. The hindmost half of the thorax has its surface finely crenelated with numerous minute grooves rendering to it an aspect somewhat like shagreen. On the cephalad half of the thorax the surface seems to be smooth.

Near the very front end is found a single ring of ten stout setæ and behind these is situated in each of the thoracal incisions one very large, tentacle-like, bristle. Lateral organs are not seen in my specimen.

Very strange and difficult to understand is the structure of the buccal cavity. In the foremost part of the œsophagus is seen a chitinous tube (Pl. IX, fig. 2) which tapers gradually cephalad and continues into a delicate acute spear, in my specimen somewhat protruded and visible in front of the head. More caudad the chitinous tube is seen to be torn off its proximal end showing irregular contures, but where its base has been attached is not easy to ascertain. In the proximal part of the œsophagus is only seen the normal and intact chitin-intima and no fact betrays where the attachment can have been. In the very front-end of the body the spear is supported by short chitinous rods like the „klauenähnliche

Cuticularstücke der Mundbewaffnung" mentioned by Türck in *Thoracostoma*. In my specimens the rods seem to have the function to support the spear when protruded and retracted if so be that it, after all, is protrusile. The structure of the buccal cavity thus appears to differ highly from that known in the Thoracostomes and described by Türck.

The œsophagus increases gradually towards its base; the intestine appears to be almost entirely devoid of granules. The presence of a ventral gland is not ascertained.

The vulva is some distance behind the middle of the body; it is not very prominent and the chitinous thickenings known in the vagina of the Thoracostomes is not seen here.

The ovaries are symmetrical but not entirely developed in my specimen; therefore it is impossible to state wheter they are reflexed or not. Only two caudal gland-celles are visible; they are situated in the body cavity some distance cephalad to the anus just as in several Thoracostomes (Pl. IX, fig. 7).

Length: 6,3 mm.

$\alpha = 55.$ $\beta = 9,0.$ $\gamma = 26,0.$

Stephanolaimus n. g.

Anguillulidæ of medium size with coarsely striated cuticle. The striation tapers in the front end at the level of the hindpart of the buccal cavity. Surrounding the mouth is found a dilatation of peculiar aspect (Pl. V, fig. 3). Only one ring of bristles is seen, consisting of 4 long tentacle-like setæ, situated at the level of the base of the buccal cavity. Lateral organs are not present be it not that a ring of fine short logitudinal striæ surrounding the front end between the above named dilatation and the bristle-ring has to be interpreted in this manner. The tail, of medium length, keeps its width a long distance behind the anus; then it tapers gradually. The tip is devoid of annulation and provided with a smooth, refringing chitinous coat.

The buccal cavity is rather spacious, funnel-shaped, and entirely devoid of teeth or chitinous thickenings; it continues gradually into the lumen of the œsophagus. This is increasing towards its base but forms no bulb. Vulva behind the middle of the body.

This generic diagnosis can only be considered as provisional; beyond doubt it will require modifications and additions when more material can be procured. For the present the position of the genus appears rather isolated in the system.

Stephanolaimus elegans n. sp.

Pl. V, figs. 2, 3. Pl. VI, fig. 8.

Little Belt; off Lyngs Odde, 30 m.

Though only one specimen was taken, a young female not sexually developed, I have found it suitable to describe it here on account of its characteristic aspect which will permit its recognition in future. The length is 2,5 mm and the body is rather elongated and relatively narrow. Towards the front end it tapers gradually, in the hindpart of the body it keeps its width a long distance behind the anus which renders to the tail a peculiar aspect (Pl. VI, fig. 8). Its tip is covered by a smooth, refringing, chitinous coat (Pl. V, fig. 2).

The cuticle is coarsely striated, especially in the foremost part of the body where the aspect of the animal is almost annulated.

The front end is rounded and forms a constriction behind a dilatation of peculiar aspect (Pl. V, fig. 3). It is possible, but in my opinion not probable, that this dilatation consists of densely situated minute hooks arranged in a circlet and surrounding the mouth; it has not been possible to settle this question even by means of the highest magnifying power.

Only one ring of bristles is seen, consisting of four long, tentacle-like setæ situated at the level of the base of the buccal cavity.

Between the front end and the bristles is seen a ring of fine, short longitudinal striæ, perhaps lateral organs of peculiar structure.

The buccul cavity is rather spacious, deep and funnel-shaped without teeth or local chitinous thickenings; it continues gradually without any traceable limit into the lumen of the œsophagus. This is rather thin and increases gradually towards its base; its chitin-intima continues a short distance into the lumen of the intestine. No ventral gland is seen. The nerve-ring is indistinct.

The specimen is — as remarked above — a young, sexually immature female. A distance behind the middle of the body is seen the genital gland, not developed. Vulva is not yet formed.

Length: 2,5 mm.

$\alpha = ?$. $\beta = 7{,}2$. $\gamma = 10{,}6$.

Choniolaimus n. g.

Anguillulidæ of a rather peculiar form and of medium size. The body has about the same width throughout the whole length and recalls in shape the genus *Halichoanolaimus*. The front-end is — as in the named genus — truncate and behind the head is seen a constriction (Pl. VI, fig. 9). In the posterior part the body keeps its width unto the anal region. The tail is conical. The cuticle is composed of two layers and shows transverse striation. As far as it has been possible to ascertain the striation is restricted to the inner layer.

In the above named constriction of the front end is found a ring of 6 rather short setæ. The buccal cavity is funnel-shaped with rather strongly chitinized walls but without teeth. Lateral organs are large; each consists of a spiral of two and a half loops. The œsophagus is short and of uniform width except at the base where it forms a conspicuous bulb. Ventral gland is not seen.

The spicules are rather strongly curved; the proximal half (Pl. V, fig. 6) shows a slight dilatation; accessory piece (or pieces?) embracing the tip like a sheath. A row of 13 large cup-shaped papillæ is found in front of the ano-genital aperture.

Choniolaimus papillatus n. sp.

Pl. V, fig. 6; Pl. VI, figs 1, 4, 9.

The Sound; off Hellebæk, 12--14 fms.

The single specimen taken, a male of a length of 2,7 mm, is in a rather bad condition and shrunk to such a degree that it is not possible to give an exhausting description of it. But as several features are very characteristic it will be easy enough to recognize the species.

The body has about the same width throughout its whole length and recalls in shape the genus *Halichoanolaimus*. The front end is truncate and behind this is found a constriction (Pl. VI, fig. 9). Behind this constriction the body is somewhat dilated on account of the highly developed pharyngeal musculature and hereafter it tapers again in thickness. More posteriorly the body keeps its width unto the anal region. The tail is rather short and conical; it tapers rather quickly and the tip shows a dilatation with the excretory tube for the caudal gland.

The cuticle, which evidently consists of two layers, is trans-

versely striated. Under high magnifying power the striation is seen to be restricted to the inner layer. Only one ring of bristles is seen, consisting of 6 rather short, fine hairs, arranged in the usual manner; they are situated in the named constriction of the front end.

The buccal cavity is well developed, funnel-shaped and provided with chitinous thickenings of the wall, but there are found no teeth. The œsophagus is short and of equal width throughout its length except at the base where it forms a considerable bulb. Valvular apparatus is not seen in the bulb, but possibly there is a cavity as known in different genera viz. *Terschellingia* and *Spira*. The structure of the intestine could not be made out in my specimen; there is seen refringing granules and probably pigment granules, crowded together to brown spots. A ventral gland seems to be lacking.

The spicules are strongly curved; their proximal half is provided with a dilatation and possibly is found a longitudinal list.

In my figure (Pl. V, fig. 6) the proximal end of the two spicules is of a different shape the one being reflexed; presumably this fact is due to the preservation or perhaps owing to a deformity. Embracing the tips of the spicules is seen one or more accessory pieces.

A row of 13 large masculine papillæ is found in front of the anogenital aperture; each papilla has the shape of a little cup and in optical section it seems to contain a cavity in its interior; it is fixed to the cuticle with its rounded base and is projecting conspicuously beyond it (Pl. VI, fig. 1).

Possibly this form will prove to be related to *Chromadora*; there is a considerable resemblance in the structure of the papillæ, described by de Man in *C. macrolaimus* and *C. microlaimus* and the papillæ of *Choniolaimus maculatus*. The cuticle also shows likeness; it is striated transversally in *Choniolaimus* and with high magnifying power are seen fine points scattered over its surface; finally the œsophagus is provided with a well developped bulb. The structure of the buccal cavity does not show any important likeness; there is no tooth in *Choniolaimus*.

Length: 2,7 mm.

$\alpha = 57.$ $\beta = 13,0.$ $\gamma = 28,2.$

Demania Southern.

Demania gracilis n. sp.

Pl. X. fig. 6; Pl. XI. figs. 1. 3. 7.

In 1914 Southern in his paper dealing with Irish marine, freeliving Nematodes established a new genus which he named *Demania* after the Dutch nematologist de Man. Southern described two species which he referred to this genus, *D. major* and *D. minor*. The larger species attains a length of 8 mm, the smaller of $3^1/_2$ mm.

In the Sound, off Hellebæk were taken on shellground several specimens of a *Demania* the average length of which is about 5 mm, and which seems closely related to *D. minor*. On account of its size but principally owing to differences in the shape of the tail (Southern gives no figure of this organ) and in the shape of the spicules and perhaps in the buccal cavity too I have found it suitable, at any rate provisionally, to keep the Danish form specifically separated from *D. minor*.

The shape of the body is rather short and thick and appears to be somewhat stouter than in Southern's species. It tapers strongly towards both ends especially towards the front end. There is only one ring of 10 small but rather stout bristles; they are shorter than in *D. minor* but are arranged in the same manner.

The cuticle is smooth and thick; in optical section it measures 7—7.5 μ.

The buccal cavity is well developed and of the same shape as described by Southern in *D. minor*. The chitinous thickenings of the walls and the three „chitinous rods" (teeth?) in its posterior half seem to be of quite the same shape as in *D. minor* (Pl. X, fig. 6) and the three buccal papillæ have the same appearance as in the figure of Southern, l. c. Pl. VII, fig. 21 a. Surrounding the mouth is seen a chitinous wall, Southern's „transparent, circular membrane"?; presumably this wall consists of the low, fused lips.

Lateral organs are not seen.

The œsophagus, which shows a rather coarse transverse striation, surrounds the hindpart of the buccal cavity; at its base it projects somewhat into the lumen of the intestine. This is filled with refringing minute granules. The pigmentation is faint. Like Southern I have seen no ventral gland.

There are three caudal glandular cells the contents of which after Southern „are long and slender interwoven filaments presenting a characteristic appearance". I have not succeeded in observing these filaments in my specimens; perhaps my method of preservation has destroyed their peculiar structure.

Vulva is some distance behind the middle of the body. In a female, measuring 5,1 mm, the exat place of the vulva is 2,74 mm behind the frontend. The ovaries are symmetrical and reflexed. The spicules (Pl. XI, fig. 1) are slightly curved, expanded in the middle and provided with a rather strong longitudinal list reaching from the tip two thirds of the length of the spicule; its shape is rather different from that of *D. minor* figured by Southern; in its proximal end is found a little prominence to which the protractors are attached. An accessory piece of apparently rod-like shape is present.

The main differences between the Danish species and *D. minor* of Southern can be pointed out in the following manner: *D. minor* has a length of 3,5 mm, *D. gracilis* attains more than 5 mm. The tail of *D. gracilis* is more acute than that in *D. minor*. The spicules are of rather different shape in the two species. The Danish species seems to be more stout in shape, the tail perhaps somewhat longer.

Female.	Male.
Length: 5,1 mm.	4,6 mm.
$\alpha = 31.$	$\alpha = 35.$
$\beta = 7,5.$	$\beta = 6,9.$
$\gamma = 30,9.$	$\gamma = 20,4.$

Macrolaimus n. g.

Anguillulidæ of moderate size; body rather lengthened and slender. The cuticle is thin and smooth. The front end are surrounded by two rings of bristles; in the foremost ring are seen six, rather small, setæ; the hindmost consists of only four stout bristles of a length twice those in the foremost ring. The buccal cavity (Pl. IX, fig. 9) is very large with thin, chitinous walls; it is divided in two parts, one behind the other. The foremost part is the larger; it is funnelshaped and at its base are found some minute teethlike prominences. The hindmost part is globular and

separated from the foremost by a constriction; also in the middle of this part are seen some minute prominences, smaller than those in the foremost part.

The lateral organ is mediumsized and consists of a circle not perfectly closed. The œsophagus is almost of uniform width throughout its whole length. Ventral gland is not seen. Vulva is some distance in front of the middle of the body. The ovaries are symmetrical and reflexed (Pl. IX, fig. 6). Only one testis. The spicules are rather slender and provided with a chitinous list and a dilatation in the proximal end. Accessory piece large, consisting of an almost black, compact-looking chitine; it is provided with two long and slender apophyses.

Macrolaimus inermis n. sp.

Pl. X, figs. 1. 6. 8, 9.

Little Belt; off Middelfart, c. 30 m, clean sand.
— off Snoghøj, c. 30 m.
— Kongebro, among Hydroids.

The Sound; off Hellebæk, on bridge-pillars, among Algæ.

Limfjord; Tyborøn canal, 2—3 m.

Body rather slender and lengthened, uniform in width, attaining an average length of 3 mm. The tail is short and conical, tapering gradually towards the tip on which a dilatation with excretory tubes for the caudal glands. The cuticle is thin and smooth. The head is rounded and set with two rings of bristles, six medium-sized in the foremost ring and in the hindmost four, the length of which is twice those in the foremost ring. Surrounding the entrance to the mouth are found three low, transparent, rounded lips not unlike those known in the genus *Enoplolaimus* but less prominent. The buccal cavity is very large with thin chitinous walls; it consists of two parts, one behind the other, separated by a well-marked constriction (Pl. IX, fig. 9). The foremost part is much larger and broader than the hindmost; it is funnel-shaped and near its base are found some minute, teethlike prominences. The hindmost part is globular; in the middle of this part are also situated some minute teeth, smaller than those in the foremost part. Some longitudinal lines, appearing under high power, seem to argue that the transverse section of the buccal cavity is triangular but this I have not been able to ascertain.

The lateral organs are medium-sized and circular, but the circle

is open on one side (caudad); the shape is plainly seen in fig. 9, Pl. IX.

The œsophagus is somewhat expanded in front and with its musculature it embraces the largest part of the buccal cavity; for the rest it is of the same width and forms no bulb. The cells of the intestine are small and contain several pigment-granules. Ventral gland seems to be lacking.

Vulva is found somewhat in front of the middle of the body. The ovaries are symmetrical and relatively short; they are reflexed and the tips of the reflexed branches almost touch one another in the neigbourhood of the vulva (Pl. IX, fig. 6). Vaginal glands are not seen and vulva is very little prominent.

Only one testis is found. The spicules are slighily curved, expanded in their proximal end and provided with a short, longitudinal list. Also in the distal end is seen a dilatation. The accessory piece is of a rather peculiar aspect. It consists of a dark, almost black, opaque chitinous mass; it embraces the tip of the spicules and is provided with two backwardly projecting apophyses; on each side is found a prominence not visible in the figure. The accessory piece is very predominant in proportion to the spicules which consist of a colourless, highly pellucid chitinous mass.

Female	Male.
Length: 3,3 mm.	2,7 mm.
α = 41,7.	α = 41,9.
β = 5,9.	β = 4,9.
γ = 15,9.	γ = 16,5.

Macrolaimus gracilis n. sp.

Pl. IX. fig. 3; Pl. X. fig. 1.

Little Belt; the pier of Middelfart.

Only a single specimen was taken, a female 2,5 mm long. The shape of the body is much like that of the foregoing form; like this the specimen in question is rather slender and lengthened, of uniform width throughout its whole length; only in the front end it tapers rather quickly; the tail has almost the same shape as that of *M. inermis* (Pl. X, fig. 4).

The head is rounded and the cephalic bristles are arranged in two rings, but they are rather small; those of the hindmost ring are about twice as long as those of the foremost (Pl. IX, fig. 3).

The buccal cavity is considerably smaller than in *M. inermis*. In this species it measures in length more than 50 μ while in the species under consideration it only makes 19 μ. It is divided in two parts, one behind the other, but in *M. gracilis* the foremost part is relatively much larger than the corresponding part in the foregoing species, and besides it differs somewhat in shape. It is not funnel-shaped, the longitudinal walls being parallel, so that it can rather be called cylindrical, or more cylindrical than funnel-shaped. The hindmost part is globular as in *M. inermis*. Also in the species in question are seen some minute teeth, but only in the hindmost part of the buccal cavity. Caudad for this, at the entrance to the œsophagus is seen a large tooth-like prominence, a fact which calls to mind the fresh-water form *Trilobus gracilis*.

The lateral organ has quite the same shape as in *M. inermis*, but it is smaller and its place is more caudad (Pl. IX, fig. 3).

The œsophagus is cylindrical and expands but very slightly towards the posterior end. The intestine is crowded with refringing granules.

Vulva is found in front of the middle of the body. Female organs symmetrical, ovaries reflexed. No vaginal glands.

Length: 2,5 mm.

$\alpha = 52.$ $\beta = 8,5.$ $\gamma = 15,6.$

Chromadora Bastian.

Chromadora poecilosoma de Man.

1893. Chromadora poecilosoma de Man, Cinquième note &c. p. 16.

Little Belt; off Snoghøj, c. 30 m.

— Kongebro, shallow water.

Two females and one male were taken.

Chromadora maculata n. sp.

Pl. X, fig. 3; Pl. XI, figs. 2, 5.

Little Belt; off Lyngs Odde, c. 10 m.

Only one specimen was found, a female of a length of 2,0 mm. It has been impossible to refer it to any of the known species of this genus. The shape of the body is rather lengthened, like that of *Euchromadora vulgaris*; it only tapers very slightly in front, in the posterior part it keeps its width almost to the anal region.

In the neighbourhood of the vulva the body seems somewhat expanded possibly on account of some pressure of the coverslip.

The cuticle is rather peculiar. In the foremost part of the body, on the head, it is quite smooth and rather thick, but for the rest the annulation is very prominent and coarse. Under high power is seen a system of circular points or dots arranged in transverse rows (Pl. XI, fig. 5). In the foremost part of the specimen the dots are circular but more caudad they grow oblong having their longitudinal axis parallel with the longitudinal axis of the body; at the same time they appear to increase in number being more densely situated. The dots all seem to be almost of the same size; longitudinal rows with larger dots are not found in this species, a feature common in related forms. The tip of the tail is, like the front end, devoid of dots and annulation. The shape of the tail is seen fig. 3, Pl. X.

The head is provided with papillæ and more caudad is found a ring consisting of 10 bristles. Lateral organs seem to be lacking The buccal cavity is of the usual shape in this genus, the tooth medium-sized.

Oesophagus is rather thin in the greatest part of its length; posteriorly it forms a large oval bulb (Pl. XI, fig. 2).

Female organs symmetrical; the end of the ovaries is reflexed. Vulva is found in the middle of the body. No vaginal glands are seen.

Length: 2,0 mm.

$\alpha = 42.\quad \beta = 6{,}5.\quad \gamma = 15{,}5.$

Chromadora problematica n. sp.

Pl. X. figs. 5. 8: Pl. XI. fig. 9.

Limfjord; shallow water.

Only a single specimen, a female measuring 1.2 mm was taken. The body tapers inconsiderably in the front end; head truncate, in shape reminding one of the genus *Halichoanolaimus*. The cuticle is provided with a delicate transverse striation and with transverse rows of very fine points.

The head is set with a circlet of indistinct papillæ and behind this is found a ring of short, stout bristles. The buccal cavity is broad and cup-shaped in front, its hindmost part is funnel-shaped with its base continuing into the lumen of the œsophagus. Dorsal tooth very indistinct or possibly lacking.

The lateral organ is circular and situated at the level of the buccal cavity (Pl. X, fig. 5). Some distance more caudad is seen an eye consisting of a cup-shaped heap of black pigment granules; presumably this cup has contained a refringing lens, but this is not seen in the specimen. Behind the pigment cup is seen another less prominent heap of pigment granules.

The œsophagus is of uniform width during its whole length; there is no bulb. Ventral gland not seen.

Female organs symmetrical. The female pore is situated somewhat in front of the middle and appears to be an almost circular aperture (Pl. X, fig. 8). The ovaries are relatively short and reflexed. In the uterus only one shell-egg is seen. Cephalad and also caudad for the egg is seen a heap of densely crowded spermatozoa presumably included in the receptacles which are not distinct.

As it will be rather easy to recognize the species if met with later on I have included it in my descriptions. I have — when even with some hesitation — referred it to the genus *Chromadora*. It is possible that it ultimately will prove necessary to establish a new genus for this form.

Length: 1,2 mm.

$\alpha = 26{,}3$. $\beta = 7{,}8$. $\gamma = 11{,}2$.

Euchromadora de Man.

Euchromadora vulgaris Bastian.

1865. Chromadora vulgaris Bastian, Monograph. p. 167.

1886. Euchromadora vulgaris de Man, Anat. Unters. p. 69.

Kattegat; off Frederikshavn, c. 5 fms, on Halidrys.

Limfjord; off Holmegaarde, 0—1 fm.

— Ørodde, on bridge-pillars.

Tyborøn; 2—3 m.

All the specimens taken are females; they are all typical and agree well with the description of de Man.

Hypodontolaimus de Man.

Hypodontolaimus inæqualis Bast.

1865. Spiliphera inæqualis Bastian, Monograh. p. 166.

1888. Hypodontolaimus inæqualis de Man. Sur quelques Némat. p. 41.
1904. Hypodontolaimus inæqualis Jägerskiöld, Zool. Anz. p. 417.
1911. — — Ditlevsen, Danish freel. Nemat. p. 223.

The Sound; on bridge-pillars in Hellebæk, among Algæ.

Several specimens were taken. The specimens seem to be very euryhaline as it can be found as well in rather salt water as on localities, f. i. the Kalkbrænderihavn, where the seawater is strongly mixed up with fresh water.

Hypodontolaimus striatus n. sp.

Pl. X, fig. 2. Pl. XI, fig. 4.

The Sound; Aalsgaarde, on bridge-pillars.

A single female specimen was taken together with *H. inæqualis*. At the first glance it is to be distinguished from the named species on account of its short, stout shape. The length makes 0,9 mm.

The body is rather clumsy (Pl. XI, fig. 4); in front it tapers gradually towards the head, and even more towards the anus. At the level of the buccal cavity it tapers quickly, and the head is rather narrow. The tail is short and conical. The cuticle is striated transversally and provided with transverse rows of minute points. Longitudinal rows of larger points or dots are seen on each side of the body, giving it a striated aspect (Pl. X, fig. 2). In the very front-end just behind the mouth is found a system of longitudinal striæ like those found in *H. æqualis* and which is presumably due to an alternation of thicker and thinner regions of the chitinous wall which surrounds the mouth. Jägerskiöld compares this striation with the striation known in *Strongylus armatus*. The buccal cavity is nearly funnel-shaped. The tooth is well developed with its apex pointing dorsally. On the ventral side of the tooth is seen the entrance to the œsophagus. The chitinous thickening which in *H. æqualis* is found ventrally for the tooth is only little prominent in the species in question. The cephalic bristles are very short and delicate; I have not been able to ascertain their number and arrangement.

The œsophagus is short, of uniform width excepting posteriorly where it forms a large bulb with a conspicuous cavity in its interior (Pl. X, fig. 2). The nerve-ring is found at the middle of the œso-

phagus. Behind this is found an oval body on the ventral side, presumably the ventral gland; the excretory pore is found at the level of the large pharyngeal muscular mass. It is seen in fig. 2, Pl. X. The intestine is relatively narrow and filled with refringing granules.

Vulva in front of the middle. The female organ is symmetrical and the ovaries reflexed.

Length: 0,9 mm.

$\alpha = ?$. $\beta = 7{,}3$. $\gamma = 7{,}3$.

Desmodora de Man.

Desmodora serpentulus de Man.

1889. Desmodora serpentulus de Man, Troisième note &c. p. 188.
1916. — — Steiner, Freil. Nemat. a. d. Barentsee. p. 546.

Limfjord; Ørodde, on bridge-pillars.

Little Belt; off Lyngs Odde.

Two females, both typical, from the above named localities

Monoposthia de Man.

Monoposthia costata (Bastian).

1865. Spiliphera costata Bastian, Monograph &c. p. 166.
1874. — — Bütschli, Zur Kenntniss d. freil. Nemat. p. 45.
1889. Monoposthia costata de Man, Troisième note &c. p. 192.
1916. — — Steiner, Freil. Nemat. a. d. Barentsee. p. 553.

Limfjord; off the North-coast of Fur, 2—3 fms.

— Skælholmen, 2—4 fms.

Two females and a male were captured; they all agree well with the description of de Man.

Monoposthia constricta n. sp.

Pl. X. figs. 1. 7; Pl. XI. fig. 11.

The Sound; off Hellebæk, c. 20 fms.

Some young specimens of a *Monoposthia* specifically different as well from *M. costata* Bastian as from *M. mielcki* Steiner, were taken; all of them were sexually undeveloped.

The average length of the specimens from Hellebæk makes 0,8 mm. The body is somewhat stouter than in *M. costata*; in the front end it tapers gradually and the head is rounded and narrower than in the two known species.

The cuticle shows the feature typical for this genus with annulated constrictions and peculiar longitudinal lists. The number of longitudinal lists appears to vary in the different species; for *M. costata* de Man indicates 20 in the female, 19 in the male. The species of Steiner has only 6. In the species under consideration the number seems to be 10 or 8, at any rate in young, immature specimens.

The front end is set with a ring of papillæ and presumably bristles are also found, but I have not succeeded in finding such in any of my specimens. Nor have I been able to ascertain the presence of lateral organs.

The buccal cavity is deep and narrow and armed with the usual, dorsally situated, tooth. In all my specimens is found a replacing tooth in the tissue of the œsophagus such as is known from young individuals of *Ironus*, *Dorylaimus* and others — and also known in the genus *Monoposthia* as is mentioned and figured by Steiner in a young specimen of *M. costata* (l.c. Taf. 23, fig. 11 a).

The feature that at the first glance distinguishes *M. constricta* from the two species of the genus *Monoposthia* hitherto known is a sharp constriction which separates the proper musculature of the œsophagus from the foremost part which embraces the buccal cavity. In *M. costata* and *M. mielcki* such a constriction is not found; in *M. constricta* the named foremost part of musculature is egg-shaped and of a peculiar structure; the muscular and very prominent fibres are running obliquely cephalad; consequently it would be suitable to speak of a special pharyngeal musculature in this species which would be unnatural in *M. costata*. Excepting the mentioned foremost part the œsophagus is of uniform width untill its hind-part where a large bulb is found.

As my specimens are all immature it is impossible to describe the generative organs in some detail; not even the vulva is formed but it will, beyond doubt, prove to be situated some distance in front of the anus, a distance somewhat shorter than the length of the tail. In several of my specimens is seen at this place an in

conspicuous prominence like that in *M. costata* where the female pore is found.

The tail is short and conical (Pl. XI, fig. 11), ending with an acute tip. The transverse striation is lacking on its distal end.

Length: 0,8 mm.

$\alpha = 27.\quad \beta = 27{,}0.\quad \gamma = 11{,}0.$

Seuratia n. g.

This genus which I have named after the French nematologist Seurat in Alger is in my opinion closely related to the Cyatholaimi. It differs from the named genus in having the buccal cavity shallow and only very little spacious, devoid of tooth. In front of the preanal tubular supplementary organs, wellknown in the males of the genus *Cyatholaimus*, is situated a single much larger tube not unlike that found in certain species of the genus *Enoplolaimus*. The cuticle is striated transversally and provided with minute points arranged in transverse rows. Lateral organs spiral-shaped.

Seuratia gracilis n. sp.

Pl. V, figs. 1, 9; Pl. VII, fig. 7.

Limfjord; Ørodde, on bridge-pillars.

A single, male specimen of a length of 1,2 mm was taken. The body is slender and of about the same width in its whole length. Towards the front end it tapers very slightly and the head is truncate.

The cuticle is transversally striated and provided with a system of minute points only visible under high magnifying power and arranged in transverse rows. A single ring of short, rather stout bristles on the head (Pl. V, fig. 9).

The buccal cavity is shallow, cupshaped and no trace of a tooth is seen. Lateral organ is medium-sized, spiral-shaped; its diameter makes c. 6 μ. Some distance behind the lateral organ is found an eye-spot consisting of a heap of black pigment granules.

Oesophagus is of uniform width in its whole length. The nerve-ring which is very indistinct is found at the beginning of the hindmost third of the œsophagus. The intestine shows large refringing granules. Ventral gland is not seen.

The spicules are slightly curved and of uniform width. Accessory pieces rod-shaped and proximally acute.

Some distance before the ano-genital aperture is found a supplementary organ, in shape recalling that known in certain Enoploids, f. i. *Enoplus* (*Enoplolaimus*) *Bütschlii* Southern. The distance between this organ and the anus makes 104 μ in my specimen. Besides this organ and caudad for it are found three smaller supplementary organs quite like those known in the genus *Cyatholaimus* and situated between the ano-genital aperture and the above named supplementary organ (Pl. VII, fig. 7). The distance is almost alike between the three small organs; the distance between the foremost two makes 21 μ, between the hindmost two it makes 18 μ. The hindmost organ is situated 21 μ from the ano-genital aperture. The distance between the large supplementary organ and the foremost of the small organs makes 60 μ.

It has been impossible to refer the species in question to any known genus. It shows relation to *Cyatholaimus* but the structure of the buccal cavity is so different that it is impossible to include it here.

Length: 1,3 mm.

$\alpha = 40$. $\beta = 8{,}0$. $\gamma = 12{,}6$.

Cyatholaimus Bastian.

Cyatholaimus coecus Bastian.

Pl. XV, fig. 4.

1865. Cyatholaimus coecus Bastian, Monograph. p. 163.
1889. — — de Man, Troisième note. p. 204.
1916. — — Steiner, Barentsee-Nematoden. p. 586.

Little Belt; pier of Middelfart.

Some specimens were taken of a form which I venture to refer to Bastian's *C. coecus*. The size and other dimensions agree rather well with the description of de Man; only the annulation seems less coarse than it should be after de Man. The named author indicates one row of points in every interannulary furrow and three on each ring. I have not succeeded in ascertaining this in my specimens. The papillæ with chitinized base are, as in *C. coecus*, arranged in double rows in certain parts of the body. All my specimens being females I have moreover no support from the spicular apparatus which in this genus seems to be of systematic importance.

In the posterior part of the intestine one of my specimens

shows some Protozoan parasites (Pl. XV, fig. 4) of an aspect reminding one of small planarians: The front end(?) is truncate, the hindpart tapers quickly but is rounded. The length makes 66 μ, the width 14 μ. The ectoplasm is rather hyaline, the endoplasm is strongly vacuolated; no nucleus is seen. Six of these relatively large parasites are found in the intestine at the level of the vulva, one is seen in the hindmost part of the intestine just before the rectum. All the parasites are arranged with their front ends (?) pointing caudad.

I suppose they are gregarines of the group *Acephalinæ*.

Cyatholaimus microdon n. sp.

Pl. XI, fig. 10; Pl. XV, fig. 6.

Limfjord; Holme Flak, shallow water.

This species is easily distinguished from the hitherto described Cyatholaimi by its relatively long tail, the little, inconspicuous tooth and the extremely small lateral organ, situated behind the buccal cavity.

Only one specimen was taken, a female of the length of 1,2 mm. In the front end the body tapers gradually, the head is rounded (Pl. XI, fig. 10). The tail is of the usual conical form but relatively long (Pl. XV, fig. 6).

The annulation of the cuticle is very fine and the system of points more delicate than in any other *Cyatholaimus* which I have had occasion to examine. With the aid of Zeiss Apochr. 2 mm it was just possible to see the transverse rows of points where these were most prominent. The larger, chitinized bases of papillæ, so common in other species of this genus, seem to be lacking here; at any rate I have not succeeded in finding any.

The papillæ of the head are very indistinct; the cephalic bristles are short and rather slender. The buccal cavity is of usual shape, the tooth, as remarked, relatively small.

Lateral organ is spiral-shaped; it is small and consists of little more than two loops; the spiral line of the outmost loop does not end free but bends inwards to the foregoing loop (Pl. XI, fig. 10), a feature also known in *C. ocellatus*. Some distance behind the lateral organ are found two eyes each consisting of a cup-shaped pigment heap, but no lens is seen. The distance of the eyes to the front end makes 72 μ. The lateral organ is situated about in the middle between the front end and the eyes.

The œsophagus is of uniform width in its whole length. The nerve-ring is very indistinct; probably it is found some distance behind the middle of the œsophagus as in other species of this genus. No ventral gland is seen.

Vulva is found some distance in front of the middle. The female organ is symmetrical, the ovaries are reflexed.

Length: 1,2 mm.

$\alpha = 30. \quad \beta = 7,5. \quad \gamma = 10,7.$

Cyatholaimus macrodon n. sp.

Pl. XI. figs. 6. 8; Pl. XII. fig. 7.

Little Belt; off Snoghøj.

The Sound; off Hellebæk.

Several specimens of this species, males as well as females, were taken. The length makes for the females c. 3,2 mm, for the males 2,8 mm. The shape is rather slender. Towards the front end it tapers gradually, posteriorly it keeps its width almost to the anal region; the tail is rather short and conical, as usual in the Cyatholaimi.

The head is provided with low lips (Pl. XI, fig. 6) and on each lip is seen a papilla. The cephalic bristles are rather short. The buccal cavity is relatively spacious and deep and the dorsal tooth rather large and prominent.

The lateral organ is medium-sized and consists of a spiral of two and a half loop.

The cuticle is very finely punctated; the points are, as usual, arranged in transverse rows. Eyes are not seen.

The ventral gland, which is only small, is found at the limit between the œsophagus and intestine. The excretory pore is situated near the head; in a specimen, the œsophagus of which measures 43 μ, the excretory pore is situated only 18 μ behind the front end.

The vulva is found about at the middle of the body, commonly somewhat in front of the middle. The female apparatus is symmetrical; the ovaries are reflexed. Two shell-eggs are found in the uterus. The spicules are slightly curved, expanded in the middle and provided with a longitudinal list in its distal half. A large accessory piece is present consisting of a corpus which embraces the distal part of the spicules and is provided with some small spines; on each side is seen a long, backwardly projecting apophysis.

In front of the ano-genital aperture are found four supplementary organs; the three hindmost of these have a distance between each other which makes 18 μ; the distance between the two foremost makes 39 μ.

In the species in question is found a great number of long and filiform papillæ (Pl. XII, fig. 7). In the posterior part of the body are found two irregular rows of such papillæ in front of as well as behind the anus; some few papillæ scattered on the dorsal side of the tail are also seen.

Female.	Male.
Length: 3,2 mm.	2,8 mm.
α = 40.	α = 43.
β = 5,8.	β = 7,0.
γ = 15,8.	γ = 17,5.

Symplocostoma Bastian.

Symplocostoma longicolle Bastian.

Pl. XII. figs. 1. 3: Pl. XIII. fig 6.

1865. Symplocostoma longicolle Bastian, Monograph. p 133.
1888. — — de Man, Sur quelques Némat. p. 30.
1914. — — Southern, Clare Island Survey, p. 41.
1916. — — Steiner, Barentsee-Nematoden, p. 603.

Limfjord; off Holmegaarde, 0—1 fm.
— Ørodde, in Sphacellaria on Fucus.
— — on bridge-pillars.
— Skælholmen, 2—4 fms.
— Sallingsund, 3—4 fms.
— Fur Sound, 3—4 fms.
— Tyborøn, 2—5 m.
Kattegat; off Frederikshavn, c. 5 fms. On Halidrys.
Little Belt; off Lyngs Odde.
— Kongebro, on Hydroids.
The Sound; off Hellebæk, 10—12 fms.

Considering the great number of localities in which this species was taken, it is to be supposed that it is a common species in Danish waters. About fifty specimens are at my disposal and amogn

these no male is found; most of them are young individuals but a great deal are mature females containing shell-eggs in the uterus.

The Danish specimens agree well with the description of de Man so that I have not much to add. The ventral gland and its long excretory duct is much like that in *Enchelidium tenuicolle* Eberth; fig. 1, Pl. XII shows this. Like in *Enchelidium* the excretory duct is protoplasmatic in structure and a part of the secernating cell itself; also in *Symplocostoma* is found an ampulla near the excretory pore (Pl. XII, fig. 3), but it is not easy to ascertain whether the tube issuing from the ampulla is a formation originating from the cuticle as is the case in *Enchelidium*. In *Symplocostoma* are seen some streaks in the ampulla which could argue a valvular apparatus but it is impossible to see where the protoplasmatic structure ceases and the chitinized commences.

The caudal gland is — as supposed by de Man already in 1888 — found a great distance from the tail; three distinct glandular cells are seen (Pl. XIII, fig. 6), and in respect to their efferent ducts they seem to behave as the ventral gland. Each of these cells has its own duct of protoplasmatic structure which is a part of the protoplasma of the secernating cell itself. The three ducts may be followed to the tip of the tail where they open. De Man writes: „La glande caudale semble être située à quelque distance en avant de l'anus et se compose, à ce qu'il parait de deux ou trois grandes cellules ovalaires." On preparations stained with carm-alum or treated with osmic acid I have been able to ascertain the correctness of the supposition of de Man.

Eurystoma Marion.

Eurystoma filiforme de Man.

1888. Eurystoma filiforme de Man, Sur quelques Némat. p. 26.
1914. — Southern, Clare Island Survey. p. 41.
1916. — Steiner, Barentsee-Nemat. p. 602.

Little Belt; off Snoghøj, c. 30 m.

Only two specimens were taken, a male and a female; they are both typical and agree well with the description of de Man. Southern remarks that the tip of the spicules „has several teeth on the posterior edge". I find in my specimens the tip somewhat

expanded, but the teeth I have not been able to see even under high power.

Oncholaimus Bastian.

Oncholaimus vulgaris Bastian.

1865. Oncholaimus vulgaris Bastian, Monograph. p. 135.
1874. — — Bütschli, Zur Kenntniss. p. 38.
1914. — — Southern, Clare Island Survey. p. 46.
1916. Paroncholaimus vulgaris Filipjev, Les Nématodes libres. p. 46.

Little Belt; off Lyngs Odde.
Only a single specimen were found.

Oncholaimus fuscus Bastian.

1865. Oncholaimus fuscus Bastian, Monograph. p. 136.
1874. — — Bütschli, Zur Kenntniss. p. 39.
1886. — — de Man, Anat. Unters. p. 38.

Little Belt; off Snoghøj, c. 15 m.
— Kongebro, shallow water.
Several specimens were taken of this nice form.

Oncholaimus (Viscosia) langdunensis de Man.

1889. Oncholaimus (Viscosia) langdunensis de Man. p. 186.

The Sound; off Hellebæk, 15 fms. On shell-ground.
A male was taken on the above named locality.

Oncholaimus (Viscosia) glaber Bastian.

1865. Oncholaimus glaber Bastian, Monograph. p. 136.
1889. Oncholaimus (Viscosia) glaber de Man, Quatrième note. p. 184.

Limfjord; Skælholmen, 2—4 fms.
A single female was taken.

Oncholaimus de Mani n. sp.

Pl. XII, figs. 2, 4; Pl. XIII, fig. 2.

Little Belt; off Middelfart, c. 30 m, clean sand.
— off Snoghøj, c. 30 m.
Several specimens were taken, near Middelfart, together with

another beautifull form, *Enoplolaimus caput medusæ*, and also some few specimens were captured off Snoghøj.

The body is rather lengthened and slender; the length of the female attains 8 mm, the male only 6,7 mm. The tail is very short, conical and ventrally incurvate in both sexes.

The head is truncate and behind this, at the level of the base of the buccal cavity, is found a neck-like constriction. Caudad to this is found a slight expansion, containing the lateral organs. In the front end of the head are seen two crowns of papillæ, one behind the other. Where the head has its greatest width is found a ring of bristles, rather stout and mediumsized. On each side, just behind the lateral organ, is a single, slender bristle and moreover thin and long hairs are spread over the foremost part of the body. Also in the posterior part, præ- and postanally, several hairs are seen (Pl. XIII, fig. 2).

The buccal cavity is very spacious; it is considerably broader in the formost part. Caudad it tapers and shows a rounded bottom so that the shape is like a broad and deep cup. The three teeth are very unequal in size the one being much larger than the two others. In this species it appears to be the left, subventrally situated, tooth that is the largest.

The œsophagus, which is rather long, is of about uniform width throughout its whole length; in its musculature is seen a great number of minute, refringing granules apparently like those commonly found in the intestine.

The lateral organs are large and of a somewhat complicated structure. They are situated more caudad than seems to be the rule in the genus *Oncholaimus* where they generally are found at the level of the buccal cavity. In some respects they recall that in *O. fuscus*; as in that species is seen a duct that leads to the interior of the organ.

I have not succeeded in ascertaining the place of the pore for the ventral gland.

Vulva is found a considerable distance behind the middle, about at the beginning of the last third. It is rather prominent but no vaginal glands are seen. The female organ is symmetrical, the ovaries reflexed. Two shell-eggs are found in the uterus.

The spicular-apparatus is rather characteristic. The spicules which

are strongly curved have a dilatation in their proximal end; distally they are hook-shaped and the incurvate tip of the hook ends in an acute point. An accessory piece is present; it has a long caudad pointing apophysis and a shorter cephalad pointing prominence (Pl. XII, fig. 4).

Female.	Male.
Length: 8 mm.	6,7 mm.
$\alpha = 82.$	$\alpha = 83.$
$\beta = 7,4.$	$\beta = 6,8.$
$\gamma = 55,1.$	$\gamma = 52,5.$

Enoplus Dujardin.

Enoplus communis Bastian.

As this species is found in all tracts where I have been collecting, it will be of no use to enumerate all the single localities, many of these being near each other. I have taken the species in question in the Limfjord in the neighbourhood of Nykøbing and Fur and in the Sallingsund; in Little Belt it was taken near Middelfart, off Snoghøj, Lyngs Odde and at Kongebro; in the Sound it was taken off Hellebæk. Further I have specimens from Kattegat, off Frederikshavn and from Tyborøn, captured by P. Kramp and kindly forwarded to me.

I have hitherto not succeeded in finding the smaller species, *E. brevis* which, according to de Man, is found together with *E. communis* though I have paid attention to it.

Enoplolaimus de Man.

Enoplolaimus latignathus n. sp.

Pl. XII. figs. 5, 6: Pl. XIII. figs. 1. 3. 4. 7: Pl. XIV. fig. 2: Pl. XVI. fig. 3.

Little Belt; off Lyngs Odde, c. 30 m.

— off Snoghøj, c. 5 m.

Some few specimens of this species were taken. The length of the female makes 5,6 mm, of the male c. 4,5 mm. The shape is rather lengthened and slender, and the body is of almost uniform width; in the region of the œsophagus it tapers somewhat. The head is broad and of a shape that reminds one of *Sagitta* (Pl. XIII, fig. 1).

The cuticle is finely striated as usual in the Enoplolaimi but the striation is relatively coarse in this species The head is provided with rather strong cuticular thickenings, recalling that in the Thoracostomes; under high magnifying power the surface of these thickenings proves to be finely crenelated, like shagreen; among the minute elevated points are seen a few larger prominences. The lips are rather thin and pellucid.

The head is provided with two crowns of bristles; those in the foremost crown are short and pointing forward, those in the hindmost are long, slender and pointing sideways. Behind the head are found some fine hairs in a ring round the neck (Pl. XIII, fig. 1).

The buccal cavity is rather spacious and the jaws are exceedingly broad. Fig. 6, Pl. XII shows one of the jaws; in front are seen the two anterior teeth, which are inconspicuous in this species, in the middle is seen the median tooth, the base of which is rather extensive but the tooth itself is very little prominent in the species in question. On each side of the jaw, at the level of the median tooth, is seen an apophysis presumably for attachment of muscles. Fig. 3, Pl. XIII shows one of the jaws in profile; one of the anterior, lateral teeth and the median tooth are seen, the last one but little prominent; caudad for this is found one of the above named apophyses. To the base of the jaw is attached a rod-shaped, chitinous piece and behind the jaw (in the figure to the right for the jaw) is seen the chitinous skeleton that supports the tooth and keeps it on its place in the buccal cavity. I have not succeded in ascertaining whether the three jaws in this species are of quite the same shape and size.

The œsophagus, which is relatively, long is of uniform width in its whole length except in the front end where it is strongly expanded and embraces the hind-part of the buccal cavity with its mighty jaw-apparatus.

The female organs are symmetrical and the ovaries are reflexed. Vulva is found a long distance behind the middle, near the beginning of the last third of the body. The uterus shows a rather complicated structure; a receptaculum seminis is seen crowded with spermatozoans; vaginal glands are present (Pl. XIV, fig. 2). The spicules are short and thin. The accessory piece which embraces their distal end is relatively small. In this species no supplementary organ is found; it seems to be lacking entirely.

This species preys upon other freeliving Nematodes; in the intestine of a specimen I have found the entire skeleton of the buccal cavity of an *Oncholaimus* with the three teeth. Fig. 4, Pl. XVI shows this.

Female.	Male.
Length: 5,6 mm.	4,5 mm.
$\alpha = 70.$	$\alpha = 70.$
$\beta = 5,4.$	$\beta = 4,4.$
$\gamma = 22,0.$	$\gamma = 14,0.$

Enoplolaimus cephalophorus n. sp.

Pl. XIV, figs. 1. 5. 6; Pl. XV, fig. 1.

Limfjord; Holme Flak.

Little Belt; off Snoghøj, c. 5 m.

The Sound; off Hellebæk, c. 20 fms.

Several specimens were taken on the above named localities. The species is very easily recognized by its globular head (Pl. XIV, fig. 1). Both sexes seem to be of equal size, c. 3 mm in length. The shape is clumsy, especially in the female. The body is of the greatest width near the middle and tapers gradually towards both extremities.

The lips are large, hyaline and part of them striated, a feature known in other species of this genus e. g. *E. labrostriatus* Southern. The globular head is provided with three rings of bristles the two hindmost of which consist of very long and slender setæ; in my specimens these long setæ are irregularly bent in different directions which I suppose is not the case in the living animal.

The buccal cavity is very spacious and the jaws are medium-sized. The lateral teeth are rather prominent and situated near each other. The median tooth is relatively small.

The jaws seem to be highly movable what appears partly from the mighty pharyngeal muscular mass and partly from the site of the jaws in the different specimens. Besides the pharyngeal musculature three relatively large glands are found in the head; they seem to open into the jaws. The same three glands seem as a rule to be present in the species of *Enoplolaimus*, perhaps in all.

The part of the œsophagus lying behind the head is relatively narrow, but it increases in width and keeps then its width till the

base. It is, especially in its anterior part divided by constrictions into pouches reminding one somewhat of the large intestine in mammals. The nerve-ring is very indistinct, I have not been able to ascertain its place.

The female organs are symmetrical; vulva is found some distance behind the middle. Two shell-eggs are found in the uterus. Vaginal glands are not seen.

The spicules are exceedingly long and slender (Pl. XV, fig. 1), they are somewhat expanded in their proximal end; their length makes 264 μ. There are two accessory pieces each of which encloses the distal end of a spicule (Pl. XIV, fig. 5). Caudad for the ano-genital aperture are found two short setæ, one on each side of the median line. The supplementary organ is mediumsized, its distance from the ano-genital aperture makes 128 μ.

Female.	Male.
Length: 3,1 mm.	3,1 mm.
α = 36.	α = 39.
β = 4,8.	β = 4,8.
γ = 13,1.	γ = 17,9.

Enoplolaimus audax n. sp.

Pl. XIV. figs. 4. 7: Pl. XV. fig. 5.

The Sound; off Aalsgaarde.

Of this species only a single, male specimen was taken, the length of which makes 3,7 mm. The shape is rather slender and the body is of uniform width almost in its whole length. Near the front end is an inconspicuous expansion forming the head, and in the region of the ano-genital aperture the body is somewhat extended. The tail is of medium length and conical (Pl. XV, fig. 5).

The head is provided with three crowns of setæ; the first and second crown consist of short, rather stout setæ; the bristles of the third crown are situated about at the level of the middle of the jaws and are long and tentacle-like. At the base of the head is seen a fourth ring of bristles nearly half the length of the „tentacles". More caudad is found a great number of bristles, relatively long, serially arranged (Pl. XV, fig. 5). In the hind-part of the body, præanally as well as postanally are found several fine hairs (Pl. XIV, fig. 4).

The cuticle is very finely striated. The jaws are rather narrow, of about the same shape as in *Enoplus communis*, but the median tooth is rather well developed, medium-sized.

The œsophagus is of the usual shape in this genus, transversally striated and provided with pyriform glandular cells turning the pointed end towards the middle.

The spicular-apparatus is rather peculiar. The spicules are large and strongly curved, in about a right angle. The tip is set with backwardly pointing spines (Pl. XIV, fig. 4). The proximal half is considerably stouter than the distal half and is provided with a long, thin, cephalad pointing apophysis. In a distance, a little smaller than the length of the tail, exactly 178 μ before the ano-genital aperture, is found the supplementary organ with its chitinized duct (Pl. XV, fig. 5).

Length: 3,7 mm.

$\alpha = 57.$ $\beta = 4,8$ $\gamma = 14,5.$

Enoplolaimus dentatus n. sp.

Pl. XIII, figs 5, 8, 9; Pl. XV, figs. 2, 3; Pl XVI, fig 5.

The Sound; off Hellebæk.

I must confess that I am not able to divest my mind of the idea that the species in question will prove later on to be the species described by Steiner under the name of *Enoplolaimus hamatus*[1]) from the Barentsea. The spicular-apparatus seems to agree entirely with the description and figures of Steiner, and this organ especially seems to be of high systematic value within the Enoplolaimi. On the other hand certain features in the structure of the buccal cavity, especially of the jaws, in the species from the Sound are so characteristic and peculiar that I wonder whether they could have been overlooked by Steiner. The named author remarks, that his material of *E. hamatus* was in a very bad condition but there is no doubt that the jaws were present in his specimens as one is seen in his figure, l. c. fig. 32 b; its outline agrees rather well with the jaw I have figured Pl. XIII, fig. 5 but all the minute, teeth-like prominences, seen in the middle of my figure are lacking entirely in the figure of Steiner. It is, in my opinion,

[1]) Steiner: Freilebende Nematoden aus der Barentsee, Zool. Jahrb. Abt. f. Systematik &c. Bd. 39. 1916. p. 626.

not conceivable that the named prominences can fall off from the jaw even when the material is in bad condition; either the whole jaw would get lost or nothing, but the jaw is in situ in the figure of Steiner. Consequently I must presume that the characteristic prominences are lacking in the species from the Barentsea. Besides the difference mentioned, the two forms also differ in respect to size, my specimens being considerably smaller than those from the Barentsea. The average-size of the specimens from the Sound is 4,5 mm while Steiner indicates 5,6 mm for a full-grown male.

The shape of the body is rather lengthened, somewhat thicker in the middle, tapering gradually towards both extremities. There is no expansion in the front end, which tapers quickly; the head is nearly conical and rounded. The lips are well developed and dilated in the end. Only two rings of cephalic bristles are present, the foremost consisting of relatively short and stout, the hindmost of long and coarse setæ. Steiner indicates that in *Enoplus hamatus* each bristle in the hindmost ring is accompanied by a more slender and shorter bristle; this is not seen in the Danish species.

The buccal cavity is relatively spacious and the jaws are large and very characteristic in shape. I am unable to ascertain whether all of the three jaws have the same shape and size or not; it is a question that is difficult to settle in most of the Enoplolaimi especially in the forms where the jaws are large and broad. I have paid attention to this feature as de Man indicates for *E. vulgaris* that the jaws are not equal. In the species in question the two subventrally situated jaws at any rate seem to be equal in size and shape and, as remarked, they are large and broad. Fig. 5, Pl. XIII shows one of three jaws seen full face. The two lateral teeth are very prominent and consist of a hook fixed to the jaw by a short stalk; the median tooth is exceedingly large and acute. In the middle of the jaw is seen an oval field set wit numerous minute, teethlike, acute prominences. Fig. 8, Pl. XIII shows a jaw seen in profile; in this figure is seen the upper lateral tooth, the large median tooth and the small teethlike prominences. A supporting piece, rod-like with a sort of head, is seen in the left side of the figure.

The œsophagus has the usual shape and is of uniform width, a feature which seems to be the rule in this group.

Vulva is found somewhat behind the middle and is rather prominent (Pl. XV, fig. 3). Vaginal glands are present. The ovaries are reflexed. Receptaculum seminis, filled with spermatozoans, is found near the vulva, cephalad as well as caudad for this. The spicules are short, curved and expanded in the middle, the proximal end somewhat constricted. The accessory piece has a large backwardly projecting apophysis and embraces the distal end of the spicules (Pl. XIII, fig. 9). The supplementary organ is inconspicuous and found in a distance before the ano-genital aperture equal to about two third the length of the tail (Pl. XVI, fig. 5).

Female.	Male.
Length: 4,5 mm.	4,5 mm.
α = 45.	α = 45.
β = 5,0.	β = 5,0.
γ = 17,0.	γ = 15,3.

Enoplolaimus caput medusæ n. sp.

Pl. XIV, fig. 3; Pl. XV, fig. 7. Pl. XVI, figs. 1. 2.

Little Belt; off Middelfart, c. 30 m, clean sand.
— off Snoghøj, c. 5 m.
— off Lyngs Odde, c. 30 m.

Several specimens were taken. The length of the female makes c. 6,3 mm, that of the male c. 6 mm. The shape is rather lengthened and slender and the body is of almost uniform width during the whole length. There is no expansion in the front end and the head is rounded and nearly conical in shape. The lips are rather short, hyaline and rounded. The tail is rather long and conical (Pl. XVI, fig. 2).

The cuticle is very delicately striated as seems to be the rule in all Enoplolaimi.

The cephalic bristles are present in such a number and dimensions that I have not seen the like in any other Nematode, a feature which renders to the animal a characteristic and peculiar aspect (Pl. XVI, fig. 1). On the lips is found the usual crown of rather short or mediumsized bristles and behind these is seen another crown of larger and stouter setæ corresponding to what is usual in the genus *Enoplolaimus*. A third crown is found at the level of the proximal end of the jaws and these bristles, four in all, are exceedingly long and slender and remind one of tentacles in An-

nelids. Behind these, at the level of the base of the buccal cavity is a ring of four bristles of about the same length but nearly twice as thick, and also tentacle like; each of these bristles shows a circular field, in which it is fixed and a central string (nerve?) can be followed almost in their whole length. In my specimens the long bristles are, as said, like tentacles, an impression which is strengthened by the feature that they are bent irregularly in many directions as if they were flexible in the living animal. Each of the large bristles in the hindmost ring is accompanied by a slender, filiform bristle, that attains hardly half the length of the large. Caudad for the hindmost ring of large, tentacle-like setæ is found a ring, consisting of six groups of bristles; each group consists of three bristles of about half the length of the large. Between the described two last crowns are seen several groups of smaller bristles of different length, the arrangement of which is very difficult to ascertain. Owing to this rich supply of bristles the whole front-end of the body attains an aspect which justifies the name of *caput medusæ*.

As usual in this genus the buccal cavity is spacious; the jaws are in the species in question mediumsized; their median tooth is rather small.

The œsophagus is rather long and of about uniform width; only in the front end it is somewhat expanded. The nerve-ring is indistinct or rather invisible as in most of these forms. No ventral gland was seen.

Vulva is found behind the middle. The female organs are symmetrical and the ovaries reflexed. Vaginal glands are not seen. The spicules are short and thin; in their proximal end is seen a dilatation (Pl. XIV, fig. 3). An accessory piece, rod-like and slender, is present. The supplementary organ is only small, the chitinous duct is found c. 176 μ in front of the ano-genital aperture, a distance not attaining half the length of the tail.

Female.	Male.
Length: 6,3 mm.	6,1 mm.
α = 56.	α = 69.
β = 4,9.	β = 5,1.
γ = 17,0.	γ = 18,9.

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Explanation of plates.

Zeiss' microscope was used; in some cases Winkel's Homog. Imm. 2,$_2$ mm was applied.

Most of the figures were outlined with an Abbe-Zeiss camera lucida, some of them wih Winkel's drawing-eyepiece.

Reference letters for the figures.

exc. Excretory duct for the ventral gland.
int. Intestine.
p. Pigment.
v. Ventral gland.
va. gl. Vaginal gland.
vu. Vulva.

22—11—18.