49. Contributions to the Anatomy and Systematic Arrangement of the Cestoidea. By Frank E. Beddard, M.A., D.Sc., F.R.S., F.Z.S., Prosector to the Society.

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XI. On a new Tapeworm from *Œdicnemus*.

(Text-figures 141–149.)

Index.

In Prof. Fuhrmann's exhaustive list of Tapeworms * (of the Cyclophyllidea only) which occur in birds, only one parasite of this order is recorded from an *Œdicnemus*. The species in question is *Choanotænia coronata*, and it occurs in the European *Œdicnemus œdicnemus*. I was, therefore, particularly interested to find in a New World species of the genus, viz. *Œdicnemus bistriatus*, a number of examples of a tapeworm which does not belong to the genus *Choanotænia*, though it should probably be referred to the same family and even subfamily.

I shall, however, defer the consideration of the systematic position of this Cestode until an account has been given of its anatomical characters.

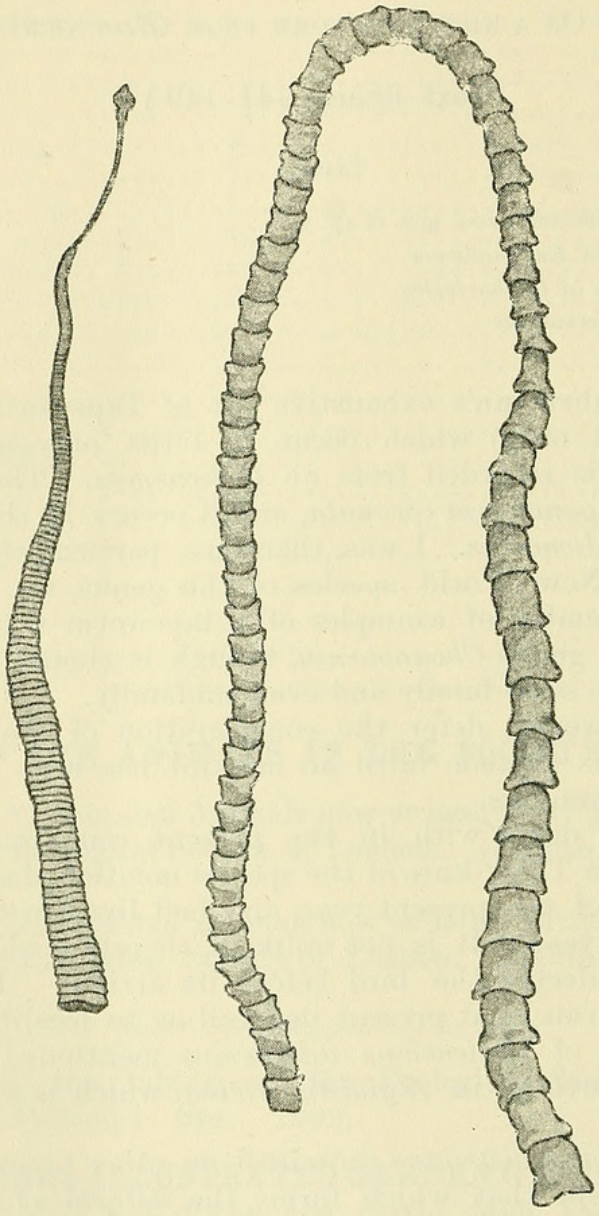
The species dealt with in the present communication was obtained from a Thick-knee of the species mentioned above, which died in April of the present year, and had lived in the Society's Gardens for a year. It is not unlikely, therefore, that the tapeworms had infected the bird before its arrival. But no fact of importance can be at present deduced as to locality, since the very parasite of *Œdicnemus œdicnemus* mentioned above has been also discovered in *Ægialitis nivosa*, which is an American bird.

The *Œdicnemus bistriatus* contained no other tapeworms in its intestine, except that which forms the subject of the present communication to the Society. I am not quite certain how many individuals there were; but there were at any rate six or seven. The worms are somewhat slender and measure at least 120 mm. I infer this from the fact that one of the largest fragments, consisting of both ripe and unripe proglottids, measured 110 mm.; but, as it had no scolex nor trace of the thin neck, at least 10 mm. may be added safely. The greatest breadth of the

* "Die Cestoden der Vögel," Zool. Jahrb. Suppl.-Bd. x., 1908.

ripe protoglottids is 2 mm. The accompanying figure (text-fig. 141) shows the scolex and anterior end of an example of this worm, as well as a portion of the posterior region of the same or of another example. The anterior part of the body shows the

Text-fig. 141.



Eugonodæum œdicnemi.

Portions of two examples about twice nat. size.

The left-hand figure shows the rather large scolex and whiplash-like anterior part of strobila. The right-hand figure consists of mature segments.

rather long and oval scolex followed by a slender neck which widens out rather suddenly. Only one specimen out of the six or seven which I have examined showed a gradual increase in

thickness from the neck onwards. This characteristic of the species is not unfrequently met with in tapeworms; it is, however, perhaps unusually strongly marked in this worm from *Œdicnemus bistriatus*.

The *scolex* is long and oval, and provided with four large suckers which possess no armature of hooks.

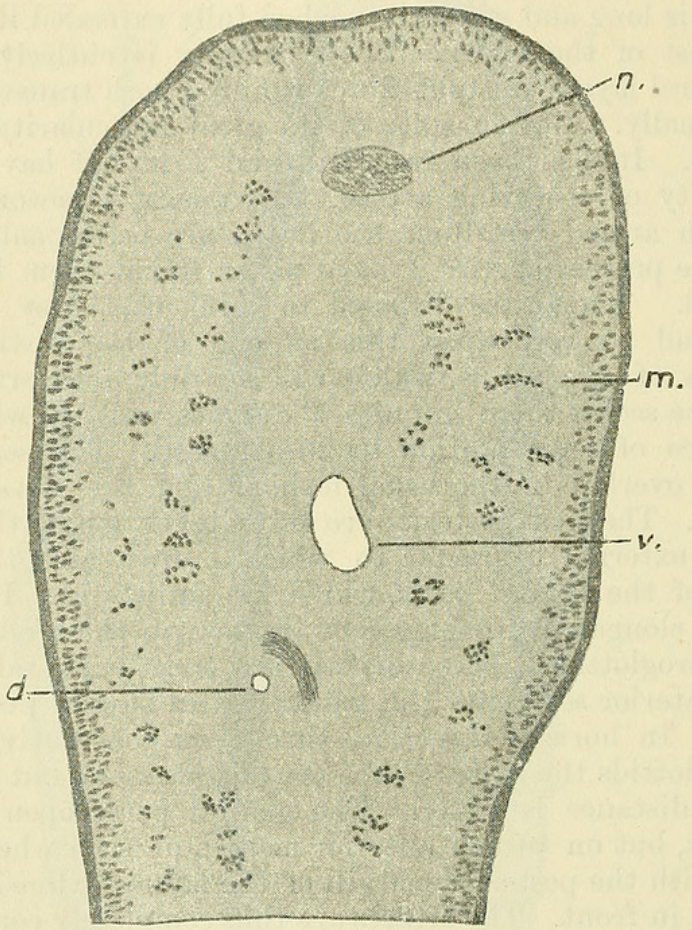
When the scolex and the rostellum are extended the suckers are quite in contact laterally. They are then oval in form. The *rostellum* is long and retractile; when fully extended it is as long as the rest of the scolex. The extremity is entirely muscular with several layers of stout fibres running both transversely and longitudinally. But in spite of its great muscularity there are no hooks. It has been recorded, and I myself have had the opportunity of observing a case, that among tapeworms which possess an armed rostellum, the hooks are occasionally absent. But in the present species I have never found them in a single individual. I am thus disposed to think that they are really absent, and to rely upon this as one of the distinguishing characters of the genus, which will be duly set forth later *. Behind the scolex there is quite a distinct neck, in which there is no trace of segmentation to be observed. The segments of the body overlap in the usual fashion and are never greatly elongated. The most posterior are only slightly longer than broad. The last external character to which I draw attention is the position of the *genital pores*, which are unilateral. In the ripe and more elongated segments they lie towards the hinder margin of each proglottid. These orifices are strictly lateral. In the narrow anterior segments the genital pores have a peculiar disposition. In horizontal sections through a consecutive series of such proglottids the edges of the proglottids stand out for a considerable distance laterally. The genital pores open on these extensions, but on to the anterior margin of each where it runs parallel with the posterior margin of the lateral extension of the proglottid in front. The orifices are thus completely concealed on a lateral view. In more mature segments these lateral extensions do not stand out in the same straight line with the rest of the segment, but become bent backwards; so that the anterior margin becomes lateral.

The structure of a proglottid is illustrated in text-fig. 142 (p. 864). The cortical layer is about as thick as the medullary layer. The former contains two rows of bundles of *longitudinal muscular fibres*; the number of fibres constituting each of the innermost bundles is greater than that of those of the outer. There appear to be a larger number of bundles also in the inner row. These longitudinal muscle-bundles do not extend outside of the nerve-cord; they are not at all closely arranged. The *water-vascular system* consists of two lateral tubes on each side, of which the outermost, or ventral, is several times larger in cross-section

* *Vide infra*, p. 877.

than the innermost, which I take to be the dorsal vessel. The tubes run nearly parallel to each other; but the dorsal vessel is slightly to the dorsal side of the proglottid. The ventral vessels are connected in each proglottid by a transverse vessel which is shown (in part) in text-fig. 143.

Text-fig. 142.



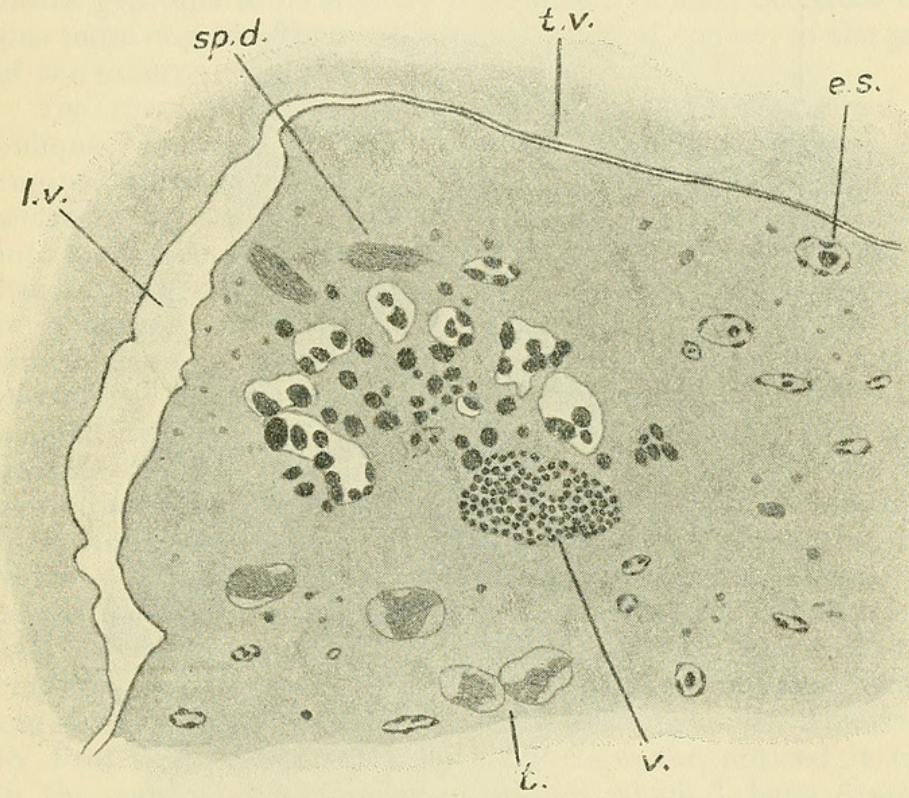
Part of a transverse section through a proglottid of *Eugonodœum œdicnemi*, to show the arrangement of the water-vascular tubes and of the longitudinal muscles.

d. Dorsal vessel. *m.* Longitudinal muscles. *n.* Nerve-cord. *v.* Ventral vessel.

The *ovary* of this tapeworm is single and not divisible into two lobes, as is so often the case. It lies distinctly to the pore side of each proglottid median of the large (ventral) water-vascular tube and partly ventral, as well as extending to both sides of the dorsal water-vascular tube. It lies in each case anteriorly in the proglottid, and not very far behind the transverse water-vessel of the proglottid in front. In front of the ovary, however, lie some of the coils of the sperm-duct; it is not, therefore, quite at the anterior margin of the segment. The vitelline gland lies behind the ovary and towards its inner (median) side. The relationship is shown in the accompanying drawing (text-fig. 143).

It will also be seen, on an inspection of that figure, that the fully grown ova are largely grouped together in cavities, and that the ovary is more or less hollow. I am not, however, disposed to think that this fact has any morphological significance. Two interpretations are, of course, conceivable. Firstly, that the space is cœlomic, the eggs having been freed from its walls into its cavity. The occurrence of a similar cavity in other tape-worms may perhaps be an argument in favour of this view, which is by no means impossible (and, indeed, has been theoretically demanded by Bergh and others); yet I am disposed to regard the

Text-fig. 143.



Part of a horizontal section through a proglottid of *Eugonodæum œdicnemi*.

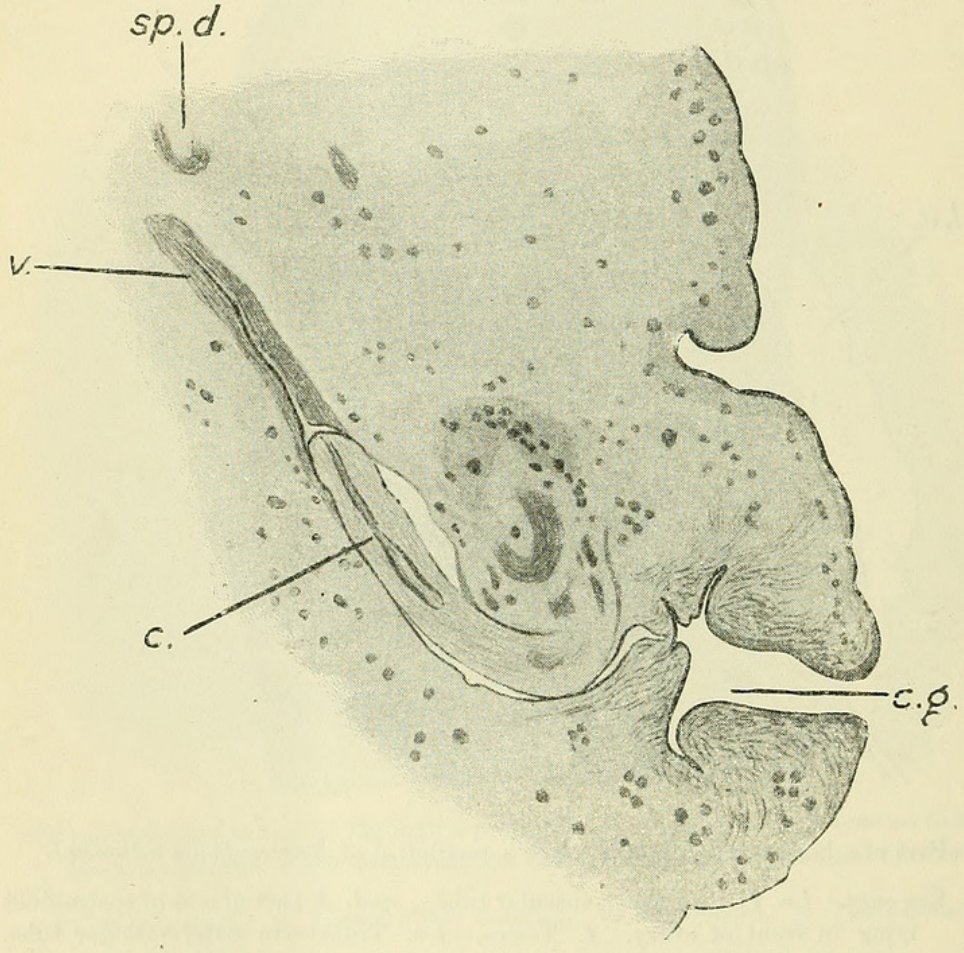
e.s. Egg-sacs. *l.v.* Ventral water-vascular tube. *sp.d.* A part of coil of sperm-duct lying in front of ovary. *t.* Testes. *t.v.* Transverse water-vascular tube. *v.* Vitelline gland; in front of this is the ovary, of which the darkly stained mature ova are partly received within cavities of the parenchyma.

cavities as merely due to shrinkage. These hollows might also be considered as the commencement of the uterus. The position, however, would be rather abnormal; and, moreover, as again is insisted upon later in this paper, ripe ova are already scattered through the parenchyma, the cavities surrounding which can therefore have nothing to do with the cavity in the ovary, whatever may be its nature. In younger stages than that which has just been described the ovary forms a quite solid mass. Later on it seems to disappear as a definite structure.

§ *Genital Ducts.*

This worm is characterized by the great depth of the genital atrium, which is much more developed than in most tapeworms and quite as much so as in any. The orifices of these follow in successive proglottids upon the same side of the body. In the ripe proglottids they are situated quite posteriorly and, therefore, the genital ducts which open into them run forwards towards the anterior region of the proglottid. The genital atrium, or genital

Text-fig. 144.



Part of a horizontal section through a proglottid of *Eugonodæum cædicnemi*, showing a generative aperture.

c. Cirrus extruded from cirrus-sac (shown lying in front of it) and received within vagina (*v*:). *c.g.* Very deep cloaca genitalis. *sp.d.* A coil of sperm-duct.

cloaca, is lined by a prolongation of the outer cuticle; outside of this is a very thick layer of rather stout muscle-fibres which, when the genital cloaca is cut through transversely to its axis, are seen to have a radial arrangement. The cavity is circular in transverse and oblong (more or less) in longitudinal section. At the base, where the genital ducts join it, it widens out and forms

a circular cavity projecting beyond the rest of the genital cloaca. The general shape is suggestive of a silk hat, if the brim of the hat were hollow. From the centre of the lumen of the genital cloaca a slender tube, which from its structure appears to be morphologically a part of the genital cloaca, leads to the junction of the male and female ducts. This is shown in text-fig. 144. It should be noted that the muscular layer of the cloaca genitalis is covered externally by a layer of subcuticular cells continuous with those which underlie the body cuticle. It is, therefore, perhaps to be presumed that the muscular layer in question is a local thickening of the delicate layer of fibres which underlies the body cuticle. Occasionally I have observed the cloaca genitalis to be slightly protruded ; in such cases the cavity was more cup-like than cylindrical owing, of course, to the gaping of the external orifice.

The sperm-duct and cirrus-sac, as already mentioned, pass obliquely forwards in the mature segments and are parallel to the vagina, which follows an identical course. The cirrus-sac in this worm is large and directed in a straight line towards its opening into a chamber in common with the vagina. This latter chamber has nothing to do with the terminal cloaca genitalis from which it is sharply marked off by the muscular walls of the cloaca, which have a narrow tube of intercommunication, doubtless capable of being widened. In all the individuals which I examined the cirrus of the fully mature proglottids was largely protruded from the cirrus-sac, but not through the cloaca genitalis to the exterior of the body. I found the cirrus, in fact, to be invariably inserted into the neighbouring vagina, which latter was as invariably filled with spermatozoa. There is, of course, nothing new in this record of self-fertilization, which is well known to occur among Cestodes, and has been recorded by van Beneden, Leuckart, and others. A large number of instances are given in Bronn's ' Klassen und Ordnungen des Thierreichs ' by Prof. Max Braun *. I have not, however, noticed it myself in the considerable number of species which I have examined, excepting in the present species. This auto-copulation is therefore far from being universal in occurrence. It appears to me, furthermore, that the structure of the efferent apparatus in the Cestode, which forms the subject of the present communication, may at times necessitate this auto-copulation. A closure of the cloaca genitalis coinciding with the eversion and protrusion of the cirrus would force the latter into the vagina, which is widened at its extremity, and does not project into the common chamber into which both efferent ducts open †. The passage for the cirrus is therefore not in any way hampered.

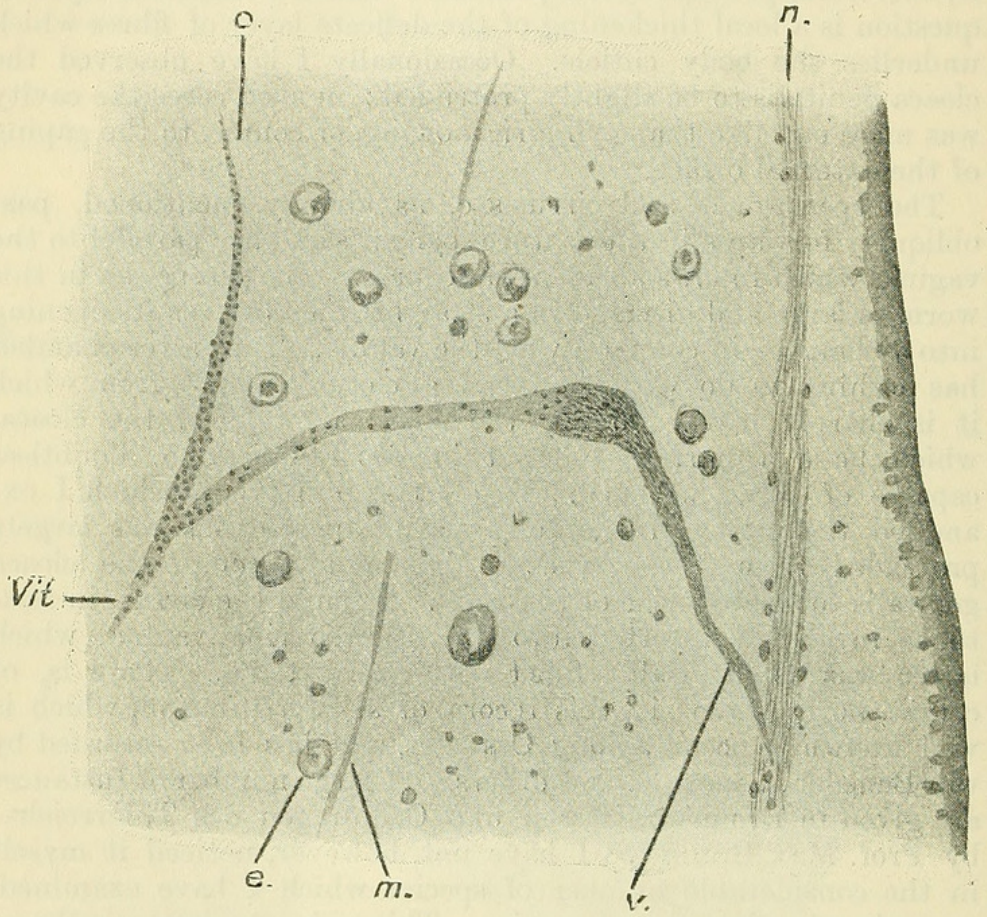
The cirrus-sac has thickened walls, as in so many species, and

* Bd. iv. Abth. 1, p. 1462.

† v. Janicki in describing *Schizotænia haymanni* (Zeitschr. wiss. Zool. lxxxi. 1906, p. 585), where there is also a very deep cloaca genitalis, comments on the mechanical necessity for auto-copulation on rather different grounds.

is somewhat bottle-shaped. The narrow region, however,—the neck of the bottle—is not anterior where the cirrus-sac opens into the common genital atrium, but posteriorly where the sperm-duct opens into it. I have not always seen this narrow backward prolongation of the cirrus-sac; but I have seen it in more than one case. There is no difference in its structure from that of the main part of the cirrus-sac *. The cirrus, as usual, lies coiled

Text-fig. 145.



Part of a horizontal section through a proglottid of *Eugonodæum œdicnemi*, to show further course of vagina.

e. Egg-sacs. *m*. Longitudinal muscle-fibres. *n*. Nerve-cord. *v*. Vagina, full of sperm and widening above to form a receptaculum seminis, thence bending back again to divide into the two usual branches *o*. & *Vit*., which are arranged in the same straight line with each other.

within the sac and when protruded, as shown in text-fig. 144, is broader at the protruded end. This is inserted into the vagina, the proximal dilatation of which it completely fills, as is shown in the same figure. The sperm-duct, after leaving the cirrus-sac, runs in a straight or slightly sinuous course, at first quite parallel

* It is possibly temporary, and due to unequal contraction.

to the vagina on the anterior side of it. It does not expand anywhere into a vesicula seminalis, but forms a large coil. This coil lies in the neighbourhood of the two water-vascular vessels.

The *vagina* opens behind the cirrus-sac and is wider, and with more muscular walls in that section which lies close to the external pore than elsewhere. It is this region which receives the cirrus during the auto-copulation referred to above. The tube then becomes finer and passes parallel to the sperm-duct, as shown in text-fig. 144. At about the level of the larger, ventral, water-vascular tube it expands into a not very large *receptaculum seminis* (text-fig. 145), which in fully mature proglottids is gorged with sperm. From this point in fully mature segments the vagina then bends back again and divides into two tubes, one running anteriorly and the other posteriorly. In less fully mature proglottids the course of the whole vagina is straight and but slightly oblique, being nearly parallel to the transverse axis of the body. The shell-gland in such segments is very plain.

§ *Egg Sacs.*

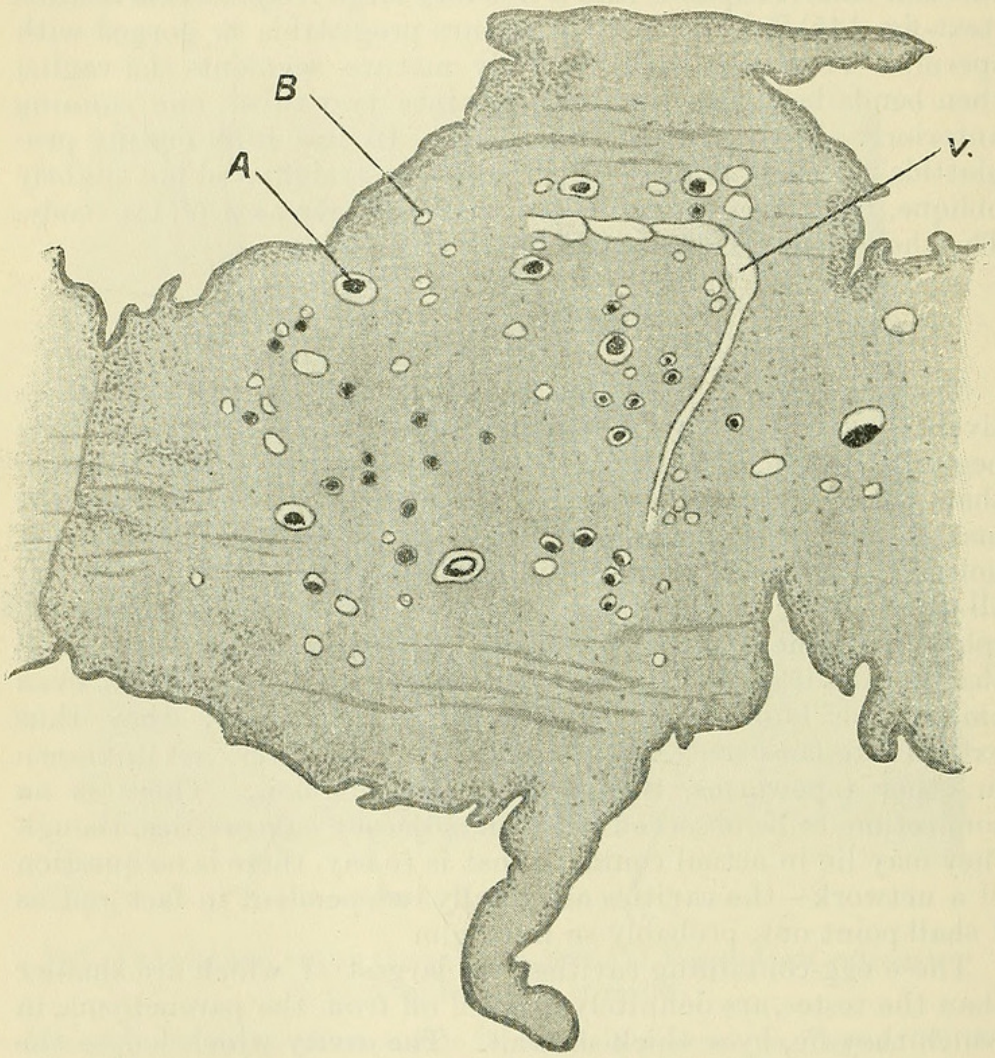
The egg-containing cavities (which do not, as I think, collectively represent a uterus) occur in segments which have already begun to lengthen slightly, although they are still much broader than long. In such segments the ovary and testes are fully mature, but show no signs of degeneration. Several of these egg-holding cavities are displayed in text-fig. 143 (p. 865). They are all small, but not of uniform size; their shape is quite uniformly spherical. There is no regularity of arrangement among them that I can detect; they lie everywhere in the proglottids, even among the bundles of longitudinal muscle-fibres; they thus extend into the cortex, a position which is, however, not unknown in other tapeworms, though it is not common. There is no connection to be observed between adjacent egg-cavities, though they may lie in actual contact: that is to say, there is no question of a network—the cavities are totally independent in fact and, as I shall point out, probably so in origin.

These egg-containing cavities, the largest of which are smaller than the testes, are definitely marked off from the parenchyma, in which they lie, by a thickish wall. The cavity which lodges the egg* and the vitelline cells is naturally more apparent in the case of the larger sacs. In the smaller ones the egg and accompanying cells fill up the available space completely or nearly completely. The inference appears to me to be that the cavity is formed later perhaps by the exudation of fluid as well as growth of the periphery in a way similar to that of the mammalian Graaffian follicle. On the other hand, the structure of the walls of these egg-containing cavities suggests another interpretation. As already mentioned, they are rather thick and thus very conspicuous: in

* Occasionally two eggs are found in the same cavity.

them occur numerous nuclei sometimes close together and sometimes more sparsely arranged. These nuclei are more numerous in the larger egg-holding spheres, and would thus seem to have multiplied during a growth. But it must be admitted that the existence of sacs with the lining apparently epithelial is highly suggestive of a state of affairs like that shown by *Dipylidium caninum*.

Text-fig. 146.



A horizontal section through mature proglottid of *Eugonodæum œdicnemi*.

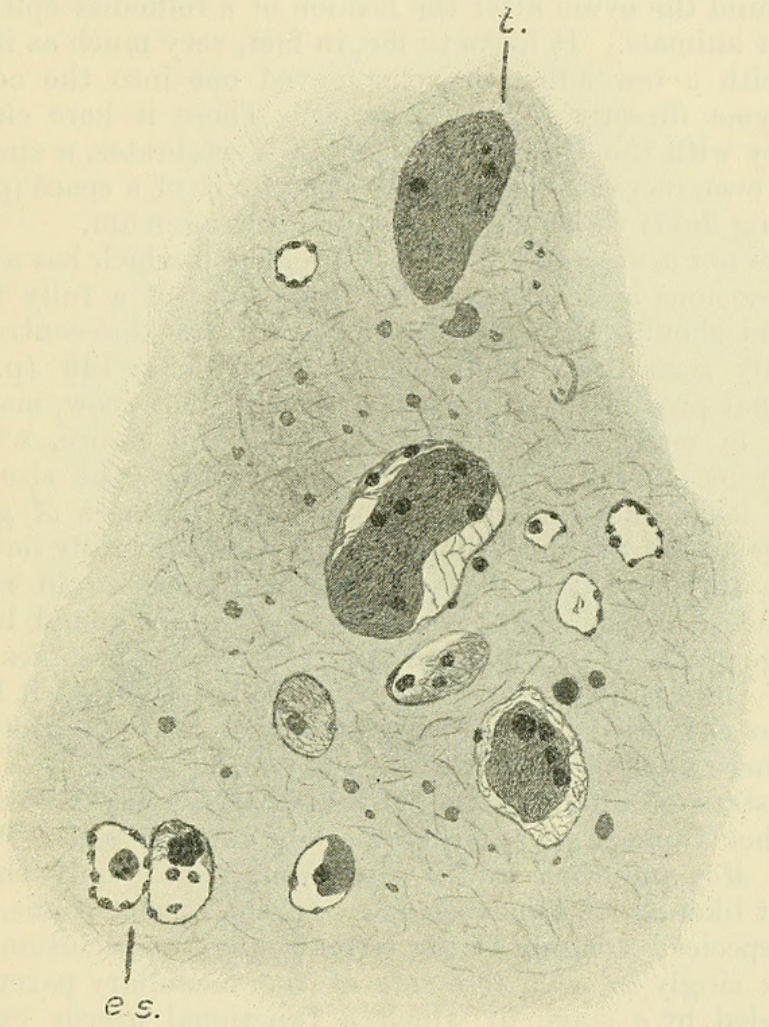
A. Advanced embryo in egg-holding cavity. *B*. Less advanced embryo in smaller cavity. *v*. Ventral water-vascular vessel giving off transverse vessel.

In this worm, as is well known *, the uterus finally breaks up into numerous quite separate cavities, in which lie many ripe ova, and which are lined by a continuous epithelium. The arguments against this supposition, however, outweigh those in

* *Cf. e. g.* Beddard, P. Z. S. 1913, p. 555 text-fig. 88.

its favour. In the first place there is no trace that I can discover of a pre-existent uterus*, whose subsequent fragmentation might produce the result described above. Furthermore, the actual cavities of the egg-holding apparatus are a later development, or at any rate they increase in extent as the eggs within them grow. Indeed it may, I think, be safely asserted that in the youngest

Text-fig. 147.



Part of the section illustrated in text-fig. 146 more highly magnified and showing younger egg-sacs in parenchyma (*e.s.*) and testes (*t.*), which are very much larger.

groups of egg and surrounding cells there is no free space at all. Nevertheless it might be said that all this was due to precocious development, that in fact the rapid protrusion of ripe eggs from the ovary had outstripped the growth of the uterus, which in consequence appeared subsequently in point of time, and that

* *Cf.*, however, p. 865 under description of ovary.

the uterus for this latter reason appeared in an already divided condition.

It is to be noted that egg-sacs of the character just described occur in the younger proglottids, and that they are also to be found (text-fig. 143, p. 865) in quite young proglottids, in which the ovary and vitelline gland are at their full development and have not commenced to degenerate. Without having any positive proof, I am disposed to think that the cells which encircle the ovum are ovarian or vitelline gland-cells*, which come to be disposed round the ovum after the fashion of a follicular epithelium in higher animals. It looks to me, in fact, very much as if a ripe ovum with a few adherent cells moved out into the adjacent parenchyma directly from the ovary. There is here clearly a similarity with the Graaffian follicle of Vertebrates, a similarity which is even increased by the later appearance of a space (perhaps containing fluid) which surrounds the growing ovum.

It does not always follow that a proglottid which has attained the dimensions and acquired the appearance of a fully mature proglottid should contain only embryos. On the contrary, as be readily seen from an inspection of text-fig. 146 (p. 870), a large flat proglottid, quite as large as it will grow, may have egg-sacs in many stages of growth. In this figure, which is drawn from a section seen under a low power, the size of the egg-sacs is a rough measure of their relative stages of growth. The largest are of course the oldest, and contain fully developed embryos surrounded by a thick shell and enclosed in rather a large space. Intermediate conditions are to be found between this stage and that in which an undivided ovum occupies all the space of the cavity of the body-parenchyma in which it lies. I have also cut sections of apparently fully mature proglottids, in which there were no advanced embryos.

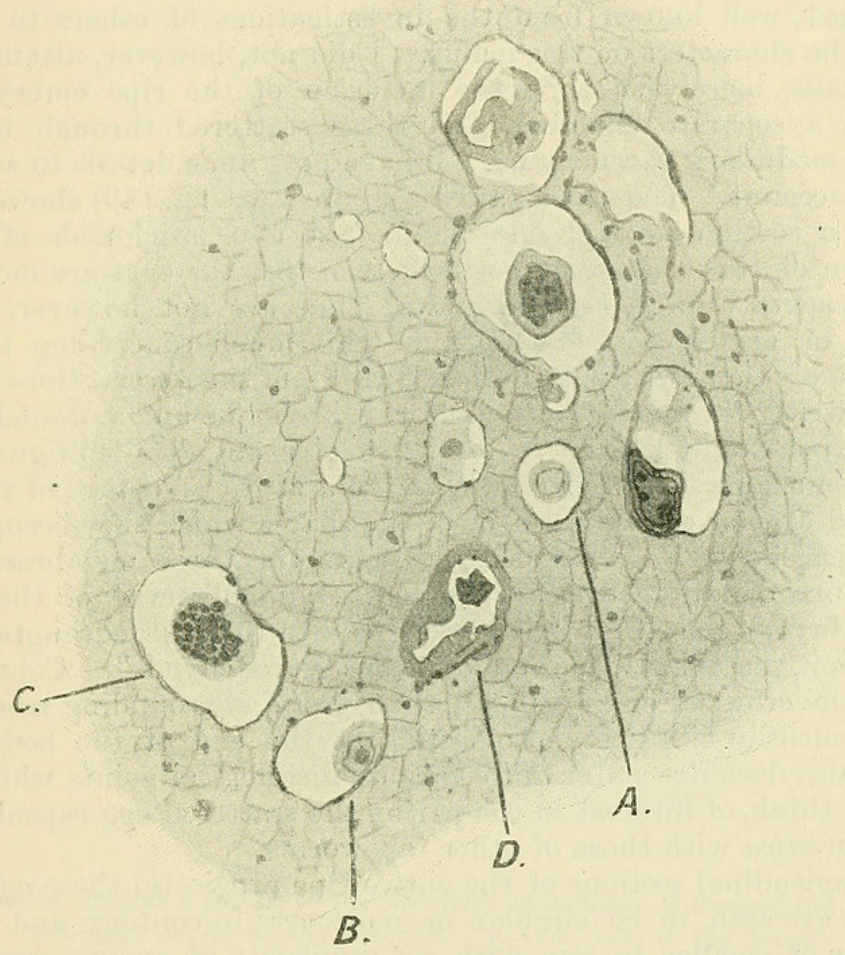
This state of affairs is not unlike what has been described in some other Tapeworms by others as well as by myself. We may exclude *Monopylidium* and *Dipylidium*, which only show an apparent likeness to *Eugonodœum*. In the former genus, and in certain species belonging to the latter genus, the inclusion of the ripe ova singly in compartments of the medullary parenchyma is preceded by a stage in which a functional uterus exists or (*Dipylidium*, various spp.) at any rate a cavity which—full of eggs—is ultimately broken up into single compartments. On the other hand, there is a much greater likeness to *Eugonodœum* in a genus which I have lately described as new under the name of *Diplopylidium*†. Here we have, as it would appear, no trace of a uterus; but the eggs are found scattered widely through the medullary parenchyma enclosed in a cavity singly; the cavity grows in correspondence with the growth of the contained

* *Cf.* description of ovary and vitelline gland above.

† P. Z. S. 1913, p. 565, text-fig. 93, p. 566, text-fig. 94.

embryo. There is no great difference in size between the egg-holding cavities in the two genera. But there is an important difference in the structure of the wall of these cavities in *Diplopylidium*, and in the presently described genus *Eugonodœum*. In *Diplopylidium* I was unable to find any nuclei lining the cavities, which are simple excavations in the medullary tissue. This was

Text-fig. 148.



Another part of the same section of *Eugonodœum œdicnemi* showing older embryos surrounded by a greater egg-holding cavity in the medullary parenchyma.

A, *B*. Egg surrounded by thick shell and lying in cavity from which nutritive cells (?), such as are shown at *e s*. in text-figure 147, have disappeared. *C*. Older embryo with larger space surrounding it. *D*. A degenerating (?) egg-holding cavity and embryo.

the case, not only with the fully mature embryos, but also in comparatively newly formed cavities. In *Eugonodœum*, on the other hand, the egg-holding spaces possess a lining of cells. It is true that in fully mature embryo-containing cavities these cells are

often, perhaps generally, indistinguishable. But a granular detritus often visible seems to me to indicate that their tendency to disappear is due to the fact that they serve as nutriment for the growing ovum. It may be noted, furthermore, that the egg-shell in *Eugonodœum* is not nearly so broad as in *Diplopylidium*.

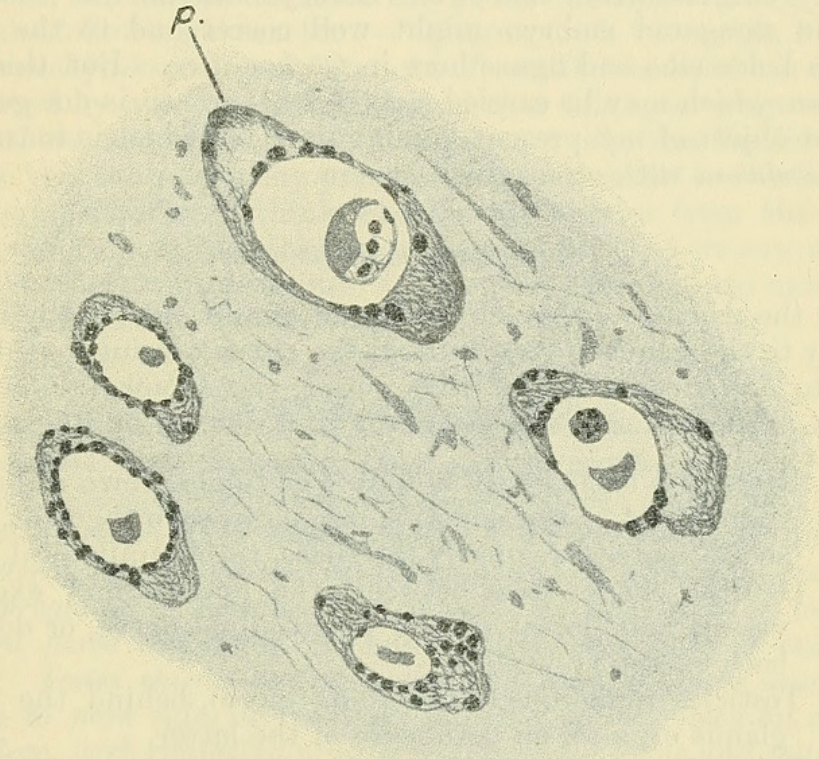
A resemblance exists between the disposition of the ripe ova in the present genus and that which characterizes *Oochoristica*. I have re-examined examples of a species of *Oochoristica* which I described lately to the Society as a near ally of, if not identical with, *Oochoristica wageneri* of Janicki*. In the course of my account of that species I figured the scattered condition of the ripe eggs†, well known from the investigations of others to be one of the characters of this genus. I did not, however, attempt any details, merely showing the inclusion of the ripe embryos each in a separate chamber, and these scattered through the general medullary parenchyma. I have now some details to add to that account. The accompanying figure (text-fig. 149) shows a part of a section through one of the last two proglottids of a specimen of this species. It will be seen that the eggs are more closely packed than in *Eugonodœum*. They are not, however, in contact or enclosed in one cavity. This much concerning the egg-sacs of *Oochoristica* is well known from the observations of several writers previously to myself, *e. g.* Zschokke and v. Janicki. But neither Zschokke‡ nor v. Janicki§ give any detailed figures in their memoirs dealing with *Oochoristica* of the structure of the scattered eggs or oncospheres, or of the spaces which they occupy in the parenchyma. Zschokke describes the three membranes which surround the hexacanth embryos, and observes of them (the embryos) that they "liegen je einzeln in dichtgedrängten, rundlichen, kapselartigen Follikeln des Parenchyms." Cohn‖ figures the crowded embryos with their three surrounding membranes entirely filling the proglottids at the end of the body; but he also does not enter into various histological points which are, as I think, of interest in comparing the scattered egg-capsules of *Oochoristica* with those of other tapeworms.

In longitudinal sections of the entire ripe proglottid these egg-capsules are seen to be circular or more oval in contour, and to be larger or smaller in size with no regularity of arrangement. The differences of size correspond as I think partly at least to differences of age. The more or less circular contour may have a relation to the plane of the sections. Contrary to the observations of Zschokke and Cohn upon the species studied by themselves, I can see but one egg-membrane which occupies all the available space in the egg-follicle. V. Janicki gives no

* Zeitschr. wiss. Zool. lxxxi. 1906, p. 533.
† P. Z. S. 1911, p. 633, text-fig. 150.
‡ "Das Genus *Oochoristica* Lühe," Zeitschr. wiss. Zool. lxxxiii. 1905, p. 53.
§ *Loc. cit.*
‖ Arch. f. Naturg. 1903.

description of the eggs of *Oochoristica wageneri*, which is nearest to, if not identical with, my species, except to state that they are provided with a shell. The sharply defined edge of the shell differentiates the ovum or the cells of the embryo, if it has developed so far, which lie within it from a layer of cells which forms a follicle, and is so far like that which has just been described in *Eugonodœum*. There are, however, differences to be noted which will be apparent from the two figures (text-figs. 148, 149) which illustrate the two species, and which are drawn practically to the same scale. The cells of the egg-follicle in *Oochoristica* have

Text-fig. 149.



A section through a portion of the medullary parenchyma of *Oochoristica*, showing five eggs or developing embryos. *p*. One pole of the usually elliptical embryo-sac.

nuclei of a different appearance and form a thicker layer in that the nuclei are more abundant and closer together. Furthermore, this cellular layer is just as well developed in the largest as in the smallest follicle. The cells do not disappear during the growth of the contained embryo, as would appear to be the case with *Eugonodœum*. It is easy to believe, therefore, in accordance with the opinion of the authors quoted above, that the egg-sacs in *Oochoristica* are portions of a subdivided uterus. I have, however, myself no facts to offer in confirmation of this view.

In many of the egg-follicles the form of the entire follicle is, as already stated, oval. In these cases, which are illustrated in text-fig. 149, the layer of cells extends at the two poles of the ellipse for a considerable distance outwards, and thus a heap of cells is formed. These masses of cells generally enclose a distinct cavity, the function of which arrangement may be to protect the egg from the effect of pressure due to contortions of the worm's body. In any case we have here a state of affairs very unlike that of *Eugonodœum*. It appears to me to be very possible to make a comparison between the egg-sacs of *Oochoristica* and the corresponding structures in two species of *Davainea* studied by v. Janicki*. Referring, for example, to fig. 9 of his memoir, the space lying between the two "Embryonalhülle" at the poles of the elongated embryo might well correspond to the cavity which I describe and figure here in *Oochoristica*. But this comparison, which may be carried a good deal further, is not germane to the object of my present communication, which is to compare *Eugonodœum* with other allied genera.

§ *General Observations.*

On the whole the characters of the present species ally it most nearly to the genus *Monopylidium*, the alliance being very largely due to one species only of that genus, viz. *Monopylidium rostellatum*. The genus *Monopylidium* is thus defined by Ransom†:—

(1) Rostellum armed with a double or single crown of hooks.
(2) A single set of reproductive organs in each segment.
(3) Genital pores irregularly alternate, rarely unilateral.
(4) Genital canals pass between the longitudinal excretory vessels and dorsal of the longitudinal nerve, or dorsal of both excretory vessels.
(5) Testicles numerous (20 to 40 or more), behind the female glands or, also, on both sides of the latter.
(6) Vas deferens coiled, seminal vesicle absent.
(7) Uterus breaks down into egg-capsules, each containing one or several eggs.

The worm which forms the subject of the present paper differs from *Monopylidium* in Nos. (1) and (7), and agrees with the genus in the other characters set forth. These differences appear to be quite enough for generic separation were it not for the structure of *Monopylidium rostellatum*. This species has no rostellar hooks, and of the uterus or rather the disposition of the ripe eggs Prof. Fuhrmann writes‡: "Les oncosphères se trouvent réparties dans tout le parenchyme: chacune d'elles est entourée

* "Ueber zwei neue Arten des Genus *Davainea*," Arch. de Parasitologie, vi. 1902, p. 257.
† Bull. U.S. Nat. Mus. No. 69, 1909, p. 76.
‡ "Nouveaux taenias d'Oiseaux," Rev. Suisse Zool. xvi. 1908, p. 65.

par un parenchyme vacuolaire, qui forme autour de l'oncosphère des cellules hexagonales d'un diamètre d'environ 0^{m}. 17. Les proglottis mûrs ressemblent ainsi beaucoup à ceux de certains *Davainea* à capsules utérines ne contenant qu'un œuf." The difficulty in comparing my genus with this particular *Monopylidium* is that Fuhrmann says very little of a pre-existing uterus.

He merely observes that quite early in the body "l'utérus commence déja à se former," and that further back "les segments sont remplis d'œufs." I am disposed, however, to think that this implies a likeness to the more typical species—such as, for example, *M. unicoronata*, which Fuhrmann describes immediately after dealing with *M. rostellatum*. Moreover, in his résumé of Avian Cestodes, Furhmann* defines the genus *Monopylidium* by, *inter alia*, the following character :—"Uterus stark verzweigt, löst sich in Parenchymkapseln auf,"etc. As *M. rostellatum* had been already described by him it is to be inferred that this species agrees with the others, and is, therefore, so far not like the Tæniid which forms the subject of my present communication to the Society. We may, therefore, I think, exclude my species from the genus *Monopylidium*. Nor does it appear to me that we can refer it to any other known species. I propose, therefore, to name and characterize a new genus as follows :—

Eugonodæum, gen. nov.

Rostellum very muscular, long and retractile, without hooks. Suckers unarmed. Ripe proglottids never much longer than broad. Dorsal excretory tube much smaller than ventral, lying more or less laterally to it; ventral vessels connected by transverse vessels in each proglottid. Longitudinal muscles in two rows of bundles. Genital pores unilateral. Genital ducts pass between excretory tubes. Testes chiefly behind ovary, and then not very numerous. Ovary to pore side, in front of vitelline gland. Genital atrium very deep, with radiating muscles. Cirrus-sac large and muscular, lying in front of vagina. Sperm-duct with coil. Cirrus unarmed. Receptaculum seminis present, but not strongly marked. Uterus not present. Ova imbedded singly in parenchyma accompanied by other cells; round each ovum a cavity is formed later which is lined by cells.

I name as the type *Eugonodœum œdicnémi*, sp. n., with the characters of the genus.

* "Die Cestoden der Vögel," Zool. Jahrb. Suppl.-Bd. x. 1908, p. 65.