

in number to the external orifices i. e. a single funnel to each gland. In two instances I counted four or five funnels among the coils of the tubules and there may be more; the »mucous gland« of *Urochaeta* therefore consists of a tube opening on to the exterior by a single orifice, and branching distally into a number of tubules each of which opens into the coelom by a ciliated funnel. I particularly endeavoured to ascertain if the ciliated funnels were arranged in any regular — metameric — fashion; in the region of the body occupied by the gland the septa are delicate and in places hardly distinguishable; the limits of the segments can however be partially made out by the help of the ventral nerve cord. But even with this assistance I cannot find evidence of any regularity in the disposition of the ciliated funnels, they are principally, if not entirely, confined to the ventral region of the gland and are usually placed on the periphery of the glandular mass; but in some cases there are ciliated funnels in the midst of the glandular mass entirely, surrounded by tubules. The ciliated funnels seem to be confined to the posterior region of the gland; it is I think fairly certain that the ciliated funnels are disposed irregularly and not metamerically.

At present I am unable to say whether there is, or is not, any connection between the »mucous glands« and the nephridia of the few following segments, which have a rather different appearance from the nephridia of the body generally. There is however a certain resemblance between the »mucous gland« of *Urochaeta* and the »head kidney« of the larval *Polygordius*, as described by Hatschek, and of certain Polychaet larvae<sup>4</sup>, which will be obvious from the foregoing description. The only difference, in fact, of importance is the presence of ciliated funnels in *Urochaeta*; in the larval Annelids the tubes open by »flame cells« or else end blindly. The bearing of these facts upon the morphology of the excretory system in Annelids will be more fully discussed in an illustrated account of the anatomy of *Urochaeta* which I hope shortly to publish.

London, Dec. 28<sup>th</sup> 1887.

### 3. Preliminary Notes on the Anatomy of Perichaeta.

By F. E. Beddard, London.

eingeg. 31. December 1887.

(1) Salivary glands. Perrier was the first to describe these organs in *P. Houletti*<sup>1</sup>. Besides nephridial tufts, which Perrier af-

<sup>4</sup> Ed. Meyer, Quoted by Lang, Die Polycladen. Naples Monographs.

<sup>1</sup> Nouv. Arch. d. Mus. t. VIII. (1872. p. 100. pl. II. figs. 38h, 44.)

terwards recognized to be nephridia and not salivary glands opening into the oesophagus, the sixth and seventh segments contain two series of glands: 1) two glands composed of numerous spherical acini the ductules of which unite and open into the oesophagus close to the septum which separates segments 6 and 7. 2) Two pyriform glands in the 6<sup>th</sup> segment opening into the oesophagus at the same point as the last. My own investigations into the anatomy of this species lead me to differ in certain particulars from M. Perrier. The »glandes en grappes« are formed as Perrier states by numerous acini connected with a branching system of ductules which unite to form a thin walled duct of considerable calibre. The acini are composed of very small nucleated cells, and frequently appeared to be solid; in others however a lumen could be observed.

The acini are abundantly supplied with bloodvessels. I find that there are three pairs of groups of these acini occupying, respectively segments 5, 6 and 7. These salivary glands thus exhibit a metameric arrangement. The »pyriform glands« of Perrier seem to me to be the collecting tube which receives the ductules from the several groups of acini, and, passing forwards, opens into the hinder region of the pharynx.

In another species of *Perichaeta* — *P. aspergillum* — the same glands are present.

These salivary glands are, in my opinion, to be regarded as the homologues of the septal glands of the Enchytraeidae and Lumbriculidae. In *Anachaeta* (Enchytraeidae) and in *Phreatothrix* (Lumbriculidae) there are, according to the figures and descriptions of Vejdovsky<sup>2</sup>, three or four pairs of these glands connected by a common longitudinal duct on each side, which opens into the pharynx. In their metameric arrangement, and in the common longitudinal duct they agree with *Perichaeta*; the only difference is that there is but a single acinus on each side in each segment in these lower *Oligochaeta*, while in *Perichaeta* the acini are numerous. There is thus a close correspondence between *Perichaeta* and certain »*Limicolae*« in the structure of the salivary glands; this fact lends additional support to the contention that it is impossible to divide the *Oligochaeta* into two groups »*Limicolae*« and »*Terricolae*«.

(2) Capsulogenous glands. In three species of *Perichaeta*, viz. *P. Houletti*, *P. aspergillum* and *P. mirabilis* there are a number of small glands which may possibly represent the capsulogenous glands

<sup>2</sup> System und Morphologie der Oligochaeten. Pl. VII. Fig. 1. Pl. XI. Fig. 17.

of *Lumbricus*; like them these glands occur in the genital segments; the absence of any histological description of the capsulogenous glands in *Lumbricus* prevents me from identifying the two series of glands with any certainty. These glands have already been noticed by Perrier in *P. aspergillum* and *P. affinis*; in the former species they are a series of minute white glands opening by a number of orifices round the apertures of the vasa deferentia and those of the spermathecae; in the latter they open on to the genital papillae of the 17<sup>th</sup> and 19<sup>th</sup> segments.

In *P. mirabilis* the orifices of these glands are very conspicuous and are five in number; three on one segment, one median and two lateral; a single median pore on the following segment. I am not certain whether the species referred to here is really Bourne's *P. mirabilis* but in any case it comes near to it. In *P. aspergillum* I find exactly the same disposition of the orifices of the glands round the male pores that Perrier has described, but not round the pores of the spermathecae. There are a pair of orifices on each of segments, they lie a little to the outside of the spermathecal pores, for which they might well be mistaken, as the latter are often invisible. This difference may however be of specific value. In both species the glands have the same structure; they consist of groups of unicellular glands; the cells are loaded with granules and each communicates with the exterior by means of its own duct which is simply a prolongation of the cell; in the case of *P. aspergillum* each group of gland cells is separate and opens on to the exterior by a separate pore; in *P. mirabilis* the groups of gland cells are partially fused with neighbouring ones; the duct of each group, which as in *P. aspergillum* consists of the prolongations of the several cells bound up in a common sheath, traverses the integument independently, but the external apertures are common to a considerable number of ducts.

In *P. Houletti* Perrier has stated that the spermathecae (of which there are 3 pairs) are each furnished with two diverticula; one is a tube bent upon itself several times, the other a pearshaped body. I find this to be the case in some specimens; in others there were often two pearshaped bodies attached to a single spermatheca. The structure of these is not the same as that of the coiled diverticulum; the latter has a lumen which is lined with a cubical epithelium; the pearshaped diverticula consist of a solid mass of granular cells and in fact agree in every particular of structure with the «capsulogenous» glands of *P. mirabilis* and *P. aspergillum*. They only differ in that their ducts open into the terminal region of the spermatheca. The differences in the number and position of the «capsulogenous» glands

in these four species of *Perichaeta* appear to indicate that they will furnish a means of discriminating the species of this genus. Perrier has already expressed the opinion that the genital papillae furnish useful specific characters; and I am inclined to believe that the so-called genital papillae (in *Perichaeta*) are always the orifices of »capsulogenous« glands. Since however these glands in *P. Houletti* are not recognizable externally — and there may be other similar instances — I would rather lay stress upon the number and distribution of the glands themselves. A means of distinguishing many species of *Perichaeta* is even now (in our presumably limited acquaintance with the genus) a desideratum.

London, Dec. 22<sup>nd</sup> 1887.

#### 4. An Interesting specimen of *Taenia saginata*.

By Frederick Tuckerman, M. D., Amherst, Mass.

cingeg. 3. Januar 1888.

I am indebted to Dr. John G. Stanton, of New London, Conn., for kindly sending me this interesting entozoon.

The specimen is chiefly remarkable for its unusual length and the malformations which it presents. It consists of one long unbroken chain, four shorter ones, and a few detached portions, the latter containing from one to three segments. All of these disjointed parts were expelled by their host (with the aid of a powerful anthelmintic) at a single evacuation of the bowels. The head, neck, and cervical joints unfortunately were not found. The long ribbon or chain measures 6.516 metres in length and contains 653 joints. The aggregate length of the shorter ribbons and smaller pieces is 0.939 metres and is composed of 58 joints. From a careful measurement of the cephalic extremity in other *Taeniae* of this species I estimate the number of missing joints of this region in this specimen at 350. Adding this number of joints to those already enumerated will give a total of 1061 joints in a chain about 7.655 metres long.

Leuckart, the distinguished helminthologist, in his diagnosis of *Taenia saginata* gives the length of this species of tape-worm, when extended, as 7 or 8 metres. But at the bottom of p. 427 in the English edition of his classic treatise on »Die menschlichen Parasiten und die von ihnen herrührenden Krankheiten« is the following note:

»According to Bremser and Diesing, the famous Viennese collection of Helminths contains chains 20 to 24 feet long, very much longer, therefore, than the preserved specimens I have measured, which were at most only slightly above 14 feet.«

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