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Schneider's pore and the oesophageal glands of nematodes

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support of the cutting cuticle. So soon as a wound is made by the jaw, it is impregnated by the secretion which streams out between the teeth, whereby in the vessels which are bitten into not only the coagulation of the blood, but also the conglutination of the vascular membranes (Blutplättchen) is prevented—at least in the case of *Hirudo medicinalis*.

I have not succeeded in demonstrating an anti-coagulating effect in the case of the extract from heads of *Aulastomum* hardened in alcohol. I have been able to convince myself that *Aulastomum* is able to inflict a skin-wound upon frogs and to suck blood; subsequent bleeding from the wound, however, I have not found. So far as I have seen, *Aulastomum* wounds the skin of only such frogs as are badly nourished and do not defend themselves vigorously, and then only on the toes of the posterior extremities. In the case of dead frogs, *Aulastomum* also fixes itself and sucks in the oral cavity, the pharynx, and deep in the throat.

I hope shortly to be able to publish a more detailed account of my results.—*Zoologischer Anzeiger*, xvi. Jahrg., no. 433, November 13, 1893, pp. 427–429.

Utrecht, October 1893.

Schneider's Pore and the Œsophageal Glands of Nematodes.

By Prof. OTTO HAMANN, of Göttingen.

Since the investigations of Schneider the Œsophagus and its glands in parasitic Nematodes have not been subjected to a renewed and more minute examination, and the subject was left with the brief allusion to a capilliform canal, which this investigator had observed in the Œsophagus of *Ascaris megalocephala*. In his 'Monographie der Nematoden' (pp. 191 & 192) in dealing with this species Schneider alludes to a canal, which is stated to open on the dorsal side of the internal Œsophageal wall and which could be traced for a short distance. Whether this canal extends deeper into the substance of the Œsophagus is a question which he leaves undecided. Up to the present I have discovered the pore with its canal in a large number of Adriatic Ascaridæ and Strongylidæ, and in *Lecanoccephalus*. I propose to give a short description of it as found in the latter form. Schneider's pore is situated a short distance below the lips on the dorsal side of the internal wall of the Œsophagus, and constitutes a communication between the Œsophageal lumen and an organ which lies in the Œsophageal wall. The pore leads into a capilliform, membranous, hyaline canal, which at first runs at right angles, and then bends round and passes backwards parallel to the longitudinal axis of the Œsophagus. The canal is surrounded by a granular substance, which offers a marked contrast to the basal substance of the Œsophagus. It never lies free, but even at its hinder end, where it has become more and more slender, the canal is enclosed in this substance. It can be followed throughout the entire length of the Œsophagus almost as far as the sphincter appa-

ratus, which is present in all Nematodes and divides the œsophagus from the mesenteron. At the end of this organ stellate cells are found, which probably have an excretory function.

In *Ascaridæ* and *Lecanocephalus* a cæcum is described, which is said to project backwards at the point where the œsophagus passes into the mesenteron, while a diverticulum of the intestine extends forwards. As is shown by transverse sections, the structure in question is not a cæcum, but a solid organ, which represents a projection of the œsophageal wall on the ventral side. A cavity opening into the lumen of the œsophagus is not found in its centre. With reference to the complicated structure of this organ, I will here only make the following observations. This gland, for such it undoubtedly is, is composed of cells, which are traversed by a capilliform intracellular tubule. In transverse sections the gland exhibits a biscuit-shaped figure, and is divided into two halves by a central septum. In each half lie the perforated cells already mentioned, so that consequently two delicate tubules are present. Now it is possible to follow these canals and observe how they enter the œsophageal wall, from which, as I remarked, the gland is a projection, and open each by a pore into the lumen of the œsophagus a little distance above the point where the gland fuses with the œsophageal wall. The excretory organ of the lateral lines, as I have already described it in *Lecanocephalus* in a previous communication, is essentially constructed in precisely the same manner as this œsophageal gland, since it is composed of a number of perforated cells. In both cases the canal is intracellular in position.

If we take the position of the œsophageal gland into consideration, and reflect that it is situated near the commencement of the mesenteron, and is suspended in the cœlome, we shall find no difficulty in assuming that this organ absorbs excretory products from the cœlomic fluid.

In the parasitic Nematodes, moreover, organs are found lying in the cœlome, which are in connexion with the lateral lines. *Lecanocephalus* possesses several peculiar organs measuring 4 mm. in diameter, which are distinguished by their digitate ramifications and enclose in their centre a disproportionately large nucleus. The digitate processes bear small pyriform structures, which attract attention on account of their strongly refractile granular substance and give rise to the conjecture that they may be homologous with the ciliate organs. A ciliation, however, I have so far never succeeded in discovering. These organs, which are in connexion with the lateral ridges by one end, are undoubtedly identical with the "fasciculate bodies" ("buschelförmigen Körpern") alluded to by Leuckart, Schneider, and others, in the case of *Ascaris megalocephala*, and situate in the neighbourhood of the excretory pore. The detailed description of these organs, as well as of those previously referred to, will be given in a monograph of the genus *Lecanocephalus* and allied forms which will shortly appear.—*Zoologischer Anzeiger*, xvi. Jahrg., no. 433, November 13, 1893, pp. 432-434.