

A MESOSTOMA FROM BLOEMFONTEIN  
(*M. KARROENSE*, n. sp.).

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About a dozen specimens were collected in a small temporary pond on clay soil on the hill behind the Grey University College. The pond is always contaminated with cattle droppings.

As long as the pond contains water it is regularly visited every week, but although this has been done for the last two years, the worms have only been found once—in May, 1914. They were all more or less congregated together in one part of the pond, and were all actively producing spermatozoa; a few had no eggs in the uteri, but most had from one to four reddish-brown "winter-eggs" in each uterus.

The worms measured (preserved in  $\text{HgCl}_2$ ): Length up to 10 mm.: breadth 4.5 mm. A typical specimen n-as 9.5 long by 4 broad, with the genital aperture 4.5 from the anterior end (6, Fig. 1) and 5 from the posterior end; with the mouth (5) 2 mm. anterior to the genital aperture.

The outline of the preserved specimen is shown in Fig. 1; the anterior end is squarish on account of the sucker (4 in A—A, Fig. 1) being retracted. On the dorsal surface in the anterior region there are two sharply defined ridges (1, Fig. 1). Laterally the body is expanded into two flaps which tend to curl upwards, especially in the posterior region.

The pharynx is of the type called *rosulatus*; the excretory system resembles closely that of *M. ehrenbergii*, except that the "oral" cup is not well defined; there are two eyes with black pigment which, in sections, is seen to be prolonged into the mesenchym as fine strands; the colour is dirty yellowish white with the region of the gut dirty brown owing to the secretions of the vitellaria and of the endoderm cells; the ectoderm is densely packed with rhabdites; the cerebral ganglion is produced backwards into a pair of ventral and a pair of lateral nerve chords: there is no otocyst.

The reproductive system, which is of prime importance for the classification, is described in greater detail.

The testes lie in the lateral flaps (3, Fig. 1), thus laterally to the vitellaria. In whole mounts it can easily be observed that each testis is divided into a pre-pilaryngeal and a post-pharyngeal portion, thus resembling *Mesostoma lingua*; but a reconstruction of serial sections shows that each of these two testicular portions is again subdivided irregularly; Fig. 2 shows the pre-pilaryngeal portion of the left testis with the vaso efferentia marked *x*. The vasa efferentia of each side join a longitudinal vas deferens, which, near the opening of the vitelline ducts

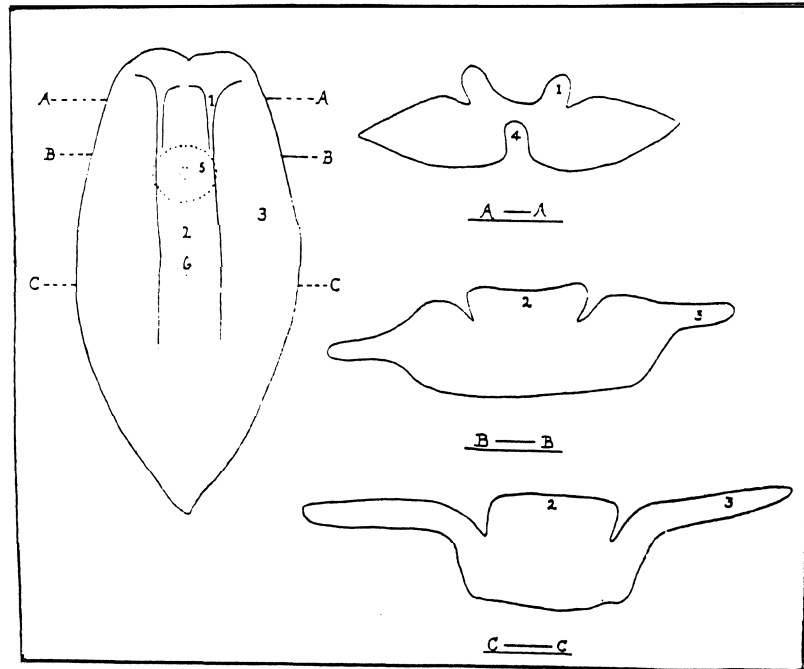


FIG. 1.—Outline of body seen from dorsal surface with three sections through AA, BB, and CC. 1 = dorsal ridge; 2 = median portion of body, around gut; 3 = lateral flaps; 4 = sucker; 5 = pharynx and mouth; 6 = genital aperture.

(12, Fig. 3), is connected to a vessel running forwards and meeting a similar vessel just before opening into the vesicula seminalis; there is therefore no seminal duct, the two vasa deferentia only combining just as they enter the vesicula. The vesicula opens into the "granular" vesicle (3, Fig. 3), which contains the "granular" glands in it, the lumen for the passage of the seminal fluid being restricted to a narrow tube on the inner side. In the figure the penis is shown retracted within its sheath, so that

the cuticular valve-like point (6) of the penis seems to lie within the penis; 5 is the cavity of the penis sheath.

The single ovary (7) lies on the side just above the end of the uterus; the oviduct has two muscular portions (8 and 9), to which I shall return later, and an enormous receptaculum seminis (10) filled with spermatozoa. The hinder portion of the receptaculum is embedded in the ventral part of the post-pharyngeal gut. The vitellaria lie dorsal to the whole of the gut and are in the form of two sets of anastomosing tubes; from each of these a number of minute ducts open into the two lateral vitelline ducts which

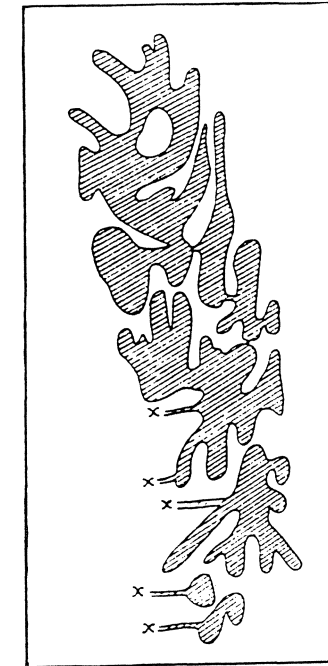


FIG. 2.—Reconstruction of the pre-pharyngeal portion of the left testis. *x* = vasa efferentia.

lie close to the lateral vasa deferentia, and which open into the oviduct at 12, Fig. 3. The common duct (14) receives accessory female ducts (13), these lie in two groups ventral to the ductus communis and open by a pair of ducts, but some of the oligo-cellular glands also open independently into the ductus communis. Further forwards the duct enlarges to form a vagina (15), which has a thick sheath of circular muscles and thinner outer sheath of longitudinal fibres; the vagina in both the specimens cut serially contains a ball of spermatozoa. There are two uteri (22) which

open posteriorly into the atrium (18); the uterine ducts are glandular and the secretion is poured into the uteri. In one of the two cut specimens there is a distinct dorsal outgrowth (19) from the atrium; it is in the position of the bursa copulatrix of other species, but in the present species it is lined by the same tall glandular cells which line the rest of the

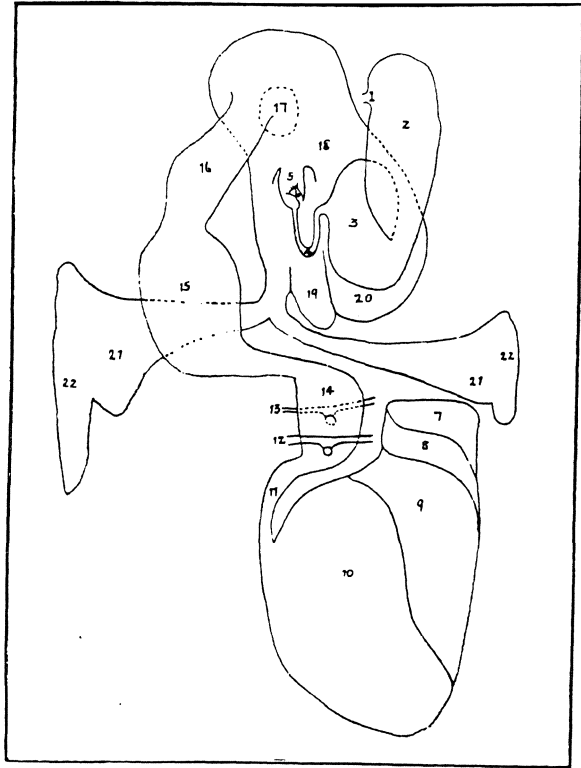


FIG. 3.—Reconstruction of the genitalia. 1=opening of the two vasa deferentia; 2=vesicula; 3="granular" vesicle; 4=ductus ejaculatorius; 5=cavity of penis-sheath; 6=chitinous end of penis; 7=ovarium; 8 and 9=muscular part of oviduct; 10=receptaculum; 11=oviduct; 12=vitelline ducts; 13=illicessory female glands; 14=ductus communis; 15=vagina; 17=common genital aperture; 18=atrium; 19=vestigeal bursa (?); 20=atrium, in which lies the base of the penis; 21=uterine glands; 22=uteri.

atrium, and it moreover has no muscle fibres surrounding it; also there is a vagina; so the outgrowth (19) is clearly not a functional bursa, although it may possibly represent a vestigeal bursa.

In the above there are several points worth noting.

Firstly, although the whole organization of the animal indicates a close

relationship with *Mesostoma lingua*, it possesses a vagina, the absence of which is one of the diagnostic features of the family Typhloplanidae, and in connection with the presence of a vagina goes the absence of the bursa, which is typically present in the genus *Mesostoma*. The points of resemblance between the present animal and other *M.* spp. are, however, so numerous that it would be folly to establish a new family to receive it; the only correct course is to drop "vagina absent" from the diagnostic characters of the Typhloplanidae in future.

Secondly, although the structure (7) is that of a typical ovarium, and has the position of that organ as it is in other *M.* spp. (e.g. *M. productum*), I have failed to find the oviducal lumen through the muscular portions (8 and 9). The portions marked 8 and 9 are round tubes with muscle fibres, arranged from right to left, completely blocking their lumina. Also, the secretion of the uterine glands (21) is suspiciously like that found in the eggs, so that I am half inclined to believe that, although the "vitellaria" described above have the histological structure of such organs as described for other *Planaria* (Schneider, "Lehrbuch der Histologie"), they may be germaria, perhaps even ovaria; the body (7) would then be a gland of unknown function. Anyway, the reproductive organs of *Rhabdocoelida*, as also of the present species, need "intra-vitam" study before we can be clear as to the part which the numerous kinds of glands play in reproduction.

In conclusion, I may mention that two other Typhloplanidae have been recorded from Africa (according to von Graff in "Das Tierreich": Turbellaria II. Rhabdocoelida, 1913).—

1. P. 461, *Mesopharynx otophora* (Schmarda), from Stellenbosch.

9. P. 292, *Mesostoma lacteum* (Neppi), from fresh water near Gara Mulata, Ost Afrika.