

von den Böden der epigynealen Furchen, wo sich die Receptacula und Bläschen anschließen, erweitern und drehen sich etwas spiralg. Die Receptacula und Bläschen werden dadurch aus ihrer ursprünglichen Lage verschoben und erhalten einen gedrehten Ausgang: Typus der *Tarentula aculeata* Cl. (Fig. 14), die dazu noch eine große vordere Quertasche besitzt. Durch den zuletzt beschriebenen Entwicklungsgang lassen sich auch die Vaginalsysteme der *Tarentula nemoralis* Westr., *Trochosa terricola* Thor, *Tr. ruricola* DG., *Pirata piraticus* Cl. erklären; ihre Receptacula sind nämlich mit homologen Basalteilen versehen. Die Verschiedenheiten kommen im Laufe der vordersten (jüngsten) Teile der epigynealen Furchen, im Vorhandensein und in der Art der Quertaschen, vor.

Es läßt sich also, nach meiner Deutung, eine Reihe von verschiedenartigen Vaginalsystemen der Lycosiden von einem Urtypus, wenn auch durch einige hypothetische Zwischenformen, ableiten. Diese Möglichkeit und die einfache Erklärung der Genesis der Epigynebildungen, die meine Deutung gibt, hat mich veranlaßt, sie, sowie auch die Beispiele, zu veröffentlichen, und zwar in einer Abhandlung: »Zur Morphologie der Vaginalorgane der Lycosiden« in der Festschrift für Palmén, Helsingfors, 1905 7, Nr. 6. Es schien mir aber wünschenswert, nicht nur die erlangten Resultate in kurzer Übersicht hier mitzuteilen, sondern auch durch schematische Bilder und einige hypothetische Stadien zu ergänzen.

5. *Weldonia paraguayensis*.

A doubtful form from the fresh water of Paraguay.

By C. H. Martin, University of Glasgow.

(With 5 figures.)

eingeg. 30. Januar 1908.

In this paper I wish to describe shortly a new form, the systematic position of which I am quite unable to determine from the fresh water of Paraguay.

In October of 1907 Dr. Bles knowing that I had been working on nematocysts in Turbellaria handed me a tube which he said contained four *Microstoma* from Paraguay.

I should like to take this opportunity of thanking Dr. Bles for the material, and Professor Graham Kerr for much kind help and for allowing me to work the material through in the laboratory at Glasgow University.

In their naked eye appearance these animals closely resembled *Microstoma lineare*, as they are of much the same size and possess a similar power of budding new individuals from their posterior end.

But a more careful examination showed not only that they were not *Microstoma*, but that they could not be satisfactorily placed in any accepted group of Turbellaria. Each specimen consisted of two well developed Zooids, measuring in one case 1,2 mm in length, and, 9 mm in the other; These individuals of the second order already showed signs of further division since the sense organs of the third generation could already be detected.

At the anterior end there is a large mouth opening into a pharynx, of which the thin walls are thrown into a series of complicated folds, especially on the neural side.

This folding is evidently connected with the great distensibility of the pharynx, since two large Lyncaeiids were found in the intestine of one form.

Fig. 1.

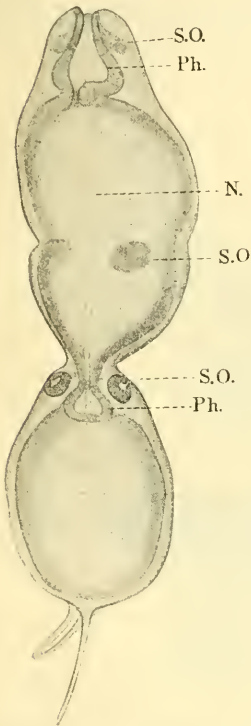


Fig. 2.

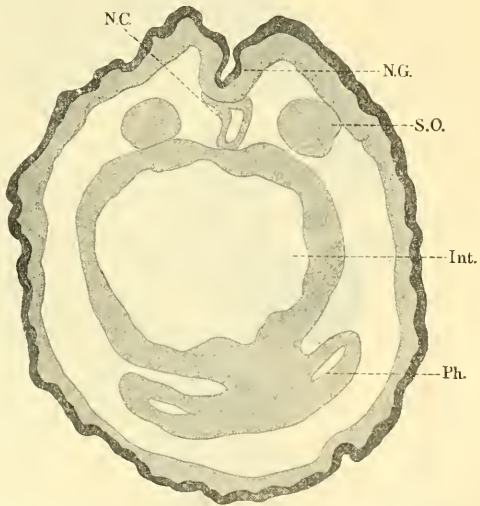


Fig. 1. An apo-neural view of a budding stock of *Weldonia paraguayensis*. The neural groove and sense organs are seen by focussing down. 16 mm. $\times 6$. Comp. Oc.
 Fig. 2. Section through anterior end of individual of the third order. Showing the nervous system ending as a tube on the opposite side to the junction of the pharynx with the intestine. 4 mm. Apochromat. $\times 4$. Comp. Oc.

The pharynx passes into a large simple intestine, and there is no trace of an anus.

The most interesting feature of the creature is however furnished by a deep groove which passes down the whole length of the animal terminating at the end of a short tail.

The side along which this groove runs I shall term neural, and the opposite side apo-neural, as the question as to which is the true dorsal side of the animal must unfortunately remain open.

On the apo-neural side of the posterior end there is a much larger and more slender tail.

In transverse sections the gut and nerve cord run along the whole length of the animal with the exception of a short break indicating the future line of separation between the two individuals of the second order.

The nerve cord during the greater part of its length consists of a much flattened tube.

At the anterior end of each individual the nerve cord turns upwards and comes into contact with the wall of the neural groove (fig. 2).



Fig. 3. Next section showing tubular nerve cord and sense organs with their ganglion. 2 mm. Apochromat. $\times 4$. Comp. Oc.

Near the anterior end of each individual the nerve cord gives rise by short lateral stalks to two large ganglia which on each side surround a sensory invagination of the epidermis lying on the neural side of the pharynx (fig. 1, 3).

The pharynx of the younger buds is found on the apo-neural side of the animal (fig. 2), as an inpushing of the epidermis, which in later buds comes into communication with the intestine on its apo-neural side.

These stages of the development of the pharynx are very like those

which can be found in transverse sections through a budding *Microstoma* stock.

Unfortunately in the specimens which I possess, there is no trace of sexual organs, and on the analogy of such fresh water forms, which bud, as *Stenostoma* and *Microstoma* amongst Turbellaria, and *Aeolosoma* and *Stylaria* amongst Oligochaets, it would be natural to suppose that the sexual forms only occur for a very short period during the later summer months.

As regards the finer details of the Histology of this form, the preservation of the individuals which I possess is not too satisfactory, particularly as regards the structure of the outermost layer of the body wall.

The body wall consists (fig. 4):

- a. a cuticle.
- b. a syncytial layer.
- c. a thin band of circular muscle fibres.
- d. strands of longitudinal muscle fibres.

The cuticle stains rather readily with Haematoxylen and seems to be composed of a series of parallel rods arranged with their long axes

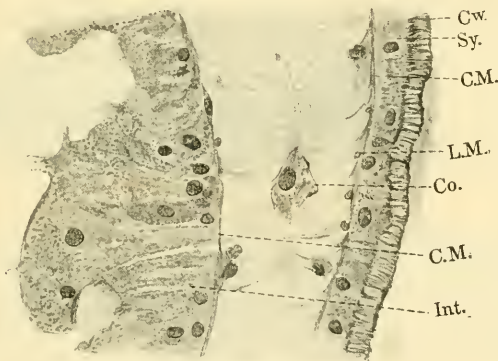


Fig. 4. Section through body wall and gut. 2 mm. $\times 6$. Comp. Oc.

vertical to the periphery. Whether this appearance is the optical expression of the apertures of a large number of mucous glands is still a moot point.

No trace of Cilia can be found and from the presence of an appendage of *Asellus* in the gut of one form, I should feel inclined to hazard the suggestion that the animal creeps about in the mud and devours disintegrating crustacea.

The Syncytial layer contains a large number of more or less vesi-

cular nuclei; it is thin over the greater part of the animal but at the sides of the neural groove it thickens merging into a distinctly columnar epithelium, the peripheral border of which stains strongly with Haematoxylen.

Beneath the Syncytial layer a thin band of circular muscle fibres is found and within these a number of isolated longitudinal fibres.

The body wall in the region between two well developed individuals is thrown into a series of longitudinal folds.

The body cavity contains a large number of amoeboid corpuscles, these in certain regions of the body seem to associate in a loosely reticular tissue.

The wall of the gut is composed of an outer layer of circular muscles and a layer of digestive cells.

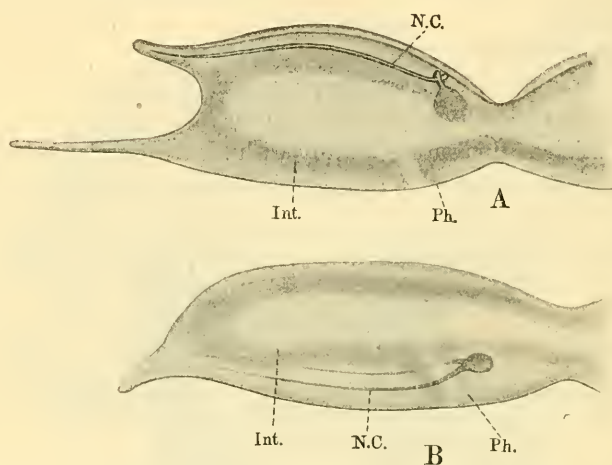


Fig. 5. Diagram of stock of *Weldonia paraguayensis* (A) and *Microstoma lineare* (B) showing relative positions of the pharynx, intestine and nervous system.

C.M., Circular muscles; *L.M.*, Longitudinal Muscles Fibres; *Co.*, Corpuscle in Body Cavity; *Cut.*, Cuticle; *Ep.*, Epidermis; *G.*, Ganglia; *Int.*, Intestine; *M.C.*, Muscle cell; *N.C.*, Nerve Cord; *N.G.*, Neural Groove; *Ph.*, Pharynx; *S.O.*, Sense organs; *Sy.*, Syncytial layer.

These cells seem to possess a certain amount of amoeboid movement at their internal periphery.

The sense organs resemble the "ciliated pits" found in the lower Turbellaria and consist of T shaped invaginations of the Epidermis.

The Internal wall of the sense organ consists of the following layers: —

- 1) a layer of mucus.
- 2) a layer of sensory (?) cells with large lightly staining nuclei.
- 3) Ganglion cells.

It now becomes necessary to attempt some answer to the question as to the true systematic position of this form.

As was said above the external appearance is extraordinarily suggestive of a turbellarian nearly allied to *Microstoma*.

But there are numerous and serious objections to this view, of which it is only necessary to mention two:

- 1) the presence of a cuticle, and the apparent absence of cilia.
- 2) the relations and structure of the nervous system.

v. Graff in his account of the Turbellarian nervous system in Bronns Tierreich (p. 2164) states firstly that »bei allen Rhabdocoe-liden finden sich zwei, meist der Ventralseite genäherte Längsnerven-stämme, die, an Stärke alle andern Nerven übertreffend, im Vorder-körper durch eine Commissur verbunden sind« (with the exception of two parasite forms, *Fecampia* and *Sangainicola*), and secondly (p. 2165) »Stets liegt das Gehirn vor oder über dem Pharynx, und wo ein präoraler Darmschenkel sich über das Gehirn hinaus nach vor erstreckt, da ist letzteres stets unter diesem Darm-schenkel angebracht.«

In this form we have in the posterior individuals a prae-oral gut but instead of cerebral ganglia lying between the Pharynx and the intestine and being connected by circum-oesophagaeal nerve cords with nerve trunks under the gut, the whole nerve cord with its ganglia lies, if one regards the pharynx as ventral, dorsal to the gut. This position, coupled with its tubular structure, seems to me to present a condition bearing a closer analogy to the arrangement which may have occurred in some extremely early Chordate, than to that found in any known Turbellarian.

I should like to name this form *Weldonia paraguayensis* in memory of the late Professor Weldon.

Literature.

v. Graff, Turbellaria. Bronns Tierreich. 1907.

6. Zur systematischen Stellung von *Tetragonopterus longipinnis* Popta.

Von Dr. C. M. L. Popta, Leiden.

eingeg. 31. Januar 1908.

In den Sitzungsberichten der kaiserlichen Akademie der Wissenschaften in Wien, Jahrgang 1907, S. 293 weist Steindachner dem von mir beschriebenen *Tetragonopterus longipinnis* eine Stellung in dem Genus *Brachyhalcinus* an. Da ich dies nicht für richtig halten kann, so möchte ich hier die Gründe angeben, aus welchen dieser Fisch kein

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