

das Keimbläschen hineinschlüpfen. Allerdings hat Lowne diesen Vorgang nicht beobachtet und meint selber, hier sei ein »serious hiatus« in seiner Hypothese.

Als ich Lowne's Arbeit durchgieng, um ein Referat von ihr für den Zool. Jahresbericht anzufertigen, wurde ich — wie es Jedem an meiner Stelle geschehen wäre — über diese Resultate stutzig und sah mir die Abbildungen an, welche Schnitte durch die Kittdrüse wiedergeben. Man erblickt da in den Zellen außer den Kernen Gebilde, welche Lowne mit Bestimmtheit als Keimbläschen anspricht und aus den Kernen hervorgehen lassen möchte; mir jedoch schienen sie sofort ungenaue Reproduktionen der chitinigen Bläschen (samt ihren Höfen) zu sein, welche bei Insecten so vielfach in allerlei Drüsen vorkommen. Eigene Untersuchung an mehreren Arten Fliegen bestätigte diese Vermuthung. Lowne bestreitet zwar die Abstammung der Kittdrüsen vom Ectoderm und redet auch nicht von einer chitinigen Intima; hätte er aber, statt zu seiner abenteuerlichen Hypothese zur Kalilauge gegriffen, so würde ihm der Sachverhalt klar geworden sein. Und hätte er — was freilich auch manche junge Forscher auf dem Gebiete der Insectenkunde zu ihrem eigenen Schaden unterlassen — sich Leydig's ältere Arbeiten angesehen, so würde er in Müller's Archiv für Physiologie, Jahrgang 1859 Taf. 3 Fig. 28 eine gute Abbildung gefunden haben und vor seinem Mißgeschick bewahrt worden sein.

Die Arbeit enthält auch sonst noch bedenkliche Punkte, jedoch will ich hier nicht weiter darauf eingehen. Wohl aber halte ich es für gut, zu betonen, daß die Anwendung von Kalilauge und Essigsäure bei der Untersuchung der Arthropoden gegenwärtig arg vernachlässigt wird. Man möge doch erst dann das Microtom in Bewegung setzen, wenn man mit jenen beiden Reagentien und mit Schere, Nadel und Pincette nichts mehr ausrichtet.

Neapel, Zool. Station, 23. April 1890.

6. „Atrium“ or „Prostate“?

By W. B. Benham, D.Sc. London.

eingeg. 30. April 1890.

In many of the *Oligochaeta* certain portions of the male reproductive apparatus connected, either directly or indirectly, with the spermiducal pore have received the name »atrium«; and other portions, somewhat similar in their relations, have, in other genera, or in the same genera, been called »prostates«.

Mr. F. E. Beddard has recently contributed two papers on the subject, wherein he homologises those structures which are present in many Earthworms and which have been usually regarded as »prostates«, with the »atria« of the Tubificidae and other freshwater *Oligochaeta*. My purpose is to give certain reasons for retaining the word »prostate« for these organs in Earthworms.

1) The general idea of the word »atrium« is a chamber, into which open other smaller chambers, or passages. For instance, we speak of the »atrium« of the piscine heart, which receives the body veins; there is the »atrium« of *Amphioxus*, into which the pharyngeal slits open, and which communicates with the exterior; in the Tunicates, the »atrium« has a similar relation; and so on.

2) Claparède used the word in the same sense as Vejdovský does, to mean the dilated terminal portion of the spermduct, which communicates with the exterior, contains the invaginable penis sheath, and into which the »cement gland« pours its secretion. Vejdovský has shewn that it is formed by invagination of the body wall; is lined by a layer of cells, which are sometimes ciliated: is provided with a muscular coat, which in its turn is surrounded by a layer of granular peritoneal cells (as in *Stylaria*, *Tubifex*, and others).

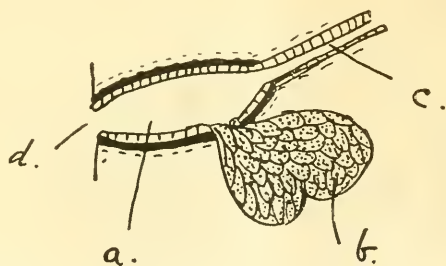


Fig. 1. *Tubifex*: a atrium, b prostate, c spermduct, d pore of atrium¹.

3) What is the condition of things in the Earthworm? In *Acanthodrilus*, *Pontodrilus* and others there are cylindrical, more or less coiled whitish structures in the neighbourhood of the spermiducal pores: these organs are hollow, lined by epithelial cells, which are cubical or columnar, and non-ciliated: and surrounded by a thick coat of pear-shaped cells containing numerous granules: closely resembling clitel-

¹ In each figure, the atrial epithelium is represented as square cells: the prostate or »clitellar« cells as pear-shaped granulated cells: the muscular coat by a thick black line: and coelomic epithelium as a row of dots.

lar cells in fact; no coat of muscle is present except near the external aperture.

In *Trigaster*, *Megascolides*, *Perichaeta* and other genera, the organ is distinctly divisible into two regions: a distal region, having the above structure (more or less complicated in *Perichaeta*), and a proximal region in which the »clitellar« cells are absent, and the epithelium is surrounded by a muscular coat; the spermduct, in the two latter genera communicates with this proximal region.

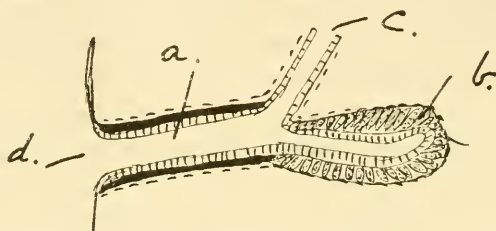


Fig. 2. *Pontodrilus*, *Megascolides* &c.: The spermduct (c) and prostate (b) communicate with the atrium (a) at about the same point: the prostate, which is solid in *Tubifex*, is now hollowed out and the atrial epithelium is continued up into it.

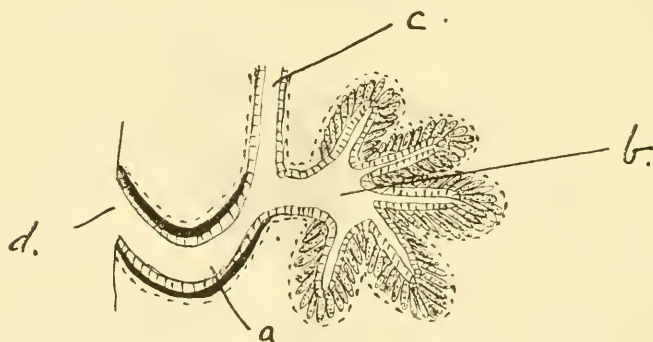


Fig. 3. *Perichaeta*: The atrium is curved and protrusible: the prostate is branched and lobed.

In *Eudrilus* the muscular coat surrounds the whole organ, which presents some points of difficulty in its interpretation.

In *Moniligaster*, the epithelium is surrounded directly by a muscular coat, outside which is a thick layer of pyriform cells, with granular contents; so that this organ in *Moniligaster* very closely resembles the »atrium« in *Stylaria*, *Tubifex* &c.

4) Such are briefly the facts: it is in the interpretation of these facts that I differ from Mr. Beddard. He calls all these organs »atriac«:

I would regard them as »prostates«: although I admit that a portion of the prostate in *Perichaeta*, *Eudrilus*, and other genera, in which the spermduct and the prostate join, is probably the homologue of the »atrium« of *Tubifex*: for it receives the spermduct: it receives the glandular region or prostate proper, and communicates with the exterior, moreover it is provided with a coat of muscles. But in referring to any of these structures as a whole, »prostate« seems to be the more appli-

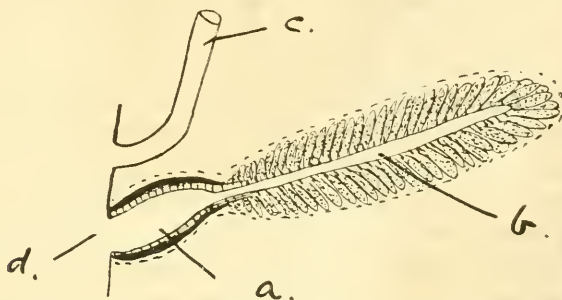


Fig. 4. *Trigaster*, *Acanthodrilus* &c.: The prostate has the same structure as in *Pontodrilus*, but the spermduct does not communicate with the atrium: it opens externally in the next segment.

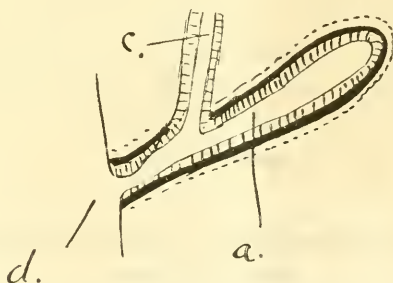


Fig. 5. *Moniligaster*: — the glandular prostate-cells seem to be absent: so that we have only an atrium.

cable term: since by this word is generally understood a glandular structure which secretes a fluid, which is utilised in some way or another — how is not thoroughly known in *Oligochaeta* — in the process of copulation, perhaps for diluting the »sperm-fluid« or for connecting the spermatozoa together, to make a »spermatophore«. But, that these organs have some such function is admitted, and as similar organs having similar functions are called »prostates« elsewhere, it seems better to retain the word in place of the ill-defined term »atrium«.

Beddard takes up rather a curious position in regard to the pro-state of *Moniligaster*. For him, the peritoneal coat, outside the muscular wall of the atrium is the »prostate«, and is homologous with the »Cementdrüse« (or prostate) of *Tubifex*.

Now, this prostate in *Tubifex*, has been shewn by Vejdovský, to be formed by a proliferation and outgrowth of the atrial epithelium at a certain point, which bursts through the muscular wall of the atrium and projects into the body cavity. The atrial epithelium is derived from the epidermis, so that the »Cementdrüse« is epiblastic. Where as the glandular covering of the »atrium« of *Moniligaster*, *Stylaria*, *Rhynchelmis* &c. is mesoblastic — if it is in reality a modification of peritoneal cells. Hence, Beddard would regard the epiblastic »prostate« (Cementdrüse) of *Tubifex* as the homologue of the mesoblastic covering of the atrium of *Moniligaster*!!

It appears to me that, if this layer of cells in *Moniligaster*, *Stylaria* and other genera is really not surrounded by another layer of cells, but is itself peritoneal, then there will be no secretion passed into the atrium. Is there any known case of coelomic epithelium being converted into a gland which pours its secretion to the exterior? From Beddard's and Vejdovský's drawings these cells appear very similar to the chloragogenic cells surrounding the intestine and dorsal blood vessels in *Lumbricus* and other *Oligochaeta*. These cells have no communication with the intestine and do not merit the term »hepatic cells« which has sometimes been given to them. They have no function in relation to digestion, and I believe that the same is true in the case of the so-called »prostate« (Beddard) of *Moniligaster*².

University College, London, April 27. 1890.

7. Notizen über die pelagische Thierwelt der Seen in Kärnthen und in der Krain.

Von Dr. Othm. Em. Imhof.

(Schluß.)

eingeg. 5. Mai 1890.

14. St. Leonhard-See.

Protozoa: Flagellata:	<i>Dinobryon divergens</i> Imh.
Dinoflagellata:	<i>Ceratium hirundinella</i> O. F. Müller
	<i>Peridinium tabulatum</i> Clap. Lach.

² I may state, in regard to *Rhynchelmis*, which possesses a similar layer of cells outside the muscular coat of the atrium, that I can detect in sections a delicate membrane surrounding the pear-shaped cells — which is no doubt the true coelomic epithelium.

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