sation, que les individus adultes dont la cuticule est entièrement chitinisée. C'est pour cela que je distingue, dans l'état adulte des Gordiens, des âges différents, et que je détermine ces divers âges d'après le degré de chitinisation de la cuticule.

Il est évident que le Dr. Camerano ne se fait encore qu'une idée incomplète et inexacte de ma classification des divers stades du développement des Gordiens; et le malentendu me paroît provenir de ce que le zoologiste de Turin confond les deux acceptions que j'ai successivement données au mot »jeune«. Dans ma Monographie des Dragonneaux, je désigne ainsi les individus non adultes, vivant à l'état libre. Dans ma Revision des Gordiens, au contraire, j'applique cette dénomination aux individus adultes, libres ou parasites, dont la cuticule n'est pas encore entièrement chitinisée. Que je parle d'individus jeunes ou même très jeunes, il s'agit toujours d'individus adultes; et lorsque je me borne à faire mention de l'état adulte, c'est que je n'ai pas d'observations suffisantes pour apprécier le degré de chitinisation de la cuticule. Afin d'éviter toute confusion, je rattache maintenant à ma deuxième forme larvaire les individus filiformes non adultes, vivant à l'état libre (individus jeunes de Camerano). Ce sont bien des larves, puisque leurs organes génitaux ne sont pas encore parvenus à maturité et n'y arriveront jamais.

Le naturaliste italien conserve provisoirement comme espèces distinctes les formes désignées sous les noms de *G. Preslii*, *G. impressus*, *G. Perronciti*, *G. Rosae* et *G. Pioltii*. Il lui reste à prouver, contrairement à ma manière de voir, que les caractères invoqués jusqu'ici pour établir ces espèces ne représentent pas de simples différences d'âge, ou bien à découvrir d'autres caractères distinctifs. Je déclare de nouveau que je ne saurais admettre l'existence de ces soi-disant espèces, tant qu'on n'aura pas donné de leur état adulte des diagnoses réellement comparatives, conformément aux règles taxonomiques que j'ai formulées dans ma précédente Note.

Grenoble, le 22 Décembre 1887.

6. Note on a new Earthworm.

By W. B. Benham, D. Sc.
Demonstrator in the Zoological Laboratory, University College, London.

eingeg. 26. December 1887.

Amongst several earthworms kindly given to me last year by Prof. E. R. Lankester, there is one which presents several features, of interest: and although I have not, as yet, completely worked out its anatomy, yet from the fact of its possessing two pairs of nephri-

dia in each somite, a preliminary note may be of interest. The worm, which was preserved in spirit, measured only 50 mm, in length, and 6 mm, in breadth: it is thus very short in proportion to its breadth: and from this fact I have named it, provisionally, *Brachydrilus*.

Its locality is unfortunately unknown. The prostomium is small, but distinct: and the clitellum is not well marked — perhaps the worms are immature — but the ventral surface of the somites XVI to XXI, are thicker and more glandular-looking.

The setae are exceedingly minute: they are arranged in four couples, all on the ventral surface. In front of the clitellum the inner couples diverge from one another, till in somite VII, each inner couple is close to the outer couple of its side: so that here all four setae, of eade side, are close together. On the ventral surface of somite XVIII, is a deep transverse fossa: into which the spermducts open to the exterior: the anterior wall of the fossa is raised into two papillae in the line of ventral setae close to one another, which in the contracted state of the worm are directed backwards into the fossa.

Of the internal organs I need but say a few words here: the alimentary canal is provided with a gizzard in somite VI or VII: and in the next following somite is a pair of patchlike diverticula: each connected with the main canal by a narrow neck and having a structure very similar to that of the oesophageal glands of *Lumbricus* and other worms.

The seminal reservoirs are paired irregular masses lying in somites X and XI, attached to the anterior septa: these enclose the four ciliated rosettes, whence the sperm-ducts pass to the body wall: here they become imbedded in the very thick layer of connective tissue which in this worm lies within the longitudinal muscles. Where the two ducts of one side join, I have as yet not determined. There is no »prostate« or glandular diverticulum of the distal end of the spermduct: but on each side is a very large muscular (?glandular also) »atrium«, as in *Criodrilus* and *Titanus*: this occupies about six somites (XV to XX) and is doubtless due, in part at least, to the contracted condition of the worm, causing the dorsal wall of the above mentioned fossa to project in wards.

The ovaries lie in somite XII: an unusual position.

The spermathecae differ in structure and in position from those of any other worm except *Microchaeta*[1]. In the hinder part of

[1] Beddard, Trans. Zool. Soc. XII. 1886. pl. XV, and Benham, Quart. Journ. Microsc. Sc. XXVI. 1886. pl. XV, and XXVII, pl. VIII.

somite XI on each side, are two (sometimes three) small, oblong bodies, of as lightly glistering appearance which project backwards into the next somite — the ovarian somite. Each was found to contain spermatozoa, and to resemble closely the spermatheca in *Microchaeta*.

In all other worms but these two[2], and the altogether exceptional genus *Eudrilus*, the spermathecae are conspicuous sacs, situated in front of the ovaries, and usually in front of the seminal reservoirs.

In the same somites as the seminal reservoirs, viz. in X and XI, and lying under these organs, attached to the ventral body wall, are four white globular sacs on each side of each somite. These, I at first mistook for spermathecae, till I had examined transverse section, through this region: I then found that each of these sixteen sacs had a somewhat similar structure to the so called »capsulogenous glands« of *Lumbricus*. I prefer to call them, with Vejdovský — »albumen glands«; for I believe that they have nothing to do with the formation of the cocoon, but, that, as Hering supposed, they secrete the albuminous fluid, which is enclosed in the cocoon, and in which the eggs are embedded.

These »albumen-glands« have not so far as I am aware, been described or even mentioned in any other worm but *Lumbricus*. Their structure is simpler in *Brachydrilus* than in *Lumbricus*, and consists of a lumen, lined with short columnar cells, which are surrounded by a layer of muscles: outside these are situated the large glandular cells, with very granular contents.

Each sac opens to the exterior by means of a seta-follicle: or rather two albumen-glands open into the neck of each of the seta-follicles of the inner couple.

The nephridia, as I stated at the commencement, are four in number on each somite of the body, even in those containing the spermducts, and ciliated rosettes. Each nephridium corresponds in position to one of the couples of setae. The two pairs are equal in size, except in somites X and XI, where the outer nephridia are much larger than the inner ones, which are hidden by the seminal reservoirs.

The two nephridia of each side are quite separate from one another: and as far as I have noticed are similar: there is no muscular diverticulum, but the organ somewhat resembles that of *Lumbricus*, though the tube is much less coiled.

We already know, thanks to the researches, of Mr. Beddard, of worms possessing more than one pair of nephridia per somite. In *Acan-*

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[2] The spermathecae are altogether absent in *Criodrilus*, see Rosa, »Sul *Criodrilus lacuum*«. 1887 and Benham, Quart. Journ. Microsc. Soc. 1887. Feb.

thodrilus multiporus[3], he has described eight nephridia per somite: one corresponding to each of the eight setae, which in this species are separate.

In *A. dissimilis*: and *A. novae-zelandiae*[4] the nephridia are limited to the usual one pair per somite: but they alternate in position, from somite to somite, as in *Plutellus*[5]: but in *Acanthodrilus* the dorsal nephridia differ somewhat from the ventral series.

In other species of *Acanthodrilus*, in some *Perichaeta*, and in *Trigaster* (which may, herhaps, be a species of *Acanthodrilus*, as Mr. Horst has recently, suggested) the nephridia are represented by scattered tuft-like masses of tubules having all the appearance of true nephridia. But this is the first record of an earthworm in which two pairs of nephridia occur regularly in each somite of the body. I will not here enter, in any detail, into the bearing which this arrangement has on the theory of the genital ducts of earthworms being modified nephridia: suffice it to say that I do not see any reason to regard it as militating against Prof. Lankester's theory, if, instead of starting with two pairs of nephridia, on each side, one of which has disappeared except in the somites in which they have become modified as genital ducts, we take as the origin such an arrangement as obtains in many *Perichaetae* — viz. numerous scattered tufts of tubules. This I am inclined to think is the primitive arrangement, from which the usual condition has been derived by suppression of certain of the nephridia, and a concomitant increase in size of the remaining ones: whilst some of the primitive nephridia have, in certain somites taken the function of genital ducts.

Unfortunately we have no embryological data on this point, the latest writer on the development of the earthworm[6], although dealing with the development of the nephridia, makes no mention of the genital ducts.

London, Dec. 1887.

III. Mittheilungen aus Museen, Instituten etc.

1. Zoological Society of London.

17th January, 1888. — The Secretary read a report on the additions that had been made to the Society's Menagerie during the month of December 1887, and called attention to a small Fox from Afghanistan, presented by

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[3] Proc. Roy. Soc. 1885. p. 459. Proc. Zool. Soc. 1885. p. 822.
[4] Beddard, Proc. Zool. Soc. 1885. p. 822.
[5] Perrier, Arch. de Zool. Exp. t. II. 1873.
[6] Wilson, Journ. Morphol. Vol. I. 1887.