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ART. XXIV.—*On Lumbricillus macquariensis Benham.*

By W. B. BENHAM, D.Sc., F.R.S.

[*Read before the Otago Institute, 1st December, 1914.*]

IN 1904 I described a species of Enchytraeid from the Macquarie Islands under the name of *Lumbricillus macquariensis* (1, p. 295). Later, in 1909, I gave an account of a worm from the Campbell and Auckland Islands, to which I gave the name *L. intermedius* (2, p. 261). Recently I have received from Mr. Harold Hamilton additional specimens from the Macquaries, where he was collecting during his stay there as a member of the Mawson Antarctic Expedition; and I have been entrusted with the large series of Annelids, both marine and terrestrial, which was collected by that expedition. While studying the Enchytraeids I was led to re-examine my preparations of the specimens received at the earlier dates, and have arrived at the conclusion that the species "*L. intermedius*" is identical with *L. macquariensis*.

A comparison of the two accounts shows that the points of difference affect the following organs: (a) The nature of the spermathecal opening into the oesophagus; (b) the number of chaetae in each bundle; (c) the segment in which the dorsal vessel becomes free from the intestinal blood sinus; (d) the number of the subneural copulatory glands; (e) the size and proportions of the spermiducal funnel. †

A. The re-examination of the type of *L. macquariensis*, and of sections made of other specimens received at that time, shows that I made an error in affirming and figuring the existence of "a narrow duct" putting the spermatheca into communication with the oesophagus. And to this error I added some confusion in a note at the end of my account of "*L. intermedius*" by stating (p. 261), "It is quite distinct from *L. macquariensis*, which belongs to another group of the genus in which the spermathecal duct is strongly marked off from the ampulla." The latter statement is clearly a *lapsus calami*, for what was intended is evidently a contrast with the "narrow communicating-duct," and not with the external opening.

But it is difficult now to understand how I came to make the original statement as to the existence of the "narrow communicating-duct." The series of transverse sections show quite distinctly that there is no such "duct"—the ampulla communicates with the oesophagus by a small pore due to the sudden contraction of the ampulla, as I have described and figured for "*L. intermedius*" (pl. x, fig. 8).

In order to convince myself further I opened a specimen from the same lot, and it is certain that no such "duct" exists. The mounted specimen which served as the type, when studied without the knowledge derived from the other studies, does suggest a short duct, as the spermatheca is bent at a point close to its entrance into the oesophagus; but with the other evidence before me I recognize that the statement was due to faulty observation. (It is worth noting that Michaelsen made a similar error in his first account of *L. maximus*.)

Having discovered this mistake I proceeded to examine each of the other characters more carefully.

B. As to the chaetae, I find from a study of eight individuals that there is a considerable range of variation, as may be seen by a study of the annexed table, in which I have summarized the number of chaetae in the dorsal and ventral bundles in the pre-clitellar and in the post-clitellar region of the body of specimens from the Macquaries and from the Campbell and Auckland Islands. It will be noted that the difference between extremes such as No. 2 and No. 5 amongst specimens from the Macquaries is greater than the difference between No. 2 and No. 8 from two distant islands, and it is impossible to include in the diagnosis of a species a character with such a wide margin of variation.

C. It will be noted, too, that the segment in which the dorsal vessel originates shows a similar variation. It is true that in the type it commences at the hinder end of the 13th or 14th segment, while in the type of "*intermedius*," as I can confirm from renewed examination, this point is in segment 17; but even amongst those from the Macquaries the position varies, being in two cases in the 15th, in a third in the 16th, while in one that was sectionized it lies in the 17th segment.

D. The number of the subneural glands, which are characteristic of this genus, exhibits the same instability, for though usually there are 3 glands in segments 14, 15, and 16, there is one individual from the Macquaries in which there are 6 glands, and in two "*intermedius*" there are 4.

E. Finally, I made a point of the proportion of length to breadth of the funnel of the sperm-duct, for in the type of *L. macquariensis* I stated that the length is twice the breadth, whereas in "*L. intermedius*" I gave it as about five times the breadth. I have measured it in three funnels of "*intermedius*" whose outlines I drew with the camera, two in a series of longitudinal sections, and one in a bisected specimen mounted as a transparent object. From these measurements I find that the length is respectively five, five and a half, and six times the breadth.

I am unable to give measurements for the funnel of *macquariensis*, as it is bent in all the preparations, but the proportions given in the original statement seem to be borne out. But the state of preservation of the type is bad; the worm was soft, and it is possible that the gland-cells around the funnel are much swollen, just as those of the subneural glands are. In my figure of the latter (1, pl. xiv, fig. 8) they are represented as much too broad and too high. Without at that time having well-hardened specimens for study, I did not recognize the effect of this bad preservation on the gland-cells; but a comparison of the sections with well-preserved material shows at once the fact that the gland-cells are swollen, so that the whole gland appears larger than it would be in life. Hence again the difference between the figure of *macquariensis* referred to and that given for "*intermedius*" (pl. x, fig. 9).

So I think we may take it that in the case of the funnel gland-cells the same explanation may be given; their swollen condition increases the width of the funnel, and led me to give proportions which are no doubt untrue in life. It is not improbable, however, that the size of the gland-cells in both glands may vary according to the sexual condition of the worm, and it is likely that when fully mature in the breeding season the glands would be larger. I conclude, then, as a result of this comparison, that

“*L. intermedius*” is synonymous with *L. macquariensis*, so that this species has a distribution over the three subantarctic islands. The figures of the spermatheca, subneural glands, and sperm-funnel as given for “*intermedius*” must replace those given in the article on *L. macquariensis*.

Moreover, it is, it seems to me, closely allied to *L. maximus* Michaelsen (3, p. 10), from which it differs in its smaller size, for that is stated to measure 40 mm. in length, whereas our species does not exceed 25 mm., and some of the mature individuals are less; and the variety of *L. maximus* termed “*robinson*” is but 12–16 mm. in length, but the clitellum is interrupted on the ventral surface.

REFERENCES.

1. Benham. “On the *Oligochaeta* from the Southern Islands of the New Zealand Region.” *Trans. N.Z. Inst.*, vol. 37, 1905.
2. Benham. “Report on the *Oligochaeta*” in “Subantarctic Islands of New Zealand.”
3. Michaelsen. *Die Oligochaeten: Deutsche Sudpolar Expedition, 1901–3.*”

TABLE SHOWING THE NUMBERS OF CHAETAE, ETC.

—	Chaetae.				Subneural Glands.	Origin of D. Vessel.
	Pre-clitellar.		Post-clitellar.			
	D.	V.	D.	V.		
1. <i>L. macquariensis</i> (type) ..	6 (5)	5 (4, 6) <i>a</i>	4 (5)	5	14, 15, 16	13 or 14
2. “ (cotype) ..	6 (7)	6 (5) <i>b</i>	5 (4)	6 (5)	14, 15, 16	?
3. “ (H. H.) ..	5 (6)	6 (5) <i>a</i>	4	5	14, 15, 16	16 <i>c</i>
4. “ (H. H.) ..	6 (7)	7 (6, 5)	?	?	<i>d</i>	15
5. “ (H. H.) ..	4	5 (6)	3	4	14, 15, 16 <i>d</i>	15
6. “ <i>L. intermedius</i> ” ..	5	6	4	5	14, 15, 16, 17	17
7. “ ..	5	6 (7)	4	3 (4)	14, 15, 16	16
8. “ ..	6 (5)	7	5 (4)	6 (5)	14, 15, 16, 17	?

NOTES TO THE TABLE.

The numbers enclosed in brackets occur less frequently along the body.

a. In one segment there are 7 chaetae.

b. There is considerable irregularity throughout the body in this individual, the number in each bundle often differing in successive segments, and on the two sides of the body; thus each of the segments ii and iii has 8 chaetae on one side and 6 on the other.

c. In one individual sectionized the dorsal vessel occurs in the 17th segment.

d. In one individual there are 6 glands in segments 13–18, the largest being in the 15th; but in two other specimens only 3 glands exist, but I did not correlate them with the chaetal formula.

? The fact was not observed in these specimens.

H. H. Specimens collected by Mr. H. Hamilton.