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XXV.—Further notes on the structure of *Peripatus* *novæzealandiæ*

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primaries redder, the lines darker and less strongly undulated, the central line straight, the fringe less deeply white-tipped; secondaries with much less white on the fringe: wings below darker, the lines darker, the discal line of secondaries carried across the wing, as in *G. combinans*. Expanse 1 inch 10 lines.

Yokohama (*Jonas*).

G. fulvida (*Anomis fulvida* of Guénée) is a native of Java and the Andamans; we have also an example labelled "North India." Walker confounded a larger Indian species with it; but the latter is scarcely distinguishable from his own *Gonitis revocans* from Australia.

[To be continued.]

XXV.—*Further Notes on the Structure of Peripatus novæ-zealandiæ*. By F. W. HUTTON, Professor of Zoology in the University of Otago.

DURING the last three months I have dissected several more specimens of *Peripatus novæ-zealandiæ*, with the advantage of Mr. Moseley's paper before me; and I hasten to communicate the results, because I wish to correct several errors into which I have fallen, and to confirm, as soon as possible, Mr. Moseley's statement of the existence of male individuals.

Integumentary System.—The last joint of the legs consists of a short subcylindrical joint, on the upper and outer margin of which are three large papillæ, and below two large curved simple claws. On the fourth and fifth pairs of ambulatory legs there is a circular opening in the centre of the inner side of the first, or inner, tarsal ring—that is, on the fifth ring from the end. I am, however, doubtful whether the tarsi should not be considered four-ringed only.

Muscular System.—My supposed "salivary bags" (see Ann. & Mag. Nat. Hist. 1876, xviii. p. 364) are the same as Mr. Moseley's "retractor muscles of the head" (see Phil. Trans. vol. 164, pl. lxxii. fig. 1, *rm*). Mr. Moseley is right in calling them muscles; my mistake arose from believing the tracheæ on them to be internal instead of external. They are, however, the flexor or adductor muscles of the teeth. The pairs of teeth are not moved simultaneously. Generally their movements are alternate, but often one pair is moved several times, while the other is stationary; there is also a movement by which the two teeth of a pair are separated and approximated. The two pairs of teeth, when in use, sometimes touch each other at the tips; but they never cross.

Segmental Organs?—These are what I previously called “salivary vessels.” They form a series, on either side, unconnected with each other, but running into each leg, with the exception of the first three pairs. Each consists of a trunk coming out of the leg, which divides into two; and these branches, after several foldings, unite together, thus forming a closed loop. They are filled with colourless granulated cells. They were regarded by H. Milne-Edwards as nerves passing into the legs (*Ann. des Sci. Nat.* 2^e sér. xviii. p. 128*); but I have carefully dissected some out, and find that they have no connexion with the nerve-cord; and I also feel confident that they do not open into the body-cavity. Consequently I do not feel sure that they should be considered segmental organs.

Slime-ducts.—These pass from the oral papillæ along the back to about the centre of the body; they then turn forward and throw off branches; they then turn backward again, and reach nearly to the posterior end of the body. They are probably homologous with the supposed segmental organs.

Respiratory System.—I think Mr. Moseley is right in considering my “spiral fibres” tracheæ; but then all resemblance to the tracheæ of insects vanishes. Professor Ray Lankester is probably right in considering that the tracheal systems in *Peripatus* and in insects have been independently developed (*Quart. Journ. Microsc. Sci.*, Oct. 1877, p. 439).

Circulatory System.—I have succeeded in dissecting out the dorsal vessel; it contains a greenish-yellow fluid. Mr. Moseley is certainly incorrect in denying the existence of the “lateral canals” of Grube. It is satisfactory to me to think that I had demonstrated them before I knew that they had been previously described. Whether they belong or not to the circulatory system may perhaps be considered an open question; but they contain, especially at the anterior end, a yellowish-green fluid like that in the dorsal vessel.

Reproductive System.—By selecting small individuals I have succeeded in finding two males. Mr. Moseley’s description of the male organs is very accurate; but they lie above the alimentary canal, and not below it. With the exception of these two specimens, all the rest were what I consider to be hermaphrodite. They all had the organs described by me as testes; but in one individual the testis was absent on one oviduct, but present on the other. In the early spring (September) these contained no spermatozoa; but in November they were abundant. During all this time the oviducts were crowded with

* It is astonishing what a very full and accurate knowledge of the anatomy of this animal M. Milne-Edwards obtained by the dissection of one badly preserved specimen.

embryos, which would prevent any spermatozoa finding their way up from the vulva. This and the fact that the embryos in an oviduct are always (at least in my experience) in different states of development, convince me that the organs in question are testes, and not *receptacula seminis*, which is also contradicted by their cellular structure. The oviduct proceeds from the posterior end of the ovary, and not from the anterior end as shown in Mr. Moseley's figure. It also lies above the intestine, and not below it.

My observations of the development of this animal are not yet sufficiently extended for publication; but up to the present I have seen nothing to make me alter my views or accept those of Mr. Moseley.

Dunedin, Dec. 16, 1877.

XXVI.—*On the Genus Palæacis, and the Species occurring in British Carboniferous Rocks.* By R. ETHERIDGE, jun., F.G.S., and H. ALLEYNE NICHOLSON, M.D., D.Sc., &c.

[Plate XII.]

1. *History of the Genus and Species.*

IN 1836 the late Prof. Phillips, F.R.S., described a peculiar and anomalous coral, to which he gave the name of *Hydnopora? cyclostoma**; but, beyond the few words which form his diagnosis, he offered no remarks. It is needless to say that the coral in question has no affinity with the genus *Hydnopora*, a fact which Phillips himself appears in some degree to have surmised. Following in the footsteps of Phillips, M'Coy, in 1844, described his *Astræopora antiqua*†, and pointed out its close relationship with *Hydnopora? cyclostoma*, Phill.; indeed he considered the two might be congeneric, although specifically distinct, and he further indicated that the name *Astræopora* was more appropriate than *Hydnopora*. The same author in 1849, in a paper, "On some new Genera and Species of Palæozoic Corals and Foraminifera"‡, gave Hook Point as the locality of his species.

Messrs. Milne-Edwards and Jules Haime, in their magnificent work 'Polypiers Fossiles des Terrains Paléozoïques,' refer *H.? cyclostoma*, Phill., and *Astræopora antiqua*, M'Coy, with some doubt, to their genus *Propora* §, with the remark

* Geol. Yorkshire, ii. p. 202, pl. 2. figs. 9 and 10.

† Synop. Carb. Foss. Ireland, p. 191, pl. 26. fig. 9.

‡ 'Annals,' 2nd ser. vol. iii. p. 133. § Pp. 224, 225.