

ART. VI.—*On the Oviparity of Peripatus leuckartii.*

By ARTHUR DENDY, D.Sc., F.L.S.

[Read August 13, 1891.]

*Peripatus leuckartii* has proved to be by no means uncommon in Victoria, being recorded from a good many distinct localities, and exhibiting a remarkable series of variations in colour and pattern, as I have already described.\* Hitherto, however, little has been known of its habits, and nothing of its mode of reproduction. The only observer, so far as I am aware, who has said anything of its life-history, is Mr. Fletcher, who has described† four very young individuals, the progeny of a female kept by him in damp moss and leaves for four months (July to October inclusive). Mr. Fletcher did not observe the birth of the young, but found them in company with the mother when apparently only a few days old. He assumes, naturally enough, that they were born alive, as in all other species whose life-history is known; the viviparous habit being, indeed, one of the most remarkable characters of *Peripatus*.

In May last I obtained several specimens of *Peripatus leuckartii*, chiefly from Macedon, some of which I have since kept alive in a small vivarium specially arranged for the purpose. The vivarium consists of a large glass jar, with a flat glass top supported on two thin slips of glass slightly above the edge of the jar, in order to admit of free ventilation. To guard against drying up, from which cause I had previously lost specimens, I keep a small open jar of water inside the larger one, and the floor of the vivarium is thickly covered with very rotten wood, kept moist by the evaporation of the water.

In this vivarium *Peripatus* flourishes well, and the specimens may be inspected, when desired, by turning over the

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\* "Proceedings of the Royal Society of Victoria," July 11, 1889.

† "Proceedings of the Linnean Society of New South Wales," October 31, 1888.



rotten wood. On making such an inspection on the 31st of July last, I found that some twelve or fifteen eggs\* had been deposited beneath bits of rotten wood, and in crevices of the same. Careful examination showed that these were undoubtedly eggs laid by *Peripatus*. I collected all I could find and removed them, with some of the rotten wood, to a separate receptacle, and then carefully turned out the vivarium, and examined its contents. I found that there were present four specimens of *Peripatus leuckartii*, one male and three females, all apparently in good health,† and that there was nothing else which could possibly have laid the eggs, the largest living thing visible besides the *Peripatus* being a very small ant.

The vivarium was stocked on the 18th of May, and as I have carefully examined it several times since then, I am sure that the eggs must have been recently deposited. The view that they are really eggs of *Peripatus* receives strong support, if required, from anatomical examination of adult females. In these, I have nearly always found eggs in the uterus, but, although I have dissected specimens killed in December, May and July, I have never found embryos.‡ Moreover, the structure of the eggs *in utero* is very characteristic, and argues strongly against any idea of intra-uterine development. They are very large, oval in shape, and consist each of a very tough, thick membrane, enclosing a quantity of thick milky fluid full of yolk granules. I have only examined one egg microscopically after laying, as I wish as far as possible to watch the development; but this one agreed so closely with those found *in utero* that there can, I think, be no reasonable doubt of its identity. It was of just about the same size ( $\frac{3}{40}$  by  $\frac{3}{50}$  inch), of the same colour (very pale yellow), with a very tough membrane and a milky fluid contents containing very many yolk granules, but with no appearance of an embryo. The only difference concerns the almost chitinous-looking membrane which, instead of being smooth or nearly so, as when *in utero*, is exquisitely sculptured or embossed

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\* To determine the exact number would have involved breaking up the wood and thus disturbing the eggs more than seemed desirable.

† The male has since died, but the females were all still alive and apparently healthy on August 17th.

‡ The only July specimen dissected contained neither eggs nor embryos. Possibly the eggs had been recently deposited. The specimen was captured quite at the end of the month.



in a beautiful and regular design, consisting of little crumpled papillæ, somewhat resembling worm-casts, arranged at fairly regular intervals over the surface, and with much finer meandering ridges occupying the spaces between them. Such sculpturing is, as is well known, characteristic of many insect eggs, which renders it especially interesting in view of the relationships of *Peripatus*. As it is not present in intra-uterine\* eggs, it must be formed as the egg passes through the vagina, which is large and thick-walled.

It thus appears that *Peripatus leuckartii* lays eggs in July, or thereabouts; and it appears also, from Mr. Fletcher's observations, with which it will be seen that my own fit in very well so far, that the young are hatched at the end of October. As, however, I have also found large eggs in a specimen captured and killed in December, I think it not impossible that the animal may be double-brooded.

The mode of reproduction in *Peripatus leuckartii* thus seems to differ widely from that known in any other species of the genus, and to conform rather to the insect type. Probably, considering the immense quantity of food-yolk present, the development also differs widely; this I hope to be able to work out in time, but the presence of so much fluid and granular yolk, and of such a tough membrane, will, I fear, render the task very difficult.

It would be interesting to discover whether *Peripatus insignis*, the only other known Australian species, is also oviparous. The smaller size and much rarer occurrence of this species, however, will render investigation more difficult.

*Postscript.*—On August 31st one of the female specimens was found dead in the vivarium. I at once dissected it, and found the reproductive organs very well developed; but, although the ovary and oviducts were both large (the former containing a great many ovarian eggs), there was not a single egg in either of the oviducts. Doubtless, all the eggs had been laid. It is worth mentioning in this connection that another female specimen found at Macedon in May last (at the same time as the specimens which were placed in the vivarium) was dissected a few days after being captured, and was then found to contain no less than twelve large eggs in the oviducts.

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\* I have used the term "uterus" in accordance with the customary nomenclature, it would probably be better to speak only of "oviducts" in *Peripatus leuckartii*.



Up to the present time (September 4th) I have found no more eggs in the vivarium. The total number of eggs found is fourteen. This seems a small number for three females to lay, but probably the number laid varies considerably, as one specimen which I dissected some time ago contained only six eggs in the oviducts.

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