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Publisher: Taylor & Francis

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Annals and Magazine of Natural History: Series 5

Publication details, including instructions
for authors and subscription information:
<http://www.tandfonline.com/loi/tnah11>

On the circulation of the Larvæ of Ephemera

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Published online: 09 Oct 2009.

To cite this article: N. Creutzburg (1885) On the circulation of the Larvæ of Ephemera, *Annals and Magazine of Natural History: Series 5*, 15:90, 494-495, DOI: [10.1080/00222938509459372](https://doi.org/10.1080/00222938509459372)

To link to this article: <http://dx.doi.org/10.1080/00222938509459372>

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As regards the position of this group of obscure organisms, there is naturally a great temptation to place it between true fungi and *Bacteria*, though there is much to be urged against yielding to this.

G. M.

MISCELLANEOUS.

On the Circulation of the Larvæ of Ephemera.

By N. CREUTZBURG.

IN the microscopic investigations which I have made in the laboratory of the Zoological Institution at Leipzig upon the circulation of the blood in the larvæ of *Ephemera diptera*, I have succeeded in arriving at some interesting results, which I wish now to bring into general knowledge as briefly as possible, reserving a more detailed treatment of the subject to some future time.

My observations, in which I availed myself of M. Verlooren's memoir on the circulation of the blood in insects* as my foundation, had for their principal object the part taken by the dorsal vessel in the movement of the blood in the caudal setæ of the *Ephemera*-larvæ. This is effected, as indeed is shown by Verlooren in the above-mentioned memoir, by the contractions of a pyriform vessel, which, situated in the last abdominal segment, appears to be a direct continuation of the dorsal vessel, and on a superficial examination may easily be taken for its last chamber. This view is contradicted, however, by the circumstance that this vessel is quite independent of the contractions of the dorsal vessel.

With regard to this vessel Verlooren speaks as follows in the above essay (pp. 84, 85):—

“We find in it no lateral apertures with their valvular arrangement belonging to them, but in the middle a single apparatus, the valvular membranes of which are opposite in direction to the valves of the dorsal vessel. This apparatus therefore permits a flow of the blood from before backwards, a flow opposite to that occurring in the dorsal vessel.

“If this organ is connected with the posterior extremity of the heart, it may be furnished by the action of the latter with blood, which therefore will acquire a movement from before backward. This blood will then be communicated to it by the heart-chamber situated in the fourteenth segment. If no such union be present, blood may be conveyed into it from without, from the body-cavity, by the action of the valvular apparatus.”

The latter view appears to be regarded by Verlooren as in accordance with the truth, for he says (p. 84) it seemed to him that no communication existed between the heart and the vessel in question.

* Mém. couronnés de l'Acad. Roy. de Belgique, 4to, tome xix.

On the contrary, after a series of observations upon the most different objects, I have arrived at the conviction that this view is erroneous. I have succeeded in demonstrating the following facts:—

1. The vessel-like dilatation of the canals of the caudal setæ in the last abdominal segment is directly connected with the dorsal vessel. During the contractions of the heart it receives a portion of the blood which may be in the hindmost division of the vessel, and which it then by its own contractions drives into the canals of the caudal setæ.

2. A communication of this vessel with the body-cavity, so as to permit the entrance of blood into it in accordance with the above-mentioned opinion of Verlooren's, I have been unable to observe. There rather seems to me to be a firm union with the dorsal vessel.

3. The valvular apparatus situated at the anterior end of the vessel consists of two membranes parallel to the plane of symmetry of the body, which, as processes of the dorsal vessel, are directed backwards and attached in an inversion of the vessel.

4. These membranes, like the other valvular apparatus of the dorsal vessel, are set in motion by its action, only in the opposite way. They apply themselves together when the dorsal vessel expands, and open when it contracts, by which of course a flow of blood directed from before backwards is produced.

The latter fact is probably the best proof of the untenability of Verlooren's opinion. For if the vessel were to be furnished with blood from the body-cavity by the action of the valvular apparatus, the movement of the membranes must have stood in some relation to the phenomena of contraction of the vessel, which, however, is by no means the case.

On the other hand, scarcely any argument can be brought against the proposition established by me; on the contrary, we may easily convince ourselves by direct observation of the correctness of my statements.—*Zool. Anzeiger*, April 27, 1885, no. 193, p. 246.

On the Existence of a Nervous System in Peltogaster; a Contribution to the History of the Centrogonida. By M. Y. DELAGE.

Until quite recently the Centrogonida (*Rhizocephala* of Fritz Müller) were regarded as destitute of a nervous system. In a communication to the Academy*, and, more recently, in a more extended memoir †, I have shown that the nervous system exists in *Sacculina*. After this it was almost certain that it existed also in

* 'Comptes Rendus,' tome xcvi. (October 29, 1883).

† "Evolution de la Sacculine, Crustacé endoparasite de l'Ordre nouveau des Kentrogonides," Archives de Zool. expér. sér. 2, tome ii. 1884. [We do not see why Fritz Müller's name *Rhizocephala* was not retained for the new order; but, while accepting the new name, we shall not disfigure the pages of the 'Annals' by adopting the author's barbarous spelling.]