

II. "Preliminary Notice of an Investigation into the Coagulation of the Perivisceral Fluid of the Sea-Urchin." By E. A. SCHÄFER, F.R.S. Received November 8, 1882.

The perivisceral fluid of the sea-urchin is a coagulable fluid of about the same specific gravity and chemical composition as seawater. The corpuscles which float in it have been described by several observers, and recently very carefully by Mr. P. Geddes, in the "*Archives de Zoologie Expérimentale*" for 1880. The majority are pale and very amœboid, resembling the lymph-corpuscles of vertebrates, and the blood-corpuscles of most invertebrates. Others are more granular in appearance, and others again contain a reddish-brown colouring matter. The fluid in which they float is usually perfectly clear and colourless when the corpuscles are separated by filtration, and contains no appreciable amount of any proteid matter.

When the fluid is drawn from the shell into a glass vessel it rapidly undergoes what appears to be a sort of coagulation; the coagulum soon begins to shrink, and continues to do so to such an extent that at the end of a few hours it is reduced to but a small shred of coloured substance. In this respect the coagulum closely resembles that of vertebrate blood, and especially of frog's blood, which may also shrink in a few hours to a very small bulk.

If the clot is examined with the microscope it is found to contain all the corpuscles; and these are so closely arranged, and their processes are frequently so long and ramified, that it is difficult to make out the material in which they are embedded. The material of coagulation seems on this account to have been overlooked by Geddes, who refers the coagulum wholly to the remarkable massing together of the amœboid pale corpuscles, which he has observed and described.* It is easy, however, to demonstrate the presence of this material of coagulation, and to show that the phenomenon of coagulation is independent of the formation of masses or "plasmodia" of the corpuscles.

If the fluid be mixed as it flows from the shell with an equal volume of saturated solution of sulphate of magnesia, its coagulation is indefinitely delayed. With such a fluid the following experiments may be made:—

1. Diluted with water it immediately forms a coagulum which shrinks on standing as does the coagulum of the freshly drawn perivisceral fluid. The coagulum, when examined with the microscope, appears as a clear substance in which the cells, which are of course dead and for the most part rounded, lie separately embedded.

2. If the mixture be filtered all the corpuscles remain on the filter,

* *Loc. cit.*, and "*Proc. Roy. Soc.*," vol. 30, p. 252.

and a clear fluid passes through. This gives no coagulum on dilution, but the corpuscles, if removed from the filter and suspended in a saturated solution of sulphate of magnesia, exude abundance of the coagulable material on the addition of water. This is not unlike the results obtained by Mr. Wooldridge in the Leipzig Laboratory with white corpuscles from the lymphatic glands and from the blood of mammals.*

I have spoken throughout of the substance, upon the formation or exudation of which from the corpuscles the clotting of the Echinus fluid seems to depend, as coagulable material, and not as fibrine. It does not, in fact, either in its chemical reactions or in its microscopic characters, bear any sort of resemblance to the fibrine of vertebrate blood, but appears to be more nearly allied to mucin, although the possession by it of the remarkable property of spontaneously shrinking after its first formation gives it a deceptive similarity to fibrine.

The detailed account of the above investigation will be published in the "Journal of Physiology."†

III. "Preliminary Note on the Structure, Development, and Affinities of Phoronis." By W. H. CALDWELL, B.A., Caius College, Cambridge, Demonstrator of Zoology. Communicated by Dr. M. FOSTER, Sec. R.S. Received November 24, 1882.

Owing to the time that must necessarily elapse during the preparation of plates, it has seemed to me advisable to publish the following preliminary account of my observations on the anatomy and development of Phoronis. These studies were made for the most part in the Zoological Station at Naples. I am much indebted to Dr. Anton Dohrn for his great kindness and assistance. I have not thought it necessary in this preliminary note to refer at any length to the observations of previous investigators,‡ and the bearing of the facts on recent morphological speculation has at most been indicated in the briefest possible manner. I would, however, specially refer to some observations on the development made in the summer of 1881, by Dr. Hatschek, who most generously not only sent me material, but on his return to Naples resigned his work and drawings to me.

* "Proc. Roy. Soc.," vol. 32, p. 413; and "Archiv. f. (Anat. u.) Physiol.," 1881.

† The opportunity for carrying on these observations was afforded me at the Scottish Zoological Station of Professor J. Cossar Ewart and Mr. G. J. Romanes.

‡ J. Müller, Wagener, Krohn, Gegenbaur, Schneider, Kowalewsky, Metschnikow, Claparède, Wright, Dyster, Van Beneden, McIntosh, Wilson, &c.