

expressed by so excellent an observer as Weismann must command attention. Whether, however, the protrusible portion of the sarcostyle consists of a simple mass of protoplasm, or shows a differentiation into separate masses in the form of cells, is of little morphological or physiological importance, for such masses must be as destitute of a boundary membrane as the single protoplasmic mass in order to allow of their being the source of the pseudopodial extensions by which the sarcostyle is characterised.

While the views of Weismann have been in most points confirmed by the observations of Jickeli, a view somewhat different is taken by Mereschkowsky,¹ who believes that the sarcotheca contains an extension of the ectoderm, the cells of which do not lie close on one another, but leave between them spaces which are filled by a free protoplasm; and such a structure would be quite in accordance with the phenomena observed in the living animal.

We have, however, already seen that the ectoderm, in the modified condition which it often presents in the cœnosarc, may show an entire obliteration of cell boundaries and may throw out processes having many of the characters of true pseudopodia, and it needs but a further modification of this layer, consisting in a still lower grade of degradation towards the condition of undifferentiated protoplasm, in order that it may possess the faculty of emitting pseudopodia to the extraordinary extent which we meet with in the sarcostyles of the Plumularinæ; so that even though all the three body layers be present in the sarcostyles, we shall have in these appendages a portion which can scarcely be distinguished from undifferentiated protoplasm. If this portion be not free protoplasm it must be sought for in the ectoderm, for unless we are prepared to admit not only of an amœboid condition of the endoderm but of such a soft gelatinous consistence in the mesosarc as will allow of an indefinite extensibility in this membrane, we cannot believe that the endoderm and the mesosarc follow the pseudopodial outrunners of the sarcostyle.

Bodies in all essential points comparable with the sarcostyles of the Plumularinæ occur also in other Hydroids, and some very remarkable examples of these will be found in species first made known by the explorations of the Challenger. In *Perisiphonia*, one of the new genera of the Challenger collection, the peripheral tubes by which the axial hydrotheca-bearing tube is surrounded carry upon their outer sides multitudes of minute tubular cups whose finely granular contents admit of being protruded, as in the Plumularian sarcostyles, into the surrounding water (Pl. XXI. figs. 2*a*, 2*b*; Pl. XXII. fig. 2*a*); while in the singular and beautiful genus, *Diplocyathus*, a form nearly allied to *Halecium*, and also one of the discoveries of the Challenger, every hydrotheca is accompanied at its base by a similar tubular cup with protrusible contents (Pl. VIII. figs. 2, 3).

Whatever be the nature of the sarcostyles we must regard these bodies as true

¹ Mereschkowsky, Structure et Développement des Nématophores chez les Hydroides, *Arch. de Zool. Expér.*, t. x. p. 583.