Zoology Part LXX: Report on the Hydroida. Second Part - Tubularinæ, Corymorphinæ, Campanularinæ, ... By Professor G.J. Allman. E

them under the name of ganglion cells, and regards them as representing a differentiated nervous system. As seen in the tentacles of *Eudendrium ramosum*, they appear as well-defined nucleated masses of protoplasm, which send off outrunning tapering processes, usually three in number, and which under treatment with osmic acid appear thickly filled with black granules. Many of the outrunners, which the ganglion cells send off in the tentacles, unite with one another so as to form a plexus, while others lose themselves between the muscle fibrillæ, but no indubitable connection between nerve fibre and muscles has been found. Others again run to the thread-cells, and probably end close upon the cnidocil.

In other parts of the hydranth the form of these cells is less definite, and here they usually become accumulated in small heaps which lie between the ectoderm and mesosarc, and from which at most a single process is sent off to run between the ectoderm cells. Jickeli has sometimes seen a filament running between the ectoderm cells to a very minute cell with dark granular protoplasm and small elongated nucleus. He regards this as a "sense cell." Besides this mode of peripheral termination he believes that he has also seen one in the form of free nerve endings.

The ganglion cells also occur in great profusion in the cœnosarc. Nothing, however, has anywhere been seen in any Hydroid trophosome which could with any probability be regarded as a specially differentiated nervous centre.

Gland-Cells.—In some places certain cells of the ectoderm appear to act as gland-cells. Such cells have been described by Weismann in some species of *Eudendrium*, where they form a complete ring round the base of the hydranth. They consist of a firm protoplasm which readily takes up colouring matter.

In *Tubularia larynx* and some other species of *Tubularia* a bowl-shaped accumulation of cells, which forms a projecting collar, crowns the stem immediately below the hydranth like the capital of a pillar.[1] The cells composing this collar may also be regarded as gland-cells. A glandular function may also be attributed to peculiar elongated cells with a radial disposition which form the aboral extremity of the Actinula or free larva of *Tubularia* and of *Myriothela*. There can be little doubt that these cells are destined to give origin to an excretion by which the Actinula becomes fixed at the close of its free locomotive existence. Cells of a similar nature would seem to be present in the aboral extremity of *Hydra*.

Sarcostyles.—In connection with the ectoderm, perhaps more appropriately than elsewhere, may be described certain very remarkable zooids which are found throughout the whole of the Plumularinæ, where they occur in the form of minute fleshy outgrowths which are contained in cup-shaped or tubular appendages of the stem, and are in direct communication with the cœnosarc.

To these bodies special attention was called by Busk, who described them under the

[1] Gymnoblastic Hydroids, p. 407, pl. xxi. fig. 5.

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