

Now, the whole of the *nutritive* zooids or hydranths with the connecting coenosarc may be regarded as forming a distinct system, while the *generative* zooids or gonophores, along with such parts as they may be provided with for protection or otherwise, will form another. The former will constitute the *trophosome* of the colony, the latter the *gonosome*.

The zooids, which have just been referred to the trophosome and gonosome, have been found in all Hydroids which have been adequately studied, with the exception of some free Medusæ in which no independent trophosome is present (see below, p. xxviii), of *Hydra* in which the protection of the generative elements is not assigned to distinctly differentiated zooids, and of the somewhat enigmatical *Protohydra* of Greeff, which according to that author is a Hydroid presenting a condition of extreme simplification, being destitute of tentacles and multiplying only by division of its body.¹ In some, however, there occurs an additional set of zooids, whose functions, though scarcely yet ascertained with certainty, would seem to be in some cases chiefly that of the defence of the colony, as may be assumed of the "spiral zooids" of *Hydractinia*, and the "dactylozooids" of the Hydrocorallia; and in other cases that of the prehension of nutriment, as is probably the case with the nematophores or *sarcostyles* of the Plumularinæ and of a few other groups.

It will thus be apparent that the zooids of the Hydroid colony, with their various forms and definite functions, are the expression of a physiological division of labour, while as we advance towards higher groups of the animal kingdom we find the various kinds of physiological work assigned, not to different *zooids*, but to different *organs* which have lost the independence which more or less characterises the zooid.

IV. HISTOLOGY OF THE FUNDAMENTAL LAYERS.

What has now been said will serve to indicate the salient points of the morphology of the Hydroida. For an adequate conception, however, of Hydroid organisation, a more intimate knowledge of structure will be necessary, and this will be best acquired by a detailed examination of each of the fundamental tissue layers.

1. *The Endoderm.*

The endoderm consists generally of a single layer of prismatic cells, whose bases rest externally on the mesosarc, and whose opposite ends bound the common cavity of the colony. Those ends of the endodermal cells, which thus lie free in the nutritive cavity, are each provided with a simple flagelliform cilium, by whose vibrations the contents of the cavity are kept in constant motion.

In *Myriothela* the endoderm of the whole of the main cavity of the body forms a thick layer composed of many cells in depth. The cells, which in *Myriothela* form the

¹ R. Greeff, *Zeitschr. f. wiss. Zool.*, Bd. xx., 1869.