

entoderm of these forms, and there is therefore less risk of confusing their derivatives. The cellular constituents of the two layers are different, and in all the species yet examined they behave differently under the influence of staining reagents. The stomodæum also has a different structure from that of the external ectoderm and stains in a characteristic manner. Such a structure and characteristic staining is only found elsewhere in the rounded free extremity of the mesenterial filaments.

The mesenterial filaments themselves usually form elongate ribbon-like structures which contain a central strand of mesogloea clothed on each side by entoderm (*cf.* Pl. XV. fig. 5). The main portion of each filament not only has the structure of the entoderm, but also stains in the same manner. The free margin, however, has invariably quite a different structure and stains more deeply, and possesses all the characters of the stomodæal ectoderm. Frequently the mesenterial filaments are branched, as in the genus *Leiopathes* and other forms. In such cases the distal portion of the mesogloea is forked and each fork bears a number of entoderm cells on each side for some distance, but its extremity is clothed with a rounded mass of cells, which are indistinguishable from those of the stomodæal ectoderm. The free extremity of each filament consists of a single lobe in all the species studied, and I have never seen indications of the formation of lateral lobes of different structure, excepting in the rare and doubtful cases of *Antipathella subpinnata* already referred to. In this connection it is interesting to note that in the genus *Cerianthus*, the forms studied by von Heider, the lateral lobes (Flimmerstreifen) are much reduced and, as compared with those of many Hexactiniæ, are quite insignificant. This fact, taken in connection with the absence of the "Flimmerstreifen" in Antipathinæ, renders it possible that they may be phylogenetically of later origin than the median lobe.

In most Antipathinæ the ectoderm of the stomodæum may be distinctly traced to extend for a considerable distance along the free margin of the transverse mesenteries (*cf.* Pl. XIII. fig. 5, and Pl. XV. fig. 5). In the blastozooids, at any rate, the ectoderm appears to reach such a position before the mesenterial filaments are formed, and consequently any outgrowth of the free border of a mesentery to form a mesenterial filament must push before it a cap of ectoderm cells. Such, at any rate, appears to be the probable origin of the median lobe in Antipatharia, but the point must also be studied ontogenetically, and we already know that, in colonial forms, the development of blastozooids is not necessarily a repetition of the ontogenetic process.

#### GENERAL CONCLUSIONS.

The leading structural points brought out in this chapter may be summarised in the following manner:—

The *ectoderm* possesses the essential Actinian structure, but the nematocysts are