

increased development of mesoderm. At present we know next to nothing as to what cells in the sponge are concerned in the ingestion and digestion of food; in an Ascon we may fairly suppose that it is the choanocytes of the endoderm, for no other endodermal cells exist; in the higher sponges we have no reason to suppose that the choanocytes have lost this function, but at the same time we have no certain proof that the pinacocytal cells of the endoderm, which may be regarded as reduced or metamorphosed choanocytal cells, have lost it either; they have ceased to be agents of propulsion, but not necessarily of ingestion and digestion, indeed it is possible that with the loss of the former function the latter has become enhanced. Next it has to be noticed that the mesoderm not only increases in relative volume, but undergoes a change of character, as the type of chamber-system is raised; this change consists partly in its becoming more granular, the granules first appearing in the immediate neighbourhood of the flagellated chambers; this granulation is indicative of more active metabolism, and is probably connected with the acquisition of nutriment; it may be secretory, the mesodermal cells producing some solvent fluid, which subsequently enters the adjacent canals and breaks up the contained food into readily assimilated products, or it may be that the mesodermal cells are transformed epithelial cells, which, having obtained their share of food, have retired into the mesoderm to digest it. These and other conjectures, in the absence of exact knowledge, are open to us, but in any case we may probably connect the increased metabolism of the cells with alimentary processes; and if so, the increased development of the mesoderm is to be connected with the more granular character it presents in sponges with aphodal chambers. To render this conjectural explanation clearer, we may add a hypothetical account of the succession of events which led from the eurypylous to the aphodal type of chamber-system,—a change which has occurred independently in different groups of sponges, and which must be susceptible of a physical explanation. Commencing with a eurypylous chamber, we may suppose that some of the choanocytes near its mouth became transformed into pinacocytes, which acquired increased powers of ingesting and digesting food, this led directly or indirectly to an increased growth of mesoderm in their immediate neighbourhood; and consequently to a change in the form of the flagellated chamber, the apopyle of which became produced into a short tube or aphodus; from this followed increased efficiency in current-producing power, eddies being reduced; a further change in the same direction continued till the relative dimensions of chamber and aphodus were those of maximum efficiency.

#### DIPLODAL TYPE OF CHAMBER-SYSTEM.

The final stage in the modification of the chamber-system is that in which the incurrent canals, as well as the excurrent, are encroached upon by the mesoderm. The mesoderm increasing in thickness, reduces the lumen of the incurrent canal and the