SUMMARY AND GENERAL REMARKS.

As I intend to reserve the discussion of any questions which affect the Tunicata as a class till the conclusion of the second part of this Report, I have confined myself in the present section to a brief summary of the chief additions made by the Challenger expedition to our knowledge of the Simple Ascidians; to a few remarks upon structural points of novelty or interest, which are not sufficiently brought out in the systematic part; and to a discussion of the phylogenetic relations of the Ascidiæ Simplices, so far as our present knowledge of the group will permit us to make such investigations.

In the following pages the remarks upon the different species are arranged in the order in which the genera occur in the preceding systematic part of the work, beginning with the highest and working downwards.

Among the Molgulidæ the most interesting new forms are the two species of *Ascopera*. Like so many of the species from deep water, they have the posterior end of the body prolonged to form a peduncle by which the animal is attached. In this respect, and in having no hairs upon the test, and no adhering sand grains, they differ from typical Molgulids. These peculiarities are, however, found in one of the species referred to the genus *Molgula*, namely, *Molgula pedunculata*. The two species of *Ascopera* differ in all their internal organs as well as in external appearance. The branchial sacs are very distinct. That of *Ascopera pedunculata* (Pl. II. fig. 5) is regular, and has rather the appearance of the branchial sac of one of the Cynthiidæ, on account of the tendency of the stigmata to lie in transverse rows. In *Ascopera gigantea*, on the other hand, they are always irregularly curved and placed (Pl. II. fig. 1), and consequently the sac in this species has more of the characteristically Molgulid appearance.

Molgula pedunculata shows affinities with *Ascopera*, not only in having a short peduncle, and in the absence of adhering sand, but also in the structure of the branchial sac, which has the stigmata in some places very slightly curved, and arranged in transverse rows very much as in *Ascopera pedunculata* (compare Pl. V. fig. 3, and Pl. II. fig. 5). However, this Cynthiad arrangement is continued for short distances only.

The only other branchial sac among the Molgulidæ which requires special notice is that of *Molgula pyriformis* (Pl. VI. fig. 2). The longitudinal folds are in a rudimentary condition, exactly corresponding to that found in *Styela oblonga* and *Styela glans*, among the Cynthiidæ. The stigmatic portion of the sac does not enter into the folds, which are represented merely by longitudinal tracts, along which the internal