INTRODUCTION.

3. CLASSIFICATION.

The class Pisces, as understood in this work, includes craniate vertebrates with gills, and typically with median and paired fins which are supported by endoskeletal elements. Three sub-classes are recognized, viz. Cyclostomata, Selachii, and Teleostomi, which are, however, separated from each other by characters at least as trenchant as those which serve for the distinction of the classes of higher vertebrates, and which have therefore, with some reason, been considered as separate classes, in which case the term Pisces has been restricted to the Teleostomi. The Teleostomi approach the Batrachians in that they have typically a lung or its homologue, the air-bladder, and in the development of membrane bones. The Batrachia are well separated, however, by the absence of dermal fin-rays and of endoskeletal supports for the median fins, by the modification of the paired fins into pentadactyle limbs and of the hyomandibular into the stapes, and by the presence of true internal nares.

I especially lay stress on the last character, because the impression is prevalent that the Dipneusti have internal nares, and in this respect show affinity to the Batrachians. As a matter of fact, the Dipneusti, like other Teleostomes, have two external nasal openings on each side; these are situated on the under side of the snout, and when the mouth is closed the posterior and, to a certain extent, the anterior are covered by the lower lip. The posterior nostril is also covered by the lower lip when the mouth is closed in some Eels (e.g. Ophichthys).

True internal nares are quite different in structure and position to the posterior external nares of the Teleostomi, being paired perforations of the palate internal to the premaxillaries and maxillaries. Their ontogenetic development in the Batrachians, the lowest group in which they occur, supports the view that they are a new formation.

The Cyclostomes and Selachians are represented by only a few species in the fresh waters of Mexico and Central America, the bulk of the fish-fauna belonging to the Teleostomi, or bony fishes.

These may be arranged in two series—Actinopterygian and Crossopterygian. In the fishes of the Actinopterygian series the branchiostegal rays and supports of the paired fins retain their primitive condition or evolve by a simple process of concentration or reduction, whilst the duct connecting the air-bladder with the digestive tract, when persistent, opens dorsally or dorso-laterally into the latter. The fishes of the Crossopterygian series comprise the orders Crossopterygii and Dipneusti; these have