

of the experiments of this investigation. Most of the work was done on the heart *in situ*, but the isolated heart was also studied. For the former experiments, the fish was kept on its dorsal surface in a dish of water, the latter reaching sufficiently high to cover the gills but not flow over the exposed heart. The respirating centre was left intact. Under these circumstances, the heart may be maintained fairly normal for several hours.

Considerable differences in physiological behavior have been found in the hearts of fishes, some of which will be noticed under different headings in this synopsis.

*The Structure and Action of the Fish's Heart.* In the Selachians, as examined by the present writer in the shark and skate, the heart consists of a *Conus arteriosus*, in addition to the sinus, auricle and ventricle. This structure is pulsatile and seems to be the most sensitive part of the whole heart.

The corresponding *Bulbus arteriosus* of other fishes is highly elastic but not pulsatile.

In observing such a heart as that of *Batrachus* during systole of the ventricle, the longitudinal and transverse diameters of the latter are seen to be shortened and the antero-posterior lengthened. It is seen that the apex ascends and the bulbus descends.

In the Selachians, the beat is more highly peristaltic than in the hearts of other fishes, and in the former, a reversal of the order of pulsation for the different parts is most easily originated and maintained.

In some fishes, as in the eel [McWilliam] and *Batrachus*, there is a part of the heart intermediate between the sinus and the auricle proper, as to appearance, structure, and functions; and, as it is in most respects physiologically like a corresponding part in the Chelonians, has been named by me sinus extension in both fishes and Chelonians ["basal" wall, and "flattened" portion of Gaskell, "Canalis Auricularis" of McWilliam]. This part of the heart is often, under peculiar circumstances, in action when the auricle proper is quiescent, and then serves to conduct the wave of constriction on from the sinus to the ventricle.