to Fishes. In this latter class of animals, the two lateral hearts have united into a single central heart, while the aortic heart has entirely disappeared; and thus the position of the heart with respect to the two circulations is just the reverse of that which it has in the invertebrated classes.

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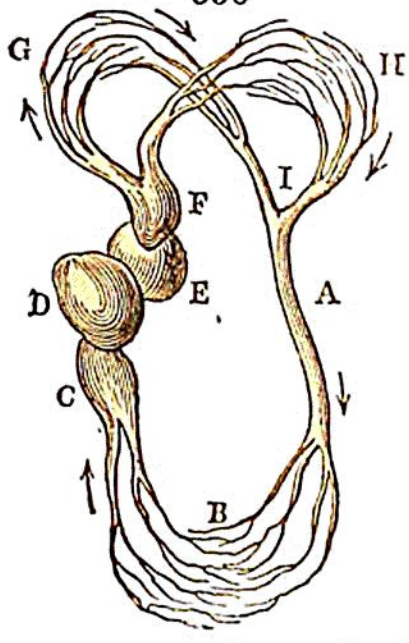

The plan in Fishes is shown in the diagram, Fig. 356, where the central organs are seen to consist of four cavities, C, D, E, F, opening successively the one into the other. The heart belongs exclusively to the gills; and there proceeds from it, not the aorta, but the trunk of those branchial arteries (F,) which convey the whole of the blood to the respiratory organs (G, H.) This blood, after being there aerated, is collected by the branchial veins (I,) which unite into a single trunk (A,) passing down the back, and performing, without any intermediate heart, the office of an aorta; that is, it divides into innumerable branches, and distributes the blood to every part of the system.* The blood is then reconveyed to the heart by the ordinary veins, which form a large vena cava (c.) This vein is generally considerably dilated at its termination, or just before it opens into the auricle, constituting what has been termed a *venous sinus* (s.) This, then is followed by the auricle (D) and the ventricle (E;) but, besides these cavities, there is also a fourth (F,) formed by a dilatation of the beginning of the branchial artery, and termed the *bulbus arteriosus*, contributing, doubtless, to augment the impetus with which the blood is sent into the branchial arteries.

* The caudal branch of the aorta is protected by the roots of the inferior spinous processes, joining to form arches through which it passes; and frequently the artery is contained in a bony channel, formed by the bodies of the vertebræ, which effectually secures it from all external pressure. In the sturgeon even the abdominal aorta is thus protected, being entirely concealed within this bony canal.