"Embryology, or developmental anatomy, is a highly specialized branch of anatomy, and comparative embryology furnishes such important evidence for evolution that Darwin referred to it as 'second to none in importance.' Ernst Haeckel brought this field into prominence in the immediate post-Darwinian period by the development of his Biogenetic Law, which states that 'Ontogeny recapitulates phylogeny.' Paraphrased, this simply means that embryos, in their development, repeat the evolutionary history of their ancestors in an abbreviated form. Described in outline according to this concept, the ontogeny of man indicates a long and complicated history. The fertilized egg is a single cell, and so corresponds to a protozoan ancestor. This soon becomes multicellular, and corresponds to a primitive metazoan grade of construction. Upon gastrulation, the embryo is coelenterate-like, but it soon reaches a triploblastic grade of construction comparable to the Platyhelminthes, or better, to the Nemertinea. Fundamental chordate characters (dorsal nerve tube, notochord, and pharynx specialized for respiration) are then developed. Fish-like characters are developed, such as gill slits and aortic arches, and a fish-like kidney (first a pronephros, then a mesonephros). Later tetrapod characters are developed, such as the pentadactyl type of limb, and a metanephric kidney. Finally mammalian, then primate, and at last specifically human characters appear . . .

"All vertebrate embryos develop a series (most commonly six) of aortic arches, each of which runs unbroken from the ventral aorta to the dorsal aorta, much as in adult Amphioxis. In the fishes, these arches are modified in several ways, all of which involve the separation of each aortic arch into a ventral efferent branchial artery and a dorsal efferent branchial artery, the two being connected by a capillary network in the gill filaments. In the Choanichthyes, the group of fishes most closely related to the Amphibia, the first arch drops out, and is largely missing in the adult, but its ventral and dorsal roots, together with new growths from them, form the major arteries of the head (the external and internal carotids.). The sixth arch has given rise to a pulmonary branch which supplies the lungs. This tendency for parts to drop out after having been formed in the embryo, and for the remaining parts to be diverted to completely different functions from the original purely respiratory function, is the principal factor in the embryology of this part of the circulatory system of all tetrapods. Among the urodeles, the main portions of the first and second arches drop out, so that now the carotids arise from the third arch. The third arch is broken by a capillary network early in development, but it soon becomes continuous again. The forsal connection between arches three and four disappears, with the result that the ventral connections now appear as common carotid arteries on either side, while the two fourth arches now supply the major circulation to the body. The fifth arch becomes reduced in size and may be lost altogether, while the sixth arch again gives rise to a pulmonary branch. In the Anura and in the reptiles, this process goes a little farther, with the fifth arch being lost completely and with the dorsal part of the sixth arch being lost, so that all of the blood entering the sixth arch must go into the pulmonary artery. The birds have essentially the reptilian system, with, however, the left fourth aortic arch degenerating, thus leaving the right fourth arch to carry the entire systemic circulation. In the mammals, it is the right fourth arch which degenerates and the left one which persists. Thus, of the six original pairs of aortic arches, only three persist in the highest classes of vertebrates. . . Arch three serves the head region, arch four