

(but only one of the pair) serves the systemic circulation, and arch six serves the lungs. Yet all six pairs are developed in the embryos of birds and mammals.

"A similar story could be told with respect to almost any organ system in any major group. The details differ, but the general facts are the same. When, in the course of embryonic development, a new organ system is formed, its structure is closely similar even in the most widely dissimilar species of the same class, or even phylum in many instances."

-- Edward O. Dodson, *A Textbook of Evolution* (Philadelphia: U. B. Saunders Company, 1952), pp. 56-61.

"At a certain stage of the ontogeny the embryo of a mammal has gill-pouches like fish, the skeletal supports of the gill-pouches, the arteries and veins which supply them with blood, the structure of the heart, in short, the entire plan of the circulatory system is fish-like. At a later stage most of the gill-pouches have been obliterated, but one is retained and converted into the Eustachian canal, which connects the throat with the middle ear, inside of the eardrum. Similarly, the embryological evidence shows that the lungs of air-breathers have been derived from the swim-bladder of fishes, a conclusion which had already been reached by comparative anatomy, for in a remarkable group, known as the Dipnoi or lung-fishes, the air-bladder is utilized for purposes of respiration.

### **"Vestigial or Rudimentary Organs**

"Another very persuasive aspect of comparative anatomy concerns vestigial or rudimentary organs. These are dwarfed and generally useless organs which are found in many plants and animals, relatives of which may have the same organ in a fully developed and functional condition. Perhaps the most widely known example is the vermiform appendix of man. This small structure is without any known function in man, and it is notorious as a seat of disease. In other Primates, however, this organ is considerably larger than in man. And in mammals which eat a coarse diet, involving considerable amounts of cellulose, the appendix and cecum form a large sac in which mixtures of food and enzymes can react for long periods of time. The appendix of man is easily understandable as a degenerating legacy from ancestors with a much coarser diet; but it is inexplicable why a useless and disease-ridden structure should have been created especially to plague him.

"Weidersheim has listed nearly 100 such vestigial characters in man, and a few more of these may be discussed. In the inner corner of the eye of all vertebrates there is a transparent membranous fold, the nictitating membrane. In most vertebrates, this 'third eyelid' can be swept clear across the eyeball to cleanse the latter, much like the blinking of a mammal. In birds, the nictitating membrane is particularly well-developed. Its use can be easily observed if a captive owl is watched by daylight. But in mammals, it forms a mere crescentic fold at the inner corner of each eye. This rudiment has no known -- or probable -- function. It is understandable, like the vermiform appendix, only as a degenerating inheritance from an ancestral line to which the nictitating membrane was actually useful, as it now is to the majority of vertebrates. The ear muscles of man present a similar situation. Many mammals are able to move the external ear freely in order to detect sounds efficiently. The complete muscular apparatus for these movements is present in man, but the muscles are quite vestigial. While school