



lectures delivered in  
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## The Rise of Evolution

### Lecture IV, Part XIV

In recent years a number of books have been published containing colored pictures and diagrams of each of the various systems operating within the human body. One picture will present a human skeleton, giving a vivid idea of the approximately 200 bones that make up the human frame, showing their very practical arrangement, and even conveying an idea of the great variety of types of joints that connect them. Another picture will show the muscular system, illustrating the different kinds of involuntary muscles that are involved in enabling the organs of the body to carry out their functions, and also the kinds of voluntary muscles that permit the individual to make full use of his hands and feet. A third picture may show the circulatory system with its intricate arrangement of arteries and veins to carry blood to and from every portion of the body. Still other pictures represent additional complex mechanisms extending through many parts of the body and using many different organs. That all of this should have developed from a single beginning by purely accidental changes as a result of mutations occurring at rare intervals is quite inconceivable.

### HEART AND LUNGS

Yet such an overview of the various systems that are intertwined within the human body can only begin to give an idea of its complexity. Many of the individual organs are marvels of skillful construction. Thus the heart, which weighs considerably less than a pound, pumps between 10 and 13 pounds of blood every minute. In the course of 24 hours this small organ exerts as much force as would be required to lift a man of average weight to the top of the Washington Monument.

The blood carries many complicated chemical materials to the various parts of the body and removes waste material from them. One of its most important functions is to carry oxygen to all parts of the body.

After the blood returns to the heart it is sent to the lungs to discharge its carbon dioxide and to receive a new supply of oxygen. Anatomists tell us that there are

about 700 million alveoli, or air sacs, in the lungs, and that the surface of the membrane through which the blood receives oxygen from these sacs is more than fifty times as extensive as the area of a man's entire skin, or more than twice as large as the floor of an average living room. Yet all this is so arranged as to occupy a comparatively small space within a man's chest.

### THE HUMAN EYE

It is difficult to imagine that such efficient and complicated instruments as the heart and lungs came into existence simply through sporadic and relatively infrequent mutations. The improbability of their having been formed through such an evolutionary process comes into sharp relief when we look at the intricate construction of the human eye. Its structure involves a number of various types of cells. Two of these are known as rods and cones. The cones are used primarily for daytime seeing, the rods primarily for vision at night. The eye of the owl, which is a night animal, has mostly rods; that of the chicken, which is active during the day, has mostly cones. In the human retina there are about 100 million rods and about six million cones. When affected by light, these rods and cones excite the million nerve ends which are connected to them, one nerve end being connected to many rods or cones. Each of the two eyes receives an image reversed and inverted by the lens. Since each eye has a different perspective there are two somewhat different pictures on the retinas. Yet these pictures are so combined in the brain as to give the sensation of seeing one picture, and of being able to observe not only form, color, and motion, but depth as well.

The invention of intricate television sets represents a triumph of human technology. These sets last only a few years and often have to be repaired. Despite the careless way that many people abuse their eyes, the human eye often gives good service for seventy years or more without the necessity of repairs. It is a far more intricate device than any television set. Truly it is one of the most wonderful things that God has made.