

drink, the amount of bodily exercise, the state of the atmosphere, and all the other events that may affect the ingestion or excretion of fluids. According to these conditions it may vary from 70 to 79 per cent. Uniformity is, however, maintained, because whatever tends to lower the proportion of water in the blood, such as active exercise or the addition of saline or other solid matter, excites thirst; whilst, on the other hand, the addition of an excess of water to the blood is quickly followed by its more copious excretion in sweat and urine.

24. The resemblance of flesh and blood, so far as their chemical composition is concerned, is so great that the blood has been aptly termed "flowing flesh," and the results of the ultimate analysis of the blood and of the flesh of the ox so resemble each other that the elementary composition of their organic constituents may be considered identical, and may be represented for both as carbon 45, hydrogen 39, nitrogen 6, and oxygen 15.

25. The purpose of the Blood appears to be threefold. First, to provide materials suitable for the nutrition and maintenance of all the parts of the body; second, to convey oxygen to the several parts, whether for the discharge of their functions or for combination with their refuse; third, to bring from the same parts this refuse and convey it to where it may be discharged. The first is the primary purpose of the blood, but the second and third are essential to life, and will be more especially considered hereafter.

26. The circulation is the means by which these various purposes are accomplished, because it is necessary that the blood should be constantly moving through all the parts, and, at certain periods, should be exposed to the atmosphere, in order that it may absorb oxygen and emit carbon dioxide, water and other waste matters. To this end it is provided in man and all warm-blooded animals, that all the blood, which has passed once through the several parts of the body, shall traverse the lungs and be exposed to the atmosphere before it again takes the same course. The course through which the blood moves, in order to accomplish this object, may be thus described.

27. The general circulation (Fig. 1) commences at the *left ventricle of the heart (lv)*, blood being impelled into the *aorta (ao)* and along its successive branches, the *systemic arteries (a, a, a, a)*, through which all the organs of the body, except the finer textures of the lungs, derive