number of small bags or cells, all closely packed together. These cells connect by means of the bronchial tubes and windpipe with the air, through the nose and mouth. They vary in size, but on an average are about 1-100 of an inch in diameter and the total number of the cells in the lungs has been estimated at 600 millions. Their walls are exceedingly thin and the cells may therefore, be easily compressed. The whole mass of the lungs is also exceedingly elastic and by the action of a system of muscles, their volume is alternately increased and diminished in the process of respiration. The amount of air which is thus drawn into the cells and again expelled at each inspiration, differs in different individuals. The average quantity in ordinary tranquil respiration of an adult is a pint; but in a full respiration, it may be as much as 2½ pints, and by an effort, the lungs may be made to inhale from 5 to 7 pints. As the average, in health, is about 18 respirations per minute, which corresponds to about 18 pints of air inhaled and exhaled, it follows that about 3,000 gallons of air pass through the lungs of an adult man every day, Some estimate it as high as 4,000 gallons a day for an average in ordinary circumstances and as high as 5,700 gallons a day for an athletic man undergoing severe exertion. In order that you may form an idea of this quantity, I will add that 4,000 gallons would fill a room measuring 8½ feet in every dimension.

Let us now turn to the blood and examine the apparatus by which it is exposed to the air in the lungs. As we have already seen, the blood charged with sugar is received into the heart, from whence is is pumped through a tube called the pulmonary artery into the lungs. This artery divides again and again until it is reduced to very small capillary tubes, which ramify on the surfaces of the air cells. The walls of these capillaries are formed of the thinnest conceivable membrane, so as to bring the blood into as close a contact as possible with the air. Here oxygen gas is absorbed in large quantities and carbonic anhydride given off. The blood now holds in solution, at the same time, oxygen gas and sugar and thus charged it returns by a series of veins to the left side of the heart, when by the second of the two force-pumps, it is again forced through the general circulation of the body, and whilst this is being accomplished the oxygen burns up the sugar. Sugar like wood consists of carbon, hydrogen and oxygen. The last two are present in the proportion to form water, so that sugar may be said to be composed of carbon and water. Of these two substances the carbon only is combustible. This during the circulation of the blood, is slowly burnt up by the oxygen and converted into $CO_2$, carbonic anhydride, which remains in solution until it is discharged, when the blood returns again to the lungs or else escapes through the skin. Thus it appears that respiration in a process of combustion, in which the fuel is sugar and the smoke carbonic anhydride and aqueous vapour. I need not dwell upon the fact so universally known as the presence of carbonic anhy-