

"It is to be observed, therefore, that the atmospheric air consists principally of two invisible fluids or gases, called oxygen and nitrogen. With them is combined a very small portion of hydrogen and carbon. Every animal has lungs or air vessels. These vessels in brutes are called lights, and in slaughtered animals are familiarly known to all. They resemble in structure a common sponge; the interstices of the former are designed to receive the air we breathe.—They are located in contiguity with the heart on as to bring the air received by them in contact with the blood as it passes through the heart. As we open the mouth the air rushes into it, and thence into the lungs, filling all these interstices, so that they become swollen or expanded, like a bladder or an air tight bag when we force the air into it. By a mechanical muscular action of the chest upon the lungs, as soon as the air has accomplished the object of its mission there, speedily to be explained, they are compressed so as to force from them the air before received, now become foul; and as soon as it is thus ejected, before the mouth closes, another current of fresh air rushes into it as before. Thus at every opening of the mouth one current of polluted air is forced out of from the lungs, and another current of atmospheric or pure air through the same channel, rushes into them.

"The air we breathe, or which we thus receive into the lungs, is worked off by a process similar to combustion. The lungs might not hence be improperly called a furnace to decompose the air, the same as a stove is a furnace to burn up or decompose the wood or coal placed in it for combustion and the generation of heat.

"Accordingly, the oxygen of the air, being separated from the nitrogen, when in the lungs, is employed to clarify the blood of its impurities, which are constantly accumulating, not unlike the clarifying of coffee or any liquid by the application of a gelatine substance. The blood, before being thus clarified is of a dark brown or blackish colour, and thick or clotted. This dark colour and coagulated consistence is occasioned by the carbon and other impure substances with which it had become impregnated in passing through the system. But when the blood is clarified or renovated by the action upon it of the oxygen in the lungs, it is of a bright red colour, and then passes through the arteries to every part of the animal frame, yet in its passage is constantly gathering up impurities, with which it was previously loaded. On reaching the extremity of the system, it passes into another set of vessels called veins, to answer the purpose of a backward track of a railroad, and thus it returns again to the head, dark and clotted as before, thus again to be purified by its contact with the fresh oxygen of the lungs.

These processes of inhaling fresh or oxygenated air, or breathing; then of purifying the blood; and then of collecting the carbon and other poisonous substances of the animal system, are continued to the end of life; that is, if they are discontinued, the lamp of life would go out, as flame will be extinguished when the gas or oil which fed it is exhausted.

Thus to purify the blood, the oxygen is all extracted from the air conveyed to the lungs by breathing, and is literally burnt up; as much so as the fuel placed in a stove; and will no more answer for the purpose a second time, than the ashes from the fuel already consumed in combustion would answer to make a new fire; or than the skins of grapes, after the juice had been extracted, would answer to make wine; or than excrements of animals would again answer for food, after all the nutritious elements had been removed in its first use. Indeed we can no more use the air in breathing a second time, than we can use our food the second time.

"The former in use becomes as foul as the latter; not only as foul, but as inefficacious for its legitimate agency. Hence no one can fail to perceive the necessity for a constant supply of pure air in breathing and consequently in the preservation of life. To attempt living without it would be as absurd as to attempt living without food. Moreover, we could live an hundred times as long without the latter as we can without the former; and to mix arsenic with our food would be comparatively no more fatal to the vital principle, than to mix a poisonous gas with the air we breathe.

"It is a well known fact that we breathe eighteen or twenty times every minute; and at each breath we inhale or take into the lungs about one pint of air, or over two gallons each minute. Thus in an hour an adult person consumes more than one hundred and twenty gallons, so that if he were enclosed in a hogshead containing one hundred and twenty gallons, before the end of an hour the whole of the air contained in it would be exhausted, and he would die for the want of the vital principle which pure air imparts in breathing.

"It is well ascertained, that animal life depends on having a constant supply of atmospheric air, as it is that there must be a supply of food; and where this supply is deficient breathing will become difficult. It will be difficult also if the air is impure. The cases on record are numerous where persons have suddenly fainted and died from entering deep wells, caverns, and vaults filled with noxious vapors. So they are of no rare occurrence where persons have died when sleeping in close rooms containing charcoal. The vapors thus inhaled are in reality the same as those ejected from the lungs in breathing. In the one case the carbonic acid gas is generated in the little inn or pipe clay furnace; in another case, it is generated in the lung, already said to be analogous to any other furnace. This is the only difference.

"Hence if a prisoner were shut up in a cell perfectly airtight, containing the cubic measure of twelve such hogsheads, or if any one were to attempt sleeping in a room airtight of that capacity in about ten or twelve hours the air would be so foul from use in passing through the lungs, that if life did not become extinct, breathing would be barely practicable. Or if four persons were to sleep in an air tight room of the capacity of forty five or fifty such hogsheads, in about ten or twelve hours they would all become incapable of breath-