

Individual Hygiene.

THE LUNGS AND HOW TO PRESERVE AND STRENGTHEN THEM.—Continued.

In the last number of the JOURNAL, in the first part of the article on this subject, the following illustrations were inadvertently omitted. Consequently the last three paragraphs of that part, on the movements of the walls of the chest, will be more fully understood if read with the illustrations in view.

The quantity of air drawn into the lungs at each breath is small when compared with the quantity the lungs will hold. The lungs are not filled to their greatest capacity, nor nearly emptied, at each breath. The lungs of a full sized man will hold, when stretched to their utmost, about 300 cubic inches of air. But after an ordinary inspiration they actually contain only about 200 cubic inches, or about two-thirds of what may be drawn into them by a forced inspiration. Bear this in mind. Only one-eighth of this, on an average—25 cubic inches, is pumped in and out at each respiration. After an ordinary expiration, therefore, his lungs will contain 175 cubic inches. The one-eighth of the usual air contents of the lungs, which is pumped in and out at every breath, is called tidal air, and that remaining after each ordinary expiration is called stationary air. There is then, observe, always a large amount of stationary air in the lungs. Gases diffuse and mix rapidly. The tidal air drawn into the lungs at each inspiration quickly mingles with the stationary air already in the lungs, and the few cubic inches of air almost immediately expelled by expiration is not the same that had been just drawn in by inspiration—the tidal air, but a mixture of tidal and stationary air.

The blood in the lungs, as it moves along in the capillaries, is thus constantly bathed with air, which is partly renewed and purified at every breath. As often as once every minute, it appears, all the blood in the body flows through the minute vessels in the lungs, giving off all the while, to the air in the lungs,

carbonic acid, watery vapor, and other matters, which have greater affinity for air than for blood; and taking in all the while, from the air in the lungs, oxygen, which has a greater affinity for blood than for air. Blood just before it passes into the lungs is dark purple, and is called venous blood. It has been the round of the circulation—to all parts of the body, and has taken in a lot of waste matters, chiefly in the form of carbonic acid and watery vapor, the former making it dark in color; flowing to the heart, it is thence forced on to the lungs to be purified and oxidised. In passing through the lungs, giving off carbonic acid and water and taking in oxygen, it becomes of a bright red tint—arterial blood; and flowing back to the heart it is sent again to all parts of the body. If you could obtain some venous blood from the vessels just before it had entered the lungs and, in a separate vessel, some arterial blood just after it had passed through the lungs, you would be surprised at the difference in color.

The lungs therefore perform a double function. They take in the oxygen which the organism requires, and without which we cannot live many minutes; and they cast out a large amount of the worn out waste matters of the body, especially the products of combustion, which if retained in the blood would soon destroy life.

It is therefore easy to understand how very important it is for the lungs to be sufficiently developed to prevent the accumulation of these poisonous matters in the blood, and also to be capable of taking in abundance of oxygen for the wants of the system.

HOW THE LUNGS MAY BE DEVELOPED.

The size of the lungs may be increased by the exercise of frequent deep inspirations. The person, out of doors in a pure atmosphere if possible, should stand perfectly erect with the hands hanging down at the side or resting on the hips, and then gradually and slowly draw in air through the nostrils until the lungs are well distended and filled, hold the breath for a few seconds, and then gradually and slowly expel air until the lungs again assume their natural state in expiration. This should be done three or four times or even oftener in succession;