SURGERY ON THE FARM AND IN THE HOME.

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"OUR BOYS" FIRST AID TO THE INJURED ASSOCIATION.

Part II.

THE MUSCULAR SYSTEM.

The word muscle is generally understood to mean flesh. With this the bones are clothed, thus giving shape to the limbs. The muscles are arranged in masses of flesh which have attachment to different bones. Each muscle has its own work to perform, and, by contraction, the bone, to which a given muscle is attached, is moved, the movable bone being drawn towards the fixed one. Thus, in walking, running, or carrying a weight, several of these muscles, or masses of flesh, are contracted and the desired movement obtained. The muscle or muscles which move a part are not always placed close to it. As, for instance, the movement of the fingers is obtained from muscle to be found attached to the bones of the forearm. In a case like this the flesh terminates in a long fibrous cord or sinew, called tendon, which is attached to the bone and so the necessary movement is obtained. In some parts of the body the muscles are attached to the skin and also to one another as in the face, giving it different expressions. The mucles of which we have been thus far speaking of are under the control of the will, and are known as "voluntary muscles," but there is a second class, very important, too, which act independently of our will—the "involuntary"—they are not attached to the bones, but are connected with internal organs, which, if they were under the control of our wills the result would be dangerous, if not fatal. The heart, for example, contracts and expands day after day, and year after year, without any effort on the part of the mind; when you are asleep it works on the same as when you are awake, if it did not where would you be after to-night's sleep? That poor stomach, too, into which you cast all sorts of things! It is possessed of involuntary muscles and does its work without an effort on the part of your will, though, alas! too often not without an effort on its part.

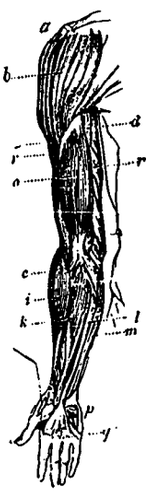

Fig. 1.—MUSCLES OF THE ARM.

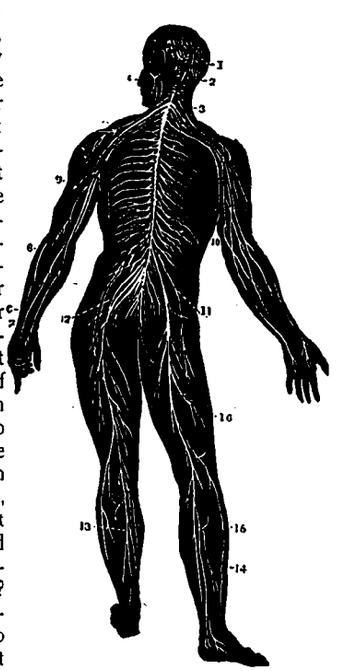

Fig. 2.—THE NERVOUS SYSTEM.

This figure shows the general arrangement of the nervous system—the brain proper or large brain, 1, and the small brain, 2, in the head; the spinal cord or spinal narrow—a continuation of the brain—along the back; and the nerves, 4, 5, 6, 7, 8, etc., coursing from either brain or spinal cord to all parts of the body.

THE NERVOUS SYSTEM.

The brain, spinal cord or marrow, and nerves constitute this system, together with what is known as the sympathetic nervous system. The brain, as you will remember we explained in last paper as being enclosed and protected by the bones of the skull, consists of two parts, the larger part, the brain proper, and the little brain situated in the lower and back part of the skull. The "large brain" is the seat of intelligence and the will; the "little brain" regulates the movements of the body, maintaining the balance or equilibrium during different actions.

The brain and its continuation, the spinal cord, form the central portion of the nervous system. From them branch off the nerves, nine pairs from the brain and thirty-two from the spinal cord. These cords divide and subdivide and finally end in the volutary nuscles and the organs of sense—eye, ear, nose, tongue. The nerves serve very much the same purpose as the telegraph wires, orders being flashed along on them to the voluntary muscles and as a result the part to which the message has been sent is put in motion. This class are "nerves of motion" or motor nerves, while those which convey the sense of pain, as in the case of a burned hand or foot or impression of objects, as sight, are called "nerves of sensation," or sensory nerves. The reader has doubtless seen those cases where, as the result of a severe injury to the spine, the patient loses the use of lower limbs, and at the same time all sense of feeling. The telegraphic communication has been broken by the injury to the spinal cord. Remember when a motor nerve is cut by an accident there is loss of power in the muscles where it terminates. In the case of a sensory nerve there is loss of sensation in the part where it ends. We would briefly say that the involuntary muscles are kept under control by the sympathetic system referred to above.

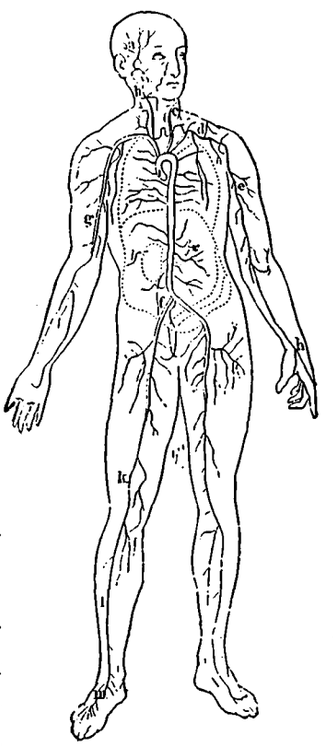

Fig. 3.—THE ARTERIES.

ORGANS OF CIRCULATION AND BLOOD.

We have briefly considered the telegraph system; now we will look at what is, perhaps, to most people, one of the most interesting features in the human system, the heart, with its never ceasing pump, keeping up a constant circulation of 12 or 15 lbs. of blood through miles of pipes, and what is more wonderful still—two kinds of blood which never mix. The circulation of the the blood was discovered by an Englishman, John Henry, 1620. Close your hand, reader, and you will have an idea of the size of your heart, which is a strong, muscular body situate in the chest cavity between the lungs. It is somewhat conical in shape, divided into two parts, right and left side; it dilates and contracts with great regularity about 70-75 times a minute. The left side contains bright scarlet blood, loaded with nutriment derived from the food and oxygen from the air we breathe, and the right side of the heart purple blood charged with carbonic acid gas and products of the wear and tear of the body. This blood is pumped to the lungs to be purified, while that of the left side is pumped into the tubes called arteries and distributed by them to the most distant parts of the body. The arteries are strong and elastic, and are generally well protected by the muscles and bones. Some are near the surface and the blood can be felt pulsating through them, the successive waves being due to the pump-like action of the heart. I shall not burden you with the names of these arteries, but refer you to the figure, and from it to your own body, for the location of most of the larger vessels. The arteries divide and divide again until at last they terminate in very fine tubes, capillaries. It is whilst passing through these capillaries that the arterial blood gives up its oxygen and nutriment and takes up the results of decay and wear and tear. From the capillaries it flows into the veins, and, in a continuous, sluggish stream, continues in them to the right side of the heart, which pumps it to the lungs where it again enters a network of capillaries and becomes acted upon by the air we breathe, the oxygen of the air being given to the blood in exchange for the carbonic acid gas of the blood. From the capillaries of the lungs it again enters veins and is poured by them into the left side of the heart to be distributed to the body as before.

RESPIRATION OR BREATHING.

As just stated the blood is purified in the lungs; they are the organs of breathing—the right and left—lodged in the chest cavity. *Inspiration*: The air rushes through the nose—Note, *the nose*—down a tube, the wind pipe, the upper end of which contains the organs of the voice; the lower end divides into two branches, then into many and minute ones which end in little pouches or sacs—*air cells*. It is around these sacs that the capillaries lie containing the impure blood. The air we breathe in rushes down into these cells; and it is here the change of oxygen takes place from the carbonic acid gas, therefore you will see that the expired air is impure; hence how important, young reader, that the *inspired* air should be of the purest. But you ask me what causes the air to enter and leave the lungs? Well, turn back and look at the skeleton. You will see the ribs form the wall of the chest, and again, read its boundary. During *inspiration* the foreportion of the ribs are raised and the midriff or diaphragm descends thus enlarging the cavity, and the air rushes into the elastic cells; while during *expiration* the midriff ascends and the ribs are depressed and the air is driven forcibly out. This action goes on in health about 15 to 18 times a minute.

LIMED EGGS.

The *Poultry Keeper*, a leading American poultry journal and acknowledged authority on matters pertaining to this department of the farm, says: The supposition that limed eggs keep down prices is incorrect. They do not in any manner compete with what are termed "strictly fresh eggs," but are used for other purposes, such as in photography, in bakeries and for coloring in certain purposes. The prices for fresh eggs have been high enough in the winter to suit all who keep poultry, and thousands of tons of limed eggs have no more effect on the price of choice eggs than would so many small stones.

A new article of commerce is exported for the first time this month from Italy that promises to command a very large sale. It is called "gelsoline" and is produced from the fibrous bark of the mulberry tree. In strength it is said to be very much stronger than the American cotton, and its cost is much less.