Elementary Anatomy,

AS APPLIED TO NURSING.

By Bedford Fenwick, M.D., M.R.C.P.,
Physician to The Hospital for Women.

LECTURE II.

(Continued from page 108.)

With regard to muscular contraction, it will not be out of place, now, to mention a fact upon which we must lay greater stress hereafter, that the muscles of the intestine are arranged in two layers, one set of fibres being parallel with the length of the intestine, while another set are disposed circularly around the gut at right angles to the former layer of muscles. The object of this arrangement is very plain, because the contraction of the longitudinal fibres will draw up the intestine, while the circular fibres simply contract its calibre, and, under the influence of the combined movement, the contents of the intestine are, therefore, pushed and drawn along the canal. We shall also find that this action of the muscles in the intestine takes place, so to speak, in waves, the contraction commencing at the upper part of the stomach and gradually passing along the whole course of the intestines. You will see the great importance of this *peristaltic* action, as it is termed, when we come to consider the various diseases by which the intestines are liable to be affected.

To come now to the injuries to which muscles are liable. The most important, because the most frequent, is that which is known as a *Strain*, and which is caused by accidents which there is no need to particularize, because most people have unfortunately had practical experience of these, and the results upon themselves. The consequence, however, of a strain is a sudden stretching of the muscle tissue, and, probably, the rupture of a few of its fibres, from the torn ends of which more or less blood exudes; and so we find that there is pain upon movement, and some amount of swelling. Familiar examples of these accidents are, nowadays, termed the "tennis arm," or the "rink leg," and are simply muscle strains. As can well be imagined, there is not only the immediate pain but considerable suffering exists for some time afterwards. At the time of the accident, nature calls for rest to repair the broken fibres and to permit the extravasated blood to be absorbed. Consequently, the treatment will consist, at first, of complete rest, with the application of cold or hot lotions as the doctor may deem best for the particular case, and afterwards of friction with stimulating liniments and massage of the affected muscles.

From the subject of the muscles of the body we pass by a natural gradation to consider the tissues by means of which the muscles are made to work. In every muscle both voluntary and involuntary contraction depends upon the influence of the nervous system, that is to say upon the commands conveyed to the muscle either to contract or relax by means of the nerves which are distributed amongst the fibres of that muscle. We therefore find that there are two well marked classes of nerves, the *motor* nerves or those by whose influence muscular movement takes place; and *sensory* nerves or those which convey impressions from the outside to the central nervous organs, that is to say, the brain and spinal cord. Every nerve in the body is connected directly with these central organs, exactly as the telegraphic wires of our streets are connected with a recording instrument at some central office. It will, probably, simplify the description and understanding of the nervous system if we somewhat enlarge the analogy between the telegraphic system and the nervous system of the human body; regarding, for the moment, a machine manipulated at the central post office of a town, as the brain and spinal cord, and the telegraphic wires extending to and from a distant branch office as the nerves which branch out from the cord to and from the extremity of a limb in the human body. We need not discuss the changes which take place in the electric wire, nor in the nerve tissue; the one thing needful to remember being that in both cases impressions are conveyed through both media with practically instantaneous rapidity. We will imagine then, for the sake of an example, that we have two wires running between two telegraph offices *a* and *b*, of which we will also take the former to represent the brain, and the latter the end of the little finger of one hand; a message is handed in at *b*, telegraphed to *a*, and an immediate answer sent back to *b*. So if a pin suddenly and unexpectedly prick the little finger, the feeling is through the sensory nerves immediately conveyed to the brain, and instantaneously a message is sent back to the muscles of the hand, those of the forearm, and even those of the arm, and the finger is instinctively and instantly withdrawn from the injurious contact. Simple as this instance may seem, it involves a very complicated and important series of movements, the muscles which are thrown into action in order to withdraw the finger from the pin are supplied by separate nerves, which obtain, therefore, independent messages from the brain, and the general movement which results from all this combined nerve-muscular-action is an excellent example of what you will hear termed in medical wards, co-ordination. In disease of the nervous system, we shall find that this want of co-ordinated movement amongst a number of associated muscles is impaired or altogether lost, and you will easily understand from the simple description which I have given, that this must occur in consequence of some interference with the passage of the necessary nerve messages.

previous page next page