

## A GUIDE TO MEDICAL AND SURGICAL NURSING.\*

### CHAPTER XII.—THE NERVOUS SYSTEM.

**W**HETHER your work lies in Medical or Surgical Nursing, you will hear constant reference made to the nervous system; and the more you read about its functions, the more you will be struck by the wonderful results which are achieved by the nerve centres and nerve cords, which have been often compared to a set of telegraph wires between the galvanic centre and the various distant points to which they are distributed.

The nerve centres, as they are called, where the mysterious nerve force—of the nature of which the wisest know but little—is generated, are composed of greyish cells, and the nerve tubes or fibres contain a whitish matter, and are packed in bundles for convenience of distribution to all parts of the body, though each runs its course separately from beginning to end. The nervous system has to do with sensation, muscular motion, the various functions connected with the nutrition of the frame, and all the manifold workings of the brain. The nerve centres are divided anatomically into two divisions, cerebro-spinal and sympathetic.

The cerebro-spinal system consists of the brain, the spinal cord, and the nerves which proceed from them. As you know, the brain is contained in the skull, and the shape of one is moulded to the other. The spinal cord, which is contained in the spinal canal, finds its way into the brain through a large hole in the occipital bone, and is also covered by *dura mater*, which lines the bones of the skull. Both brain and spinal cord are covered by a delicate membrane called *pia mater*, which goes in between the convolutions of the brain. Outside this is a double layer of a serous membrane called the *arachnoid*, and over this again is a thicker fibrous membrane called *dura mater*, which also separates the various parts of the brain from one another. The upper portion of the spinal cord is called the *medulla oblongata*, and is specially connected with the act of breathing. Any injury to this has always a fatal result.

The brain, as well as the spinal cord, is divided down the middle, and there is a special supply of nerve force for each side of the head, body, and limbs. The two hemispheres, as they are called, of the brain are connected by fibrous nerve bands, some of which are named commissures. The brain is also divided into a larger and smaller portion called the cerebrum or larger brain, and the

cerebellum or smaller brain. It is the large size of the cerebral hemispheres in man which distinguish his brain from that of an animal, and it is supposed that there is an association between the higher faculties of the mind as well as the emotions, and the great cerebral mass which fills the upper part of the skull. You will doubtless have an opportunity of seeing that not only in idiocy is there generally a defective development of this part of the brain, but also that any pressure, either through disease or injury, upon it, may alter or destroy all power of the intellect.

The nerve cords, derived from the *cerebro-spinal* centre, are distributed throughout the body, often accompanying the large blood vessels, especially in the limbs. Some of these fibres or conductors convey impressions towards the centre, as those of sensation, and others impulses *from* it, as those of motion; the former are called afferent fibres, the latter efferent. These nerve fibres may be also stimulated into action artificially; thus, an electric current transmitted along a motor or efferent nerve, or even pinching it, produces contraction of the muscles it supplies, and mechanical imitation of a sensitive nerve causes pain. Use is sometimes made of this knowledge in stimulating the motor nerves of a paralysed limb by magnetism. When any part of the body is touched we know at once the exact spot; and this is probably due in a measure to habit and education. At any rate, when a piece of skin is partially raised and turned round, as is sometimes done in surgery, to fill a gap made by injury, a considerable time elapses before the patient identifies its new position; and those who have recently suffered amputation constantly complain of pain in the toes or fingers, which is explained by the irritation of the cut ends of the nerve fibres that supplied these parts.

Some nerves spring in pairs from the under part of the brain and medulla oblongata, and there are thirty-one pairs of spinal nerves, which all have double roots, and escape from the spinal canal by the several holes in it and the sacral canal.

The sympathetic much resembles the cerebro-spinal system, but the centres or sources of nerve power are scattered instead of being all together.

There is another important function of which the spinal cord is shown to be the special seat, that of receiving impressions, and communicating impulses quite independently of the will and even, it may be, the knowledge of the individual.

This system, therefore, implies the presence of a centre of nerve power, and of afferent and efferent nerves, conveying impressions between such centre and the muscles influenced by it. This *reflex action*, as it is called, may occur without

\* These articles are partially from the pen of the late Miss Alice Fisher and Mrs. Norris, and will eventually be published in book form, being revised by the latter.

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