

As regards the temperature in the limbs there is another distinguishing feature. You will find that the limbs are very much warmer where the muscles are paralyzed, and lessened in warmth upon the opposite side. There is then a double effect upon the temperature; increase upon the side of the lesion, and diminution upon the opposite side. But these are not the most interesting features of such cases. You will find that the face is warmer upon the side of the lesion, and that is because the fibres of the sympathetic nerves going to the blood-vessels of the head are divided upon that side of the spinal cord. There is higher temperature in the face, higher sensibility, and greater redness of the eye and ear. There is also a symptom to be observed in the eye; and that is dilatation of the pupil upon the side of the lesion. These are effects which we know will follow galvanizing the sympathetic in the neck. All these effects are found in connection with disease of one-half of the spinal cord.

The fact that the muscles are contracted is in consequence of the greater afflux of blood to the part; it is not due to changes occurring in the nerve centres, but to the local fact of being fed far more abundantly than in health. Hence they are in a state of greater tonic, as it were; but there is no trace of paralysis on either side of the face. That fact will serve as a diagnostic feature between the form of hemiplegia depending upon disease of one-half of the spinal cord, and hemiplegia depending upon disease in the base of the brain. Besides there are a great many symptoms of disease in the base of the brain which do not exist with disease affecting one-half of the spinal cord.

I now pass to other facts. In cases of disease of one-half of the spinal cord, you will find that there is usually a feeling of stricture about one-half of the body at a level with the seat of the cord.

ZONE OF ANÆSTHESIA.

At that place there is something that can be recognized which is very interesting indeed, and which is in harmony with the view regarding the origin of nerve-fibres. As the lesion in the spinal cord necessarily destroys some nerve-fibres which do not supply the motor-trunk, there is a zone of paralysis of sensibility at the level of the injury in the cord. Some of the sensory roots are involved; hence the loss of sensibility in that circumscribed region. We have hyperæsthesia below and above the seat of the lesion, and a small zone of anæsthesia at a place where the lesion occurs, so that the body is separated into three zones—two of hyperæsthesia and one of anæsthesia. Nothing of this kind is present in hemiplegia depending upon disease in the base of the brain. You can already see that diagnosis can be easily established, and you will see this much more clearly as I come to speak of the symptoms of hemiplegia depending either

upon disease of the medulla oblongata, or other parts of the brain.

GENERAL SYMPTOMS.

When there is disease in the medulla oblongata, or pons varolii, there are general symptoms which are of great interest, not so much for diagnosis, as for prognosis. They are important in deciding upon the chances for restoration to health, and the chances of death; and also the means of treatment are not the same as when the disease exists in other parts of the brain. These general features are that, according to the seat of the disease in the base of the brain, there are nerves implicated which show where the disease exists. Supposing it to be in almost the entire length of the base of the brain, from the origin of the optic bands down to the spinal cord, you will find that all the nerves which take their origin in that part are more or less implicated in the disease. If you know what these nerves are, you can easily understand what the symptoms will be. I will simply mention that as the *third* pair of nerves is implicated, certain results will be manifest in the eye, and you will find the pupil affected, and the motion of the eye will be affected. Other nerves are implicated, and the effects are exceedingly complex, but they are in perfect harmony with the known functions of the nerves, having their origin at the base of the brain. So the diagnosis may be perfectly clear, and you will find as a rule, that the paralysis, instead of being upon the same side, as in the case of disease of one-half of the spinal cord, is upon the opposite side of the body. If there is loss of feeling, it is where the loss of movement exists.

DISORDERS IN THE KIDNEYS, LUNGS, AND HEART, ETC.

But there are other features: there are disorders which take place in many of the organs of the body. The urinary secretion is disturbed; sometimes increased immensely, with or without the presence of sugar. When sugar is present, the quantity of urine is not so much increased as when the sugar is absent; but it may be considerably increased in quantity. We may have them in both forms of diabetes—insipidus and mellitus. These two forms of diabetes are found in connection with all diseases in the base of the brain, but they may exist in connection with disease very far from the brain. To my knowledge, these forms of diabetes never exist when the spinal cord is the seat of disease.

There are many other features. I have shown that lesions of the pons varolii, or medulla oblongata, affect the lungs almost at once. That is the fact in most cases in which the lesion is made in animals. I may say that it is frequently so in man.