

One of the chief effects produced by lesion in the pons varolii in man is considerable congestion of the lungs. Another effect, which depends almost only upon lesion in the pons varolii where the crus cerebri comes into it, is hemorrhage into the lungs. This occurs very frequently indeed; sometimes it is slight, and sometimes enough to destroy life rapidly. It was known that hemorrhage into the lungs occurred in connection with hemorrhage into the base of the brain, but it had been supposed that it took place because of the same alteration in the walls of the blood-vessels in the lungs as was present in the blood-vessels in the brain. My friend Professor Charcot and Bouillaud made the great discovery that hemorrhage in the brain depended almost always upon the rupture of small aneurisms—miliary aneurisms. It was imagined, and it has been found to be the case, that the blood-vessels in the lungs also have the same kind of aneurismal dilatations, and it was thought that in those cases in which hemorrhage, either small or large, took place in the lungs, after having hemorrhage into the brain, it was dependent upon the same cause. Without doubt it is so in some cases, but, as a rule, when the hemorrhage in the lungs appears very quickly after that which occurs in the brain, it is produced in a direct manner by an alteration in the circulation in the lungs.

I have asserted that the breaking of blood-vessels in the lungs depends upon this change. The arteries and veins become so contracted that there is not a trace of blood in them, and then the congestion goes so far that a capillary breaks, and there is hemorrhage. It is one of the causes of death in disease in the pons varolii, or perhaps at other parts of the base of the brain.

This cause of death has not been sufficiently guarded against, and it very frequently happens that no examination of the chest is made in these cases. This is a fault which I myself have fallen into, but it should always be kept in mind that great alteration can take place in the lungs in consequence of disease in the base of the brain.

The opposite may occur, perhaps, in one out of ten cases.

We have, then, *first*, congestion of the lungs, and, after a time, there may occur, foci of inflammation in connection with acute disease in the base of the brain. As the patient has more or less difficulty of breathing, on account of the brain disease itself, the disease of the lungs passes unnoticed, and no local treatment is applied which could be of great service to the patient. I have no doubt that we may recall to memory a great many cases published as fatal cases of disease, occurring at the base of the brain, which terminated fatally, not because of the brain disease itself but because of subsequent disease of the lungs, which passed unnoticed during life.

There is, therefore, in cases of disease of the

brain, an effect, which is of great importance, produced upon the lungs. Another effect which is of great interest can take place. As you well know, the par vagum takes its origin in the medulla oblongata. And you know that if this nerve is galvanized, the heart's action is arrested. Well, acute disease in the medulla oblongata, or close to it in the pons varolii, will produce irritation of the par vagum, and may reduce the heart's action to such an extent as to prove fatal. You doubtless know that there are a number of cases upon record in which death was caused by pressure upon the medulla oblongata, from displacement of bones, or some other cause. There is this feature, then, in connection with disease in that region: that is, there is a diminution in the beat of the heart—a diminution in force rather than a diminution in speed.

There are other features belonging to lesion in those parts. As you well know, the œsophagus, the pharynx, and the larynx are supplied with nerves which arise from this region. There may be spasm in these organs. In a case which I shall always remember, for it occurred in the person of a most dear friend of mine, there was such a spasm in the œsophagus that it was absolutely impossible to feed him by the mouth; not even a tube could be passed through the œsophagus, so great was the spasm, and we were obliged to sustain his life by nutritious injections into the bowels. The material used was the fresh pancreas of an animal, with hashed meat. The fat is removed from a fresh pancreas, and the influence of the remaining portion upon nutrition is pretty nearly the same as if a series of meals were taken in the usual manner. In the case of my poor friend, life was maintained eight days solely by this process of eating.

There is, therefore, an effect produced upon these parts by disease situated at the base of the brain, as mentioned. There are other features of interest. You may diagnose very easily, for instance, whether there is disease present upon the origin of the trigeminal nerve by change in the state of the cornea. The cornea becomes somewhat inflamed and after a time the eye may be destroyed. You already know that Magendie has long ago shown that when the trigeminal is divided in an animal there will follow impairment of nutrition in the eye, and after a time the organ will be lost. Magendie also has shown that all the senses are affected by division of the trigeminal—the sense of sight, of audition, of olfaction, as well as the sense of taste. This conclusion of Magendie would not have been drawn had he been familiar with the phenomenon of the loss of function. When the trigeminal is diseased or divided, the nerve-fibres produce no action, and that result is quite sufficient to produce loss of sensation, and the nutrition of other organs of sense is disturbed by such result.

A blow upon the frontal nerve, for instance, may