once observed. In addition to the muscular paralysis, which may enable the surgeon to localize the spot at which there is pressure upon the brain, there is the grave symptom of coma or insensibility. And, as in deep sleep, there is often loud snoring, due to the vibration of the paralysed soft-palate. The heart being loaded with imperfectly aerated blood, the face is dusky or livid, and the pulse is slow and full. No notice is taken by the man of a loud shout into his ear, and on the surgeon raising his eyelids the pupils are found dilated and fixed, which signifies that the reflex to light is lost—a very grave sign. There may be complete paralysis of one side or of both sides of the body. Not only may the pressure of a blood-clot, an abscess, a foreign body (such as a bullet) or a depressed piece of the skull­wall give rise to coma, but so may a syphilitic, a malignant or an innocent tumour, and in cases in which the administration of iodide of potassium fails to afford relief, the operation of trephining may perhaps be resorted to, as giving the only chance of recovery. As regards treatment—short of trephining—it may be advisable to relieve the heart by bleeding. Inasmuch as the reflex actions are in abeyance, it will be necessary to have the bladder regularly emptied. The man should be placed on his side in bed, so that his tongue may not fall back and choke him, and if it is thought inadvisable to bleed him, a full dose of calomel should be administered.

For the operation of trephining, the head is shaved and the skin rendered aseptic, a large horse-shoe flap is then turned down and the skull laid bare. With an instrument on the principle of a centre-bit, a disk of bone of the size of a florin, a crown or a napkin-ring—or even larger—is then taken out of the skull wall, and the dura mater is opened up if the cause of the compres­sion is beneath it; otherwise, on the disk of bone being removed, the particular condition is dealt with without opening the dura mater. When the clot or the tumour, or whatever it is, has been removed, the disk of bone which, during the operation, has been kept in a warm liquid, is cut up into pieces which are put back into the opening and the skull flap is brought up into its proper position.

Fractures of the base of the skull are always serious, in that they may run across important nerves and large blood-vessels; passing through the roof of the nose, or the ear, they may be compound—that is to say, they may communicate with air­cavities from which pathogenic germs may readily enter the injured tissues. Thus, the dangers of sepsis are added to those of concussion or compression of the brain. Fractures of the base of the skull are often associated with bleeding from the nose, mouth or ear, or with extravasation of blood over the eyeball. Facial paralysis is the result of the line of fracture passing across the bony channel in which the seventh or facial nerve is running. When the fracture passes across the temporal bone and the middle ear, and ruptures the membrane of the tympanum, not only blood may escape from the ear, but an apparently unlimited amount of cerebro-spinal fluid. In all cases the ear should be made surgically clean, and watch and guard kept against the entrance of septic micro-organisms. When the fracture extends through the anterior part of the base of the skull this same clear fluid may escape from the nose. In both cases its appearance implies that the dura mater has been lacerated and the sub-dural space opened.

Concussion of the brain (stunning) may result from a blow upon the head or from a fall from a height. The symptoms may be those of a mere giddiness, and a feeling of stupidity, which may quickly pass off, or they may be those of severe shock (see Shock) . The person may die from the concussion, or he may slowly or quickly recover. The insensibility may be for a time complete. The pulse may be small, quick and imperceptible, and, no blood being pumped up by the enfeebled heart, the face will be pale and the surface of the body cold. The respiratory move­ments are likely to be sighing and shallow, or scarcely perceptible. As a rule, the pupils react to light, contracting as the lids are raised. This shows that the light-reflex is not lost, and is a good omen. One of the first signs of returning consciousness is that the person vomits, and after this he gradually comes round. As a result of the injury, however, he may remain irritable, and liable to severe headaches or to lapses of memory.

*Surgery of the Brain,—*Abscess of the brain is most likely to be the result of extension inwards of septic inflammation from the middle ear, or of a fracture of the skull which passes across the aural, nasal or pharyngeal air-space, giving the opportunity for the entrance of the germs of suppuration. As the collection of pus forms, persistent headache is complained of together with, perhaps, localized pain or tenderness. A constant feature of intra-cranial pressure, whether the result of tumour or of abscess, is the presence of headache and of vomiting. Later the patient becomes drowsy. On looking into the back of the eyeball by the ophthalmoscope, it is noticed that the optic nerve is congested (“choked”), the result of the increased intra-cranial pressure. The pulse becomes strangely slow, and is apt to drop a beat now and then. The temperature is high. The patient may have attacks of giddiness, and he is subject to fits of an epileptic nature; growing steadily worse, he may be found paralysed on one side, or on both sides, and, becoming insensible, may pass away in the deep sleep known as coma.

The symptoms of tumour of the brain are much like those of abscess, though they come on more slowly and steadily; and inasmuch as the disease is not septic, the temperature may be undisturbed, or but little raised above normal. In the case of the abscess or the tumour being on the left side of the brain, and involving the speech centre (Broca’s convolution), the patient becomes aphasic.

Tumours of the brain are likely to be sarcomatous (see Cancer) , but they may occur as the result of tuberculous or syphilitic deposit, or of infection by the ova of the dog’s tape-worm— hydatid cyst.

In cases of suspected cerebral tumours in which there is even a bare possibility of the patient having been the subject of syphilis, iodide of potassium is prescribed in large doses. Indeed, whilst waiting the development of further symptoms in any obscure case, it is usual to try the effect of this drug, the good influence of which is by no means confined to cases of syphilis. If in spite of the administration of the iodide the symptoms are increasing, the question of opening the skull and exploring the region may arise. Before the days of anaesthetics and of anti­septics such a procedure could scarcely have been considered, but now the operation can be undertaken in suitable cases with a good hope of success.

If the case be one of abscess secondary to disease of the middle ear, the skull will probably be opened in the continuation of the operation by which the septic disease in the temporal bone was cleared away, the aperture having been enlarged by the use of the trephine, gouge or chisel. The side of the head is shaved and rendered aseptic before the operation is begun, and when the dura mater has been incised search is made for pus by the use of a grooved director. Pus having been found, the cavity is treated by gentle irrigation and drainage. When the operation is undertaken for a cerebral tumour the whole of the head is shaved and the skin duly prepared, so that the operation may be carried out with the least possible risk of the occurrence of sepsis. A large horse-shoe incision having been made, the flap of skin and muscle is turned down, and a disk of the skull-wall, about 2 in. in diameter, is removed by a trephine, worked by electricity or by the hand. The thick covering of the brain, the dura mater, is thus exposed, and if the presence of a tumour (or an abscess) has caused an excess of intra-cranial pressure, the membrane will bulge into the opening. The dura mater is then incised and turned down, and if the tumour is upon the cortex of the brain, and not too extensive, it is taken away. It may be necessary, however, to enlarge the opening made in the skull, and to break through a considerable mass of brain-tissue before the tumour can be removed. Bleeding having been arrested by pressure with a firm plug of gauze, a soft drainage tube is introduced and the dura mater is stitched in position. The disk of bone (which, since its removal, has been kept in some salted warm water) may be replaced before the horse-shoe flap is stitched in position, a notch having been cut in its border to allow for the drainage. In some