

Still irritable. Pulse 102, temperature 101° F. Eye dressed and looking well. Face much swollen. Third day: Pulse 95, temperature 100·6°. Irritable and refused aperient. About a teaspoonful of thin fluid escaped from puncture on brow when dressing was taken off. Fourth day: Took calomel, but refused mag. sulph. later. No movement of bowels. Lies with head covered and on right side. Sent to base on fifth day. There was evidently a good deal of cerebral irritation, and he will probably not do very well.

CASE 8.—Lieutenant —, admitted 12 P.M. in fair condition, drowsy but conscious. Gunshot wound forehead. Entrance wound small, 1 inch above root of nose. Exit wound right side above attachment of ear. Right eye destroyed and soft. Angular incision made excising wound and running along supra-orbital ridge to external angular process of frontal bone. Whole upper wall of orbit detached downward and almost loose. Pieces of bone removed. Eye excised and rubber dam drain at external end of skin wound. Wound above ear excised. There was much laceration of right frontal lobe. Second day: Conscious. Pulse 88, temperature 99·6° F. Complains of headache. Eye dressed. Wound in forehead clean. Sent to base sixth day, conscious and feeling pretty fit.

CASE 9.—Sergeant —, admitted 2 A.M. unconscious, cold, and very collapsed. Wound over vertex, half an inch to right of middle line and over the parieto-occipital fissure. Bandages very blood-stained. Dressed and kept warm. 4.30 A.M. operation. Wound excised and extended transversely across scalp both ways. Large hole  $\frac{1}{2}$  inch by  $\frac{3}{4}$  inch close to the longitudinal interparietal suture passing inwards to left. Trephine opening made to right of wound. Depressed bony splinters removed. One large piece was sticking into longitudinal sinus and its removal was followed by free and persistent bleeding. Plugged with gauze, and wound closed over a piece of rubber dam covering the outer side of gauze. Several other wounds of right side and back, one large of right shoulder dressed. Patient very bad at end of operation. Same evening, pulse 70, fairly strong, temperature 101·4°, respirations 30 and stertorous. Fairly conscious. Second day: Still much the same. Head wound not dressed but other wounds dressed and looking fairly clean. Pulse 90, temperature 100·5°, respirations 26, and quiet. Taken some nourishment. Third day: Gauze plug removed. No bleeding. Wound dressed. Pulse 86, temperature 101° in evening. Conscious and looking well. Was sent to base on fifth day.

This is the only case where the longitudinal sinus has been badly torn, but in several cases there has been free bleeding suggesting injury to lateral and occipital sinuses. All cases have been plugged with dry sterile gauze which has been left in for 48 hours.

#### Summary.

1. All scalp wounds should be completely excised as early as possible.
2. Where cranium has been injured or there are cerebral symptoms suggesting intracranial pressure the trephine should be used and the dura opened if necessary.
3. Drains into the brain tissue are useless in early wounds and are probably detrimental to brain tissue.
4. No probing of any kind should be done in absence of a radiogram showing missile.
5. Early movement of cases of head injury in motor ambulances causes considerable shock to lying or stretcher cases.
6. The mortality in cases reaching a casualty clearing station 15 to 20 miles behind the firing line will be about 1 in 10 if every case not moribund is operated on for urgent symptoms only.
7. All pieces of shell and bullets sooner or later cause brain trouble, and should be removed in specially equipped hospitals.

**NOTIFICATION OF INFECTIOUS DISEASE: THE PROPOSED REDUCTION OF FEE.**—At a meeting of the medical men of Gorton, Manchester, the proposal by the Local Government Board to reduce the fee for the notification of infectious diseases was discussed and the opinion strongly expressed that such parsimonious action was dishonourable and ungrateful, particularly at the present time, when extra and heavy calls have been made upon the medical profession for voluntary and charitable work, such as attending the wives and children of soldiers and sailors, signing many thousands of certificates per week for those unable to attend at the post-office to draw their weekly pay. The heavy work of attending to the private and panel patients of those doctors who are serving in the forces, the increase in the price of drugs and chemicals, and the enhanced cost of professional living made the action of the Local Government Board, it was held, very wrong.

## TWO CASES IN WHICH THE LATERAL VENTRICLE WAS OPENED

IN THE COURSE OF OPERATIONS FOR THE REMOVAL OF A BULLET AND INDRIVEN BONE FROM THE BRAIN.

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THE extreme fatality that follows the opening of a lateral ventricle during an operation for the removal of a foreign body, whether a bullet, shell fragment, or depressed bone, makes perhaps this record of two cases in which recovery followed the operation justifiable.

In about 200 cases that have come under my notice there have been some half-dozen cases where after the removal of the foreign body cerebro-spinal fluid has been found escaping from the depth of the wound, either at the operation or during the dressings some little time after the operation. In these cases the marked infection present had compelled an operation to be undertaken, although X rays showed the likelihood of the ventricle being involved, and, further, this marked infection had reluctantly compelled one to leave in a drain. These patients mostly died from cerebral hernia following infection of the ventricle and basal meningitis, but one died from extreme emaciation and wasting due directly to the persistent escape of cerebro-spinal fluid from a fistula that connected the lateral ventricle with the scalp wound. In view of this high mortality I ventured in the following two cases to depart from the general rule in early cases of always draining the track after the operation for the removal of foreign bodies or depressed skull fragments which were embedded in the brain. In these two cases the signs of sepsis were absent or slight, and so I felt justified in taking the risk of leaving a possibly infected track of the brain undrained to the risk of establishing a cerebro-spinal fistula. Fortunately, this procedure was justified, and either the wound was not infected or probably the patient's tissues were able to overcome the infection that was there. Unfortunately, in the vast bulk of wounds of the head where missiles or fragments of bone are embedded in the brain marked sepsis is only too obviously present, and a fatal result is very likely to follow when the ventricle is unavoidably laid open at the operation. Both the cases occurred at a base hospital in France, where the head cases were usually very severe and the wounds heavily infected.

CASE 1.—The patient was admitted to hospital on August 28th, 1915. No history was obtainable. There was a small penetrating wound 2 inches behind and 1 inch above tip of the right pinna. Temperature 97° F., pulse 56. The patient was restless and would not speak, his face was congested, and the respirations were slow and shallow. He was able to move. There was no paralysis of face, limbs, or tongue, and the reflexes were normal except for a diminished abdominal reflex and a doubtful Babinski. X ray examination showed a rifle bullet embedded in the brain opposite the wound, and this was localised to be with its point at about the middle line. On the 31st the patient was worse. There was more unconsciousness; the pulse-rate was 50 and the temperature was 97°; and the breathing was stertorous. Operation was decided upon.

*Operation.*—A large scalp flap was turned down and a small hole in the skull was exposed. A small trephine hole was made in the skull, and the bone round the wound was removed with the forceps. A small opening, too small to take the little finger, was found in the dura, and the brain beneath the dura was felt to be under extremely high tension. The bullet could be felt with a probe at a depth of 6·5 cm. The cerebral tension was relieved by lumbar puncture which showed the cerebro-spinal fluid to be blood-stained. After slightly enlarging the opening in the dura the end of the bullet was grasped by a pair of forceps and the bullet was removed. A gush of cerebro-spinal fluid and disintegrated brain matter now escaped from the wound in the brain, and the fluid continued trickling away during the rest of the operation. The tension of the brain fell markedly. The wound in the scalp was floored by a flap cut from the pericranium and the scalp flap was sutured. No drain was left in. On Sept. 1st the temperature was normal. The patient was more conscious, there was no draining of fluid from wound, and no bulging of the flap. Lumbar puncture was performed, and 10 c.c. of blood-stained fluid were withdrawn. Headache was present.

On the 3rd the patient was more conscious and had commenced to speak, and the headache was less. There was a boggy swelling of the side of the scalp under the flap, and this swelling extended to the side of the face. The eyelids were markedly oedematous and almost transparent from the fluid in them. Temperature normal. The fluid was thought to be of cerebro-spinal origin, which had escaped from the lateral ventricle along the bullet track and was collecting in the tissues of the scalp and the face. There was no escape from the bullet or operation wounds. This swelling gradually subsided, having lasted for about a week. On the 11th the patient was quite bright. The pulse-rate was 80 and the temperature was normal. There was no weakness, and except for some slight affection of speech the patient seemed quite well. He was sent home to England about a week later and his condition appeared to be normal save for the slight affection of the higher speech centres.

CASE 2.—The patient was admitted to hospital on Oct. 24th, 1915. He had been wounded by a rifle bullet, the entrance wound being 3 inches above the nasion and 1½ inches to the right of the mid-line and the exit wound 2 inches behind the entrance wound and 3 inches to the right of the mid-line. The patient's mental condition was normal, as also were the cranial nerves and the motor system. The left abdominal reflex was greater than the right, and the knee-jerks and ankle-jerks were increased. Double Babinski was present. Temperature 98° F.; pulse-rate 64. An X ray examination showed a defect in the skull situated between the two wounds and several large pieces of bone imbedded in the brain at a depth of from 3 to 4 cm. below the defect in the skull.

Operation.—On the 26th a large scalp flap was turned down, and disintegrated brain matter was seen to be escaping from the defect in the skull. A small trephine opening was made and the bone was removed around the dural defect. A large cavity was found in the brain filled with disintegrated brain matter and containing several large pieces of bone at its bottom. These were gently removed, but cerebro-spinal fluid was seen to be escaping from the bottom of the cavity in the brain. The wound in the scalp did not appear to be grossly infected; it was floored in by a pericranial flap and the scalp was sutured in place. No drain was used. The patient was put on urotropine. On the 27th the temperature was 99.5° F., and the pulse-rate 60. There was some headache. The patient got out of bed, but he seemed rational. 28th: Temperature 100°; pulse-rate 66. More headache. Lumbar puncture showed slightly increased pressure. 29th: Temperature 101.8°; pulse-rate 78. Headache; patient irrational; marked bulging of flap and some oedema. A needle was put in under the flap but nothing was drawn off. 30th: Temperature 100°; pulse-rate 70. Patient quieter; flap bulging less. Nov. 2nd: Temperature 98.9°; pulse 76. Bulging of flap gone; patient usually quiet but at times delusional. He stated that his sister had visited him, but such was not the case. Some headache; passed his urine in bed at times. 3rd: Better; quite bright mentally; no incontinence; wound healed by first intention; no bulging; power normal; knee-jerks normal; no Babinski. Some loss of sensation to pain on left side. On the 16th the patient was transferred to England. Condition the same.

In the first of these cases it is quite likely that the wound was clean, or only very slightly infected, the marked increase in intracranial pressure being due to oedema following the trauma, although the patient appeared to be likely to die from it. This was very markedly relieved after the bullet was withdrawn and the ventricular fluid allowed to escape. The track evidently kept open for some time, as was shown by the accumulation of fluid under the scalp, and it is probable that this kept down the intracranial pressure.

In the second case a certain degree of infection was, I think, present. This is shown by the rise of temperature and the bulging of the flap. Whether this bulging was due to escape of fluid or to bulging of the brain is not certain, but probably to both, as there was some oedema, but nothing like to the same extent as in the former case. Fortunately the patient was able to overcome this infection after the removal of the bone. It is possible that he might have done so if he had been left without operation, but experience has shown this to be more dangerous than operative treatment. In the early stages of the war cases were seen in which patients with indriven fragments of skull were left alone on account of the complete absence of symptoms and rise of temperature, yet almost invariably they developed abscesses around the fragments. Still, it must be admitted that an occasional patient apparently recovers with an inaccessible foreign body in his brain.

## THE TREATMENT OF HEPATIC FAILURE IN YELLOW FEVER, MALARIA, AND OTHER CONDITIONS: A SUGGESTION.

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IN THE LANCET of Nov. 21st, 1903, I described a case of multiple liver abscess which terminated fatally. At the time I thought that death was due to shock, but I was puzzled by the symptoms, which were peculiar and suggested some failure of the emunctories. Months afterwards Mr. Harold Stiles, of Edinburgh, informed me that, having read the account of the case, he had no doubt that death was in reality due to delayed chloroform poisoning, a condition which at that time was scarcely recognised. I know now that Mr. Stiles was correct, and I am convinced that symptoms similar to those present in delayed chloroform poisoning may occur in tropical diseases where the liver, so to speak, is thrown out of action, where it fails to perform its functions, and where, as a result, the patient is in imminent peril of his life. A study of tropical pathology has led me to the conclusion that sufficient stress has not been laid on this hepatic failure, at least so far as remedial measures are concerned. Recently, as a member of the Yellow Fever Commission, I have had my attention closely directed to the state of the liver in yellow fever. Recently, also, I have been brought directly or indirectly into contact with cases of so-called "infectious jaundice," and I have been privileged to hear my colleague, Colonel William Hunter, A.M.S., expound his views on the pathology and treatment of this and allied conditions. I have also had opportunities, at Panama and elsewhere, of studying sections of the liver from cases of yellow fever, toxic jaundice, blackwater fever, and malaria associated with icterus, and of noting the marked destruction of liver cells which occurs in those diseases. These studies have brought to my mind a case of malarial infection in the Sudan where, although quinine eventually cleared the blood from a heavy infection of *P. falciparum*, death occurred after a peculiar set of cerebral symptoms. At the time the medical officers in attendance on the case felt themselves between the devil and the deep sea, for they had difficulty in deciding whether these symptoms were due to the action of malarial toxins or were evidence of a tendency to quinine poisoning in a subject very susceptible to the effects of the drug.

In the light of recent work and remembering the condition of the liver as revealed post mortem, I have no hesitation in saying that the symptoms in this case also were an expression of hepatic failure.

Now what are the symptoms associated with the destruction of liver cells? They are chiefly of cerebral origin, pointing to a poisoning of the higher nerve centres. The patient begins to grow restless, watchful, excited, anxious, and light-headed. He complains of severe headache and, it may be, of photophobia. He wanders in his mind and suffers from an incoherency of ideas and from hallucinations. His muscles twitch and tremble and delirium ensues. It may be of a low, muttering type, or may become active, the patient trying to get out of bed, but it is not usually very violent, for there is great weakness. Convulsions may set in, and if cardiac or respiratory failure does not occur coma ends the scene. In addition, we find that if jaundice is already present it deepens, while hiccough, clammy sweats, and anuria are not infrequent.

It will be found that these symptoms are common to delayed chloroform poisoning, yellow fever, severe cases of epidemic jaundice, the so-called Mediterranean yellow fever, Weil's disease, whatever that may be,<sup>1</sup> blackwater fever, certain forms of fatal malaria, acute yellow atrophy, phosphorus poisoning, &c.

All this is well known, but confining ourselves to the tropical diseases, it would seem that these symptoms have

<sup>1</sup> Recent Japanese work goes to show that Weil's disease is due to a spirochætal infection (Journ. Exp. Med., March, 1916).