suffered from any attacks of numbness or pain, and except for the local condition, is in robust health. A brother of his has been examined by me, and is quite free from any pigmentation or molluscous growth.

As regards treatment of the affection, Zum Busch considers arsenic by injection, or in Fowler's solution, to be the only useful drug.

I am greatly indebted to Major E. Jennings, I.M.S., and Major G. J. Buchanan, R.A.M.C., for the photographs illustrating the cases.

A CASE OF FRACTURE OF THE BASE OF THE SKULL FOLLOWED BY EPILEPSY, NOT OF THE JACKSONIAN TYPE.

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Perhaps some points in the following case may be considered of interest. For permission to use the notes I am indebted to the courtesy of Mr. Anthony Bowlby, C.M.G., in whose wards at St. Bartholomew's I saw the case.

On February 17th, 1904, A. B., aged 30, a builder, was brought to the hospital. It was stated that whilst leaning over from a scaffolding to speak to another workman, he lost his balance and fell a distance of twenty-eight feet, attempting to save himself, by clutching at a girder in his descent. His past history was good; no fits of any kind; and in his family history there was nothing pointing to epilepsy. On admission he was quite unconscious; there was haemorrhage from the left ear, mouth, and both nostrils, also from a scalp wound over the right eye. Temperature 96° F. Pulse 52. Respirations 28.

February 18th.—He passed a restless night. There were two attacks of haematemesis, fully two pints of blood being brought up. Clots of blood in the pharynx and haemorrhage into the eyelids and loose connective tissue surrounding them. Temperature 97.8° F. Pulse 60. Respirations 28.

February 19th.—Cerebro-spinal fluid is welling up from the ear and the membrane is seen to be perforated. He is very irritable. Temperature 99.5° F. Pulse 72.

February 20th.—Much quieter. All haemorrhage has ceased. Temperature was 100° F. in the morning, but fell to 99° F. in the evening. Pulse 48 and 62.

February 21st.—Discharge of cerebro-spinal fluid still profuse; dressings had to be changed twice in the night.

February 22nd.—Quieter and more intelligent. The temperature has come down to normal. (There was no rise henceforth.)

February 24th.—He is now quite intelligent. The aural discharge has practically ceased. As, in spite of three successive ten-grain doses of
calomel and soap enemata, his bowels have not acted satisfactorily for three days, he was ordered seven grains of pulvis elaterini co., which was effectual.

March 2nd.—Frontal headache. Both eyes now open, but there is diplopia.

March 23rd.—No headache. Vision normal.

April 15th.—He is giddy on getting up, and deaf on the injured side.

April 22nd.—Except for giddiness he says he feels quite well. Discharged to convalescent home.

November, 1904.—He had a fit when in the train.

February, 1905.—A fit when in his garden.

July, 1905.—A fit in bed.

November, 1905.—A fit in his kitchen much more prolonged than the others. His wife states that in these fits he fell suddenly and lost consciousness at once. There was no localised convulsion and no aura. In short, the fits appear to have been identical in onset with those of idiopathic epilepsy. Until after the first fit she says that he seemed little the worse for the accident. He did not complain of headache, and was not irritable or depressed; neither was he affected by the sun. He avoided all alcohol, so cannot speak of its effect. He is still deaf on the injured side and has no sense of smell.

In such cases one has to consider whether the accident was the result or cause of epilepsy. In the vast majority of cases the first manifestation of the disease occurs before the age of 20; this man was 30. There was nothing in his family history pointing to the injury having acted as an exciting cause in the presence of an existing epileptic predisposition. Lastly, the manner of his fall, which he tried to break, was not that which is associated with the sudden complete unconsciousness of epilepsy. The very large amount—more than two pints—of blood which escaped, points to laceration of one of the great sinuses, possibly the cavernous, by which the body of the sphenoid is bounded laterally. This is the weakest part of the base of the skull, and the majority of fractures of the middle fossa pass through it. His life was saved by the fact that the fracture extended through the mucous membrane into the pharynx, and thus its compression was obviated. The lesion, by its nature, afforded the free venesection which Mr. Rawling so strongly urges should be adopted at the very beginning of reaction in cases of fracture of the skull. The facial nerve, which, in the majority of middle fossa fractures, is paralysed either temporarily by pressure of blood clot, as was the sixth nerve here, or permanently by division, in this case escaped. But it will be noticed that deafness occurred on the injured side and persisted. Mr. English,²

1 "Hunterian Lectures on Fractures of the Skull," 1904.
2 "Jacksonian Prize Essay," 1902.
who found this condition present in nine of the seventy-one cases of recovery which he traced, considers that deafness is more often due to the fracture having involved the middle and internal ear than the auditory nerve itself. Haemorrhage from the nose and subsequent loss of smell point to the anterior fossa also having been involved by fracture of the cribiform plate of the ethmoid, with injury to the fine filaments of the olfactory lobes.

The great loss of cerebro-spinal fluid due to the very low pressure in the sub-arachnoid space, is noticeable. Cases are recorded where, in a few hours, pillow and mattress have been soaked by the profuse discharge.

The well-known fact that exceptionally large doses of calomel or other purgatives are necessary to obtain any effect after head injuries, is markedly exemplified here.

In the lectures before mentioned Mr. Rawling says that all cases of fractured skull can be divided into three main groups, according to thermometric changes, excluding any alterations secondary to septic, pulmonary or other complications:—

Group I.—The temperature, at first subnormal, undergoes a steady and progressive rise. The prognosis is most unfavourable; Group II.—The temperature, at first subnormal, rises gradually to 101° F. and 102° F., and then for a short time remains steady. This hesitation marks the crisis of the case, a further rise indicating a probable fatal result, whilst a fall offers hopes of a future recovery; Group III.—The temperature, at first subnormal, remains at that level or rises to about normal without any subsequent further elevation. In the former case the patient, owing to the severity of the injury, never recovers from the state of collapse; whilst in the latter the injury was of so comparatively slight a nature that the stage of shock, being neither prolonged nor deep, was not subsequently followed by the stage of reaction.

He states that these three groups of thermometric changes are so constant that he regards the temperature chart as the surest and almost infallible guide to the prognosis of the case. This case, though the temperature was not actually recorded above 100° F., seems to me to come in the second of these groups, and to bear out his remarks.

As to epilepsy following cranial injury, Sir Wm. Gowers found 108 cases, excluding all doubtful ones, due to trauma out of 3,000. The majority were from depressed or punctured fractures in the motor area. Professor von Bergmann says, that in the German Sanitary Reports for 1870-71, 25 cases of traumatic epilepsy were noted as occurring among 571 cases of shot injuries of the cranial bones, with recovery. This would show only 4.3 per cent. But he states that to these must be added 128 cases affected by epileptiform conditions, such as periodic attacks of

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1 "System of Surgery," vol. i.
dizziness, unconsciousness, &c. Of 167 cases of cranial injury during the American Civil War in men who were previously sound, the pension roll shows 23 epileptics. In Mr. English's 71 cases, 3 were epileptics.

One more particularly associates traumatic epilepsy with convulsions of the Jacksonian or focal type [which start in that part of the body, e.g., the muscles of the thumb, corresponding to the affected centre in the cortex, and gradually extend in a definite order from one group of muscles to adjacent groups. Unilateral at the start, they often spread to the other side and end as general convulsions, at first without, but later accompanied by, loss of consciousness]. This case, however, exemplifies Sir W. Gowers' remark that in some cases general convulsions like those of idiopathic epilepsy follow some more general concussion, which possibly has a widespread influence on nutrition. That cortical lesions, even in the motor area, may give rise to convulsions, exactly like those of idiopathic epilepsy, is considered by Dr. Collier, to be probably dependent upon the rate of discharge and the rapidity with which it spreads. When the discharge is slow and the spread deliberate the typical focal fit occurs. When the discharge is rapid, and the spread so quick that the whole of both cortices are almost simultaneously affected, general convulsions result.

As to the man's mental condition, it will be noticed that, until after the last attack, it was not nearly as much affected as one would have expected after such an injury. Indeed, he felt so well that he neglected to continue the bromide, which was ordered after his first fit, for a month prior to his third attack, and again for two months before his last one. This was unfortunate; for Sir William Gowers says that, as far as we can perceive, medicines act by repressing the discharge, and that it is only after a time that the energy for the discharge ceases to be generated.

Here probably there were adhesion and contraction of the scarred and thickened membranes, with sclerosis of the cortex, on the under surface of the frontal and temporo-sphenoidal lobes; or perhaps a cyst of hemorrhagic origin. Obviously any operation was out of the question, and the prognosis was bad.