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"Some Cases of Head Injury."

The following cases of Head Injury (with the exception of case 24) were admitted into the Victoria Infirmary, while I was house-surgeon there.

Some of those on the list proved very slight; but they are detailed here, because even they were interesting at the time of admission from the point of view of diagnosis and prognosis.

It cannot be claimed that anything original in the diagnosis or treatment of head injuries is brought forward in this Thesis. But to one who, like the writer, had little practical experience of such cases, those recorded here proved very interesting and instructive. Hence I have thought that it may not be an unprofitable task to bring these cases together, and to mention some of the points learned from a study of them.

I shall first give reports of the cases, taking them in the order in which they were admitted to the Infirmary; and then I shall make some

remarks upon interesting features of them.

Case I;— P— B—, aged 12 years; admitted 10th August, 1896, having fallen over a stair from the landing on the third storey. Patient was unconscious for some time, but soon recovered; no bad effects followed. He was seen in the beginning of this year, and then his mother stated that he was in no way the worse of the fall; he played about and did his school work just as before the accident.

Case II;— Mrs W—, aged 45 years; admitted 14th September, 1896. Her husband said that she had had some 'fits' that morning, so she was sent to a medical ward. On further enquiry it was ascertained that on the previous Saturday (12th Sep.) she had fallen while the worse of liquor, and had injured her head. On Sunday, the 13th, she remained in bed; she complained of pain about the head, but was quite sensible and spoke readily to her husband. On the morning of the 14th she had two 'fits', in which there was said to be twitching of the arms and foaming at the mouth. She had not given an intelligible answer to any

question after the first fit occurred.
On admission there was a superficial scalp wound over right side of occiput; there was no evidence of fracture. There was slight paresis of the muscles of the cheek on right side; no paralysis of limbs. No information could be got from patient herself; when questioned, she muttered something which was quite unintelligible. When in bed, she did not like to be disturbed, preferring to lie coiled up. Urine was passed in bed.
Examination of the urine shewed the presence of a large quantity of albumen. Patient had had some 'fits' 12 years previously during childbirth, but none from that date to day of admission.
On the morning of the 16th she had six slight con--vulsive seizures affecting the right side of face and right arm. Following these there was a seizure which became general. In the course of the day she had several seizures, in most of which the right side of face only was affected, the head being turned to right shoulder, and eyes looking in same direction. In those seizures which became general the right side was always more affected than the left, & the head was always turned towards

the right shoulder.
On the 17th a chloral and bromide mixture was given; there were no convulsive seizures during that day.
The sedative was discontinued on the 18th, and the convulsions recurred.
Patient lay in bed in a heaped-up condition; it was with difficulty that she could be roused. When asked a question she evidently made an attempt to answer, but could not articulate. The paralysis of right side of face persisted; and now there was observed some paralysis of the muscles of right hand, wrist drop being present. Sensation was not impaired; and the reflexes appeared normal.
Temperature on admission had been 100°F; it rose to 102°, remained there for two days, and then fell to normal.
The Surgeon saw patient at this time, and came to the conclusion that there was pressure on the left side of brain, about the region of Broca's convolution. So on the 19th the skull was trephined at this spot. On removing the disc of bone the dura mater was found to be somewhat lustreless. On incising the dura mater a large quantity of dark blood escaped; this was aided by the introduction of a director;

a considerable quantity of clot also was removed. The dura mater was then brought together; the disc of bone was not replaced.

Patient did very well after operation. There was no recurrence of the convulsions; she recovered full use of the right hand; she became livelier and took an interest in her surroundings. Within two days she was able to answer some questions, and she steadily recovered the power of speech.

She went home on the 24th of October.

Two or three months later she came up to hospital, and was found to be very well.

Enquiry was made about her in February of the present year. It was ascertained that about three weeks previously she had disappeared; owing to her drinking habits her life had been very unhappy. A woman with whom she had been living for some time before her disappearance said that she was very active; that she could write well and corresponded with a relative abroad; and that she made herself useful in the way of making clothes for the children.

Case III; M— A—; aged 19 years; admitted 30th October, 1896.
Patient fell from a van, and for two days he was very drowsy.
He was seen in May of this year; there were no bad effects of the accident.

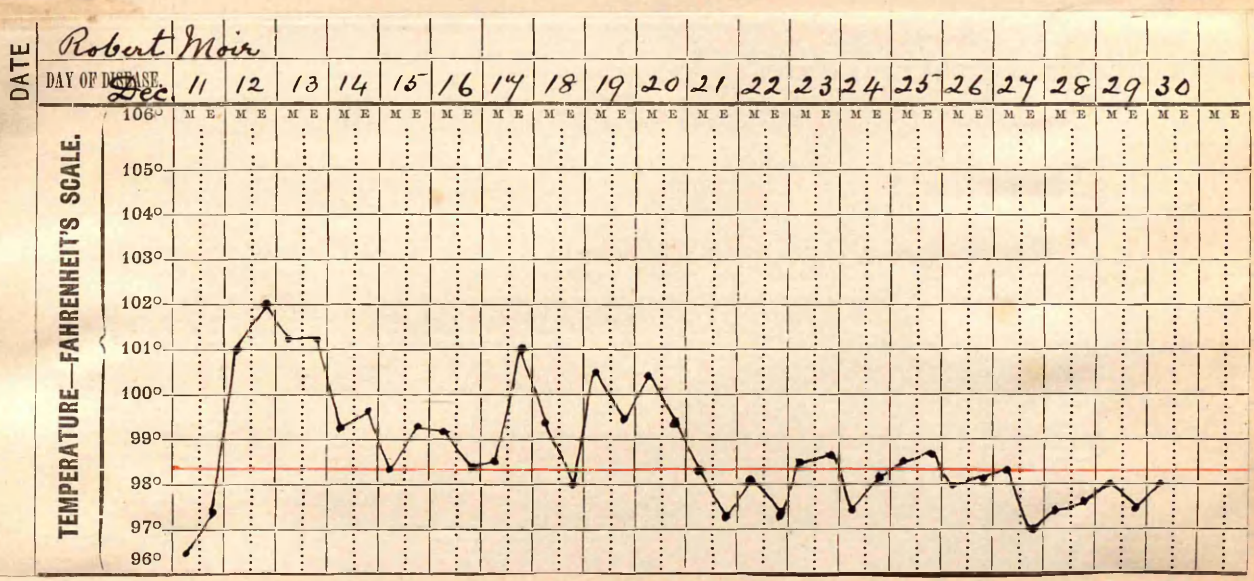
Case IV:- H— P—; aged 9 years; admitted 2nd December, 1896.
While at play on the evening of 30th November he fell. He walked home, went to bed, and gradually became unconscious. He was unconscious all the following day. On the second day of illness, as he was still unconscious, the doctor ordered removal to hospital. He was brought from Hamilton in an ambulance waggon; while on the journey he regained consciousness.
On admission he looked decidedly stupid. He did not answer questions readily; and when asked to do anything he did it very slowly. There appeared to be slight wrist-drop on the right side; but when he was roused and his attention fixed, he could raise the arm and hand; the grip of right hand was as good as that of left. No facial paralysis. No sign of fracture of skull.

For the first day after admission he lay in bed in a dazed, semi-unconscious state, not being inclined to speak at all.
Within four or five days he had entirely recovered.

Case V;- J— D— ; aged 19 years; admitted December 1896, suffering from injuries the result of a fall from the roof of a three-storey house.
On admission he was unconscious; respiration was irregular; the pulse was feeble and rapid. There was a large swelling over the left parietal bone; there was great effusion into eyelids of left eye.
Patient gradually sank, and died two hours after admission, the respiration failing first.
At the post-mortem examination a little effused blood was found in the sub-arachnoid space, but there was no effusion pressing on the brain at any part, and no clot. The frontal lobe on left side was lacerated; with this exception the cerebrum and cerebellum were normal.
Fracture of the base was found passing right across at junction of ethmoid and sphenoid bones; the fracture extended up into the left parietal region.

Case VI:— R— M—; aged 60 years; admitted 11th December, 1896.
It was said that patient had been intoxicated and had fallen downstairs. On admission he was unconscious. The pupils were equal. There was haemorrhage from both ears, more copious from the left. Temperature on admission was sub-normal; pulse rate was 100.
The following notes were made in the progress of the case;—
Dec. 12th "Patient still unconscious, and restless. Urine passed in bed. The haemorrhage from ears has ceased."
Dec. 14th "Patient conscious, but very drowsy, and takes no interest in anything. Has to be roused for his food."
Dec. 16th "Very restless and garrulous, but does not yet recognise his friends."
Dec 25th "No improvement in patients condition. He is very restless and noisy at times. Urine and faeces passed in bed."
On 30th December patient was sent to Gartnavel Asylum, as the other patients in the Ward were disturbed by the noise.
On the next page is the record of his temperature while he

was in the Victoria



No paralysis was noted while he was in the Victoria Infirmary, but after he was sent to Gartnavel it was observed that there was some loss of expression on the right side of face, that the right eye could not be tightly closed, and that the tongue was protruded to the right. As regarded his mental condition it was stated that he was foolish and weak-minded, and that he mistook identities.

By the end of February, 1894, he had regained control over rectum and bladder. His mental condition then was one of mild dementia, with some memory weakness.

After this patient improved in every way; he put

on flesh, gained strength, and was able to walk about. There was considerable improvement also in the mental condition.

On the 23rd December, 1894, patient had a series of convulsions. There were clonic spasms affecting the face, arms and legs; the legs were less affected than the arms, and the left leg less than the right. He became unconscious. There seemed to be slight paresis of left side of face, and of right leg.

He regained consciousness on the 25th, and seemed to be improving until on the 27th he had another series of convulsions and died.

It was noted that there was arterial degeneration, but there is no record of an examination of the urine.

Post-Mortem examination;- "over the upper and fore part of both frontal lobes the membranes were adherent to the calvaria and to the brain. At these parts of the frontal lobes there was marked yellow colouration of the cerebral tissue (evidently from an old haemorrhage), and there was great diminution of the grey matter of the cortex. There were the same changes, but to a less extent, in the anterior parts of both temporo-sphenoidal lobes. Several punctiform haemorrhages were

found in the substance of the basal ganglia.
There was no fracture of the skull.
Heart;— mitral valve was incompetent; there was arteris-sclerosis of aortic valves and aorta.
The other organs were healthy."
The appearances over the vertex of brain were regarded as the result of laceration by contre-coup at time of accident. It is difficult to say what was the cause of death.

Case VII:— J— D—; aged 5-4 years; admitted 25-th January, 1894, unconscious, with slight odour of spirits.
The following history was obtained from a companion. Patient had left his house in the morning without any breakfast; he had several glasses of whisky during the forenoon. About noon patient, while walking along the street, suddenly slipped and fell, striking the ground heavily with the back of his head, he was stunned, but on being raised by some police officers he walked with them several hundred yards, when he became gradually quite unconscious, and was brought to hospital in that condition. After his fall he bled slightly from the nose.

On admission he could not be roused to speak, but he moved his right hand and arm when his ribs were rubbed. Breathing was stertorous; the left cheek and side of mouth flapped backwards and forwards with the breathing. There was no haemorrhage from the ears, and no sub-conjunctival haemorrhage. The pupils were equal and reacted normally. It was noticed that he did not move the left arm; and the left leg was not moved so freely as the right. Throughout the following day he continued unconscious; he could be roused to open his eyes, but made no attempt to answer questions. Pupils remained equal.

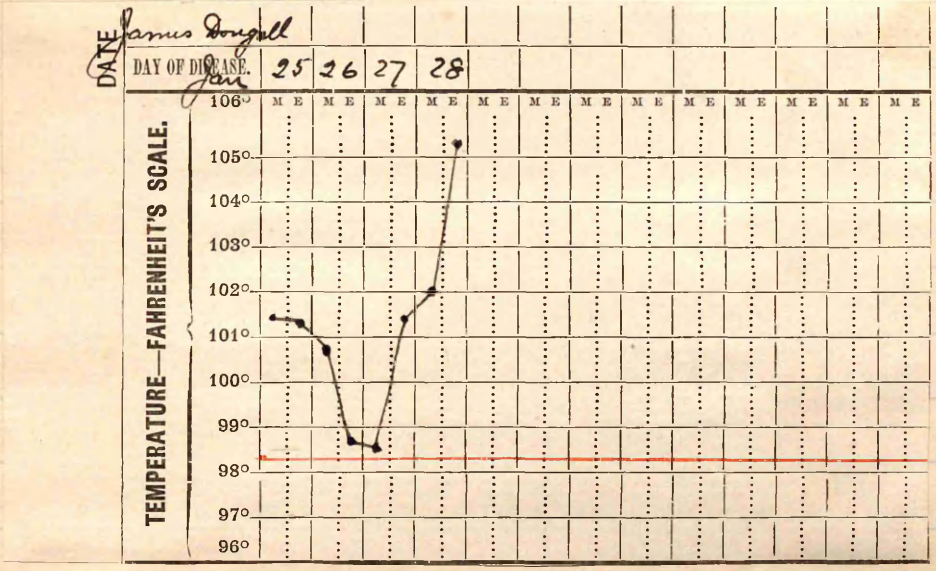
On the morning of this day (day after admission) slight twitching of the left side of face was first observed. There were four such seizures in the course of the day. Similar seizures occurred at short intervals during the night of the 26th; and on the morning of the 24th.

The characters of a convulsive seizure which was closely observed, were as follows;— the eyes opened slightly and the eyeballs deviated to the extreme left, the left pupil becoming somewhat dilated; then spasmodic contractions of mouth

and left side of face occurred, the mouth being pulled rapidly to the left; after this the muscles of the left eye began to twitch, the muscles of right eye associating themselves with those of left in slighter spasms; at the same time the fingers of left hand worked as if rolling a cigarette; the arm and left leg were not agitated in the slightest degree. As the seizure wore off, respiration became of a crowing character, as if there were some spasm of the glottis; after this patient made two or three coughs and expelled some saliva, which flowed out of the left side of his mouth. As the spasm passed off, the eyes returned to the middle line, and the breathing became slower and more natural.

On the morning of the 24th the skull was trephined on the right side over the motor area for face. A disc of bone was removed, and the dura mater exposed; on puncturing this membrane a jet of dark fluid blood spouted out with considerable force; and, after opening up the dura mater more freely a considerable mass of coagulated blood was removed from a considerable area around. As there was no evidence of active haemorrhage during operation, it was decided not to proceed further;

the flaps of dura mater were then stitched, and the disc of bone was replaced.
Even after the removal of this large amount of blood the paralysis of left arm and leg persisted, as did the unconscious condition of patient. The convulsions of left side of face also continued, but at longer intervals. In the evening of day of operation the first general convulsion was noticed, beginning on left side of face, spreading to left arm and leg successively, and thereafter attacking the whole of right side of body.
Similar convulsions occurred at intervals during the 28th. The paralysis of left side of body became more complete. The eyes were more or less continually turned to the left, with a similar deviation of the head.
The convulsive attacks gradually became less frequent and less severe. Patient died early on the morning of the 29th.
On the next page is a chart of his morning and evening temperatures; —



Post-mortem examination;— On removing the dura mater, the frontal lobe on right side was found extensively lacerated by contre coup, there being no injury to the dura or calvaria here. The basal region of cerebrum was normal, as was also the cerebellum. A fracture of the base extended from the occipital suture on the left side about 1½" from the middle line across the lower part of left parietal bone, and followed the suture between the parietal and temporal bones for some distance.

Case VIII:— J— H—; aged 51 years; admitted on 2nd February, 1894, with a wound over the left frontal region and another over the left parietal.

For thirty years patient had been subject to epileptic fits. While at work on the morning of 2nd February he took a fit and fell, striking his head on an iron rail. He was unconscious for one hour after the fall.

When admitted to hospital there was ecchymosis of eyelids of left eye, but no sub-conjunctival haemorrhage. Pupils were dilated, but equal. There had been some bleeding from both nostrils. There was no haemorrhage, no escape of cerebro-spinal fluid from either ear. No evidence of paralysis. He did not vomit on regaining consciousness.

He soon felt all right, with the exception of slight headache. His temperature on admission was normal, and continued so.

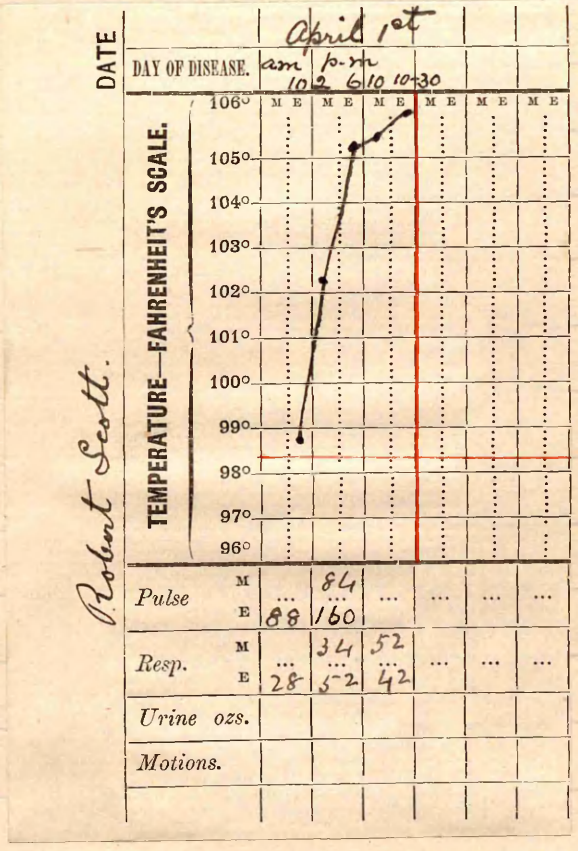
On 11th February he had an ordinary epileptic fit. He went home that day.

Case IX;— J— H—; aged 25 years; admitted 29th March, 1894, slightly concussed, and with some scalp wounds

got by a fall of stone from the roof of an underground quarry.
Patient was soon all right.
He was seen in March of this year, when he was quite well.

Case X:- R— S— ; aged 52 years; admitted on the morning of April 1st, 1894.
Patient had fallen from a height of three storeys. On admission he was unconscious; the breathing was stertorous; the right pupil was slightly more con- -tracted than left. Sub-conjunctival haemorrhage was present in right eye; no haemorrhage from either ear. There was an abrasion of nose, and there was blood about the right nostril. There was a small scalp wound on the forehead, a long wound over vertex, and a deep one on right side of occiput. No fracture was detected through the wounds. No paralysis was made out.
In the course of the day the pulse became very rapid, and the respirations frequent.
The gradual rise of temperature from admission to death is shewn in chart on next page.

No twitchings or convulsions were observed.
Patient did not regain consciousness, and died at 11-50 p.m.



Post-mortem examination: On removing the scalp a fracture of the right parietal bone was found, extending horizontally above the temporal bone and midway between the latter and the temporal ridge; it dipped into the base before it reached the frontal bone.

On removing the calvaria a large quantity of

blood (mostly fluid) escaped from over the convolutions on the left side, no blood being present on the right side.
The left frontal and temporo-sphenoidal lobes were considerably lacerated, evidently by contre-coup.
On removing brain there was found considerable effusion of blood among the basal parts also; and the superior aspect of cerebellum was covered with coagulated blood. There was no haemorrhage in interior of brain.
On removing dura mater the fracture before noted, was found to extend across the lesser wing of sphenoid and end in two branches, one of which lost itself in the optic foramen, and the other extended over to right cribriform plate of ethmoid bone.

Case XI;— J— B—; aged 28 years; admitted 2nd April, 1894.
Patient had been Kicked by a horse, and was very drowsy. He had a strong smell of alcohol, but his companion said he was not intoxicated.
He could be roused when spoken to loudly.
There was a wound over right eyebrow. No sign

of fracture of skull.
On the following day he was quite conscious, and admitted that he was drunk at the time of the accident.
He was dismissed well.

Case XII:- R— K—; aged 18 years; admitted on April 3rd, 1894.
Patient had fallen to the ground while attempting to descend by means of a rhone from the window of a house he had broken into. He was partly unconscious, and smelt strongly of alcohol. He could be roused to answer questions, and he gave his name quite correctly and distinctly.
There was a scalp wound over left eye; no sign of fracture.
On the following day patient was quite conscious, and confessed to alcoholism on the night of admission.
He was dismissed well.

Case XIII;- E— W—; aged 24 years; admitted 2nd May, 1894.
While going down a hill patient lost control of

his bicyle, and was thrown against a wall. He was unconscious for some hours afterwards. There was a scalp wound; but no evidence of fracture. He soon felt all right.
He was seen in May of this year; he stated that he was none the worse of the accident.

Case XIV; J— M—; aged 38 years; was admitted on the evening of 4th May, 189-, in a dazed and stupefied condition.
Patient fell downstairs on Saturday, May 1st, and knocked the back of his head on the ground; it was not known exactly how far he fell. After being picked up he was put to bed, where he remained until brought to hospital.
His wife stated that on the day following the accident he spoke fairly distinctly, but not at all like his usual. On Monday, the 3rd May, he wanted to go out to work, but his speech was so peculiar that his wife thought there must be something wrong with him, and insisted on his staying in bed. His manner too appeared to her strange, as he seemed not to heed what

she said, but Kept on trying to get out of bed.
On Tuesday - the day of his admission to hospital - his speech was quite incomprehensible to his wife; he was unable to articulate properly, but rambled on, muttering confusedly.
While at home he had no convulsions. He complained much of pain in the back of his head and also in his neck.
On admission patient's face was somewhat flushed; his pupils were dilated, and there was marked nystagmus. Temperature was 103·4; pulse was of very low tension, its rate was 60.
Patient lay in bed with his head thrown back, preferring to lie on his face with his face raised from the pillow. The opisthotonic position was very marked when he lay on his side. He was very restless and stupid; he made attempts to answer questions, but his words were so hopelessly slurred as to be for the most part quite in- -comprehensible. He gave his name correctly, but slurred the words in an aphasic like manner.
There was a swelling on the back of the head over the occipital protuberance. There was no bleeding from nose, nor from ears; no

sub-conjunctival haemorrhage, nor other sign of fracture. No paralysis of limbs, nor of cranial nerves was observed.

On 5th May patient became worse. In the morning he had several attacks of dyspnoea, accompanied by lividity and profuse cold sweats, and in the evening something similar was noticed.

Temperature in the morning was 102·4, and in the evening 101°. Pulse was very weak and rapid; respiration was of the Cheyne-Stokes type. The cervical opisthotonus was not so marked; there was distinct tenderness on pressure over the sub-occipital region on both sides. Patient lay on his back, being quite unconscious; his eyes remained wide open and staring, with pupils extremely dilated and equal, responding only slightly and sluggishly, if at all, to light. There was some tendency to deviation of the head towards the right, but no conjugate deviation of the eyes. There was no evidence of paralysis; there were no convulsions. The right arm was constantly raised to patient's head in an erratic sort of way, flexed at wrist and elbow; it was found to be somewhat rigid when laid again by his side.

There was no vomiting at any time.
Patient's comatose condition increased in profundity, and he died early on the morning of 6th May.
Temperature before death was 103°8.
Post-mortem examination;- There was found a diffuse lepto-meningitis involving both base and convexity of brain. Numerous puncta cruenta were dotted all over the surface of the organ, and some were also found after the brain was sliced. Broca's lobe was extensively lacerated, and several smaller lacerations were discovered at various parts. A fissured fracture extended from the foramen magnum upwards obliquely for about 5" in the right occiput.

Case XV:- G— G—; aged 40 years; admitted 17th May, 1894.
Patient had fallen from a scaffolding 18 feet high. On admission he was unconscious, but could be roused to speak intelligently, quickly however lapsing into his profoundly dazed condition. Blood was flowing in considerable quantity from his left ear. There was a scalp wound over left parietal region; while this was being dressed,

patient became obstreperous, shouting loudly words which were pronounced perfectly well; his sentences were rambling and stupid however, and plainly indicated that he knew nothing about himself as to where he was or who was speaking to him.
Within four days he had become quieter, although he was still somewhat stupid and occasionally talked nonsense. He complained much of pain in his head. There was no symptom of pressure.
He was sent home on 29th May, with cautions to his wife regarding absolute rest for a month.
On the evening of day after admission the temperature rose to 99°8; it then became normal and remained so.
Patient was seen on 9th February of this year. He had not worked much at his trade of a slater since the accident. He complained of slight deafness in the left ear; and said that since the injury to his head his memory often failed him, he being often unable for some minutes to remember the names of persons whom he met and with whom he was well acquainted. There was no defect of vision. He had no pain in the head.

He found that after the accident he was more speedily affected by alcohol, a quantity which he could carry easily before that making him intoxicated. He also stated that he could not remember going out to his work on the morning of the day on which the accident happened, nor anything that occurred in the course of that day.

Case XVI;— J— J— aged 30 years; admitted on 17th May, 1894, in a dazed and stupid condition, having fallen from a scaffold 18 feet high.
Though drowsy he could easily be roused. There was no evident injury to head beyond a black eye. He had had some bleeding from both nostrils; there was no abrasion or mark on the face.
Four days later it was noted that he had recovered considerably from his drowsy condition, but was still somewhat stupid; he answered questions hesitatingly, and was unable to recognise, or at least to name, persons with whom he was quite familiar.
He was sent home on 26th May to lie up; he complained of headache.

Temperature was normal during residence.
Inquiries were made about him in March of this year. His mother stated that he did not then complain of headache; he had had no convulsions; and his hearing and sight were good. He went to his work regularly. His mother found him more irritable than he had been before the accident, and said that she had to take care not to cross him. She also stated that since the accident a very small quantity of liquor, even one glass, "went to his head," a quantity which formerly had not affected him in the least.

Case XVII:- J— Fe—; aged 8 years; admitted 6th June, 1894.
It was said that patient had fallen through a sky-light window on the roof of a shed to the floor, a distance of over 20 feet. He had been unconscious when found and remained so.
On admission to hospital he was in a drowsy condition; he could not be got to answer any questions; when touched, he turned in bed and complained. He became very restless, shifting about in bed and crying out.

Both bones of the right arm were broken.
There was ecchymosis of the left eyelids; no sub-conjunctival haemorrhage was seen. A slight discharge of blood was observed coming from the left nostril. The pupils were equal. When patient cried it was noticed that the mouth was pulled slightly to the left. No paralysis of the limbs was observed at this time.
Patient continued in the same drowsy and irritable condition for the two days following admission. Even when he sat up in bed and was spoken to, he was not able to answer, his usual response being a cry. It was then observed that he did not move the right arm or leg much. No twitchings were seen. Some irregularity of the surface of the skull was felt over the left parietal.
On 9th June patient was operated on, the intention being to trephine the skull over the lower motor areas on the left side. When the bone was exposed, a comminuted fracture was seen passing backwards towards the occipital region. One small fragment of bone and a large irregular fragment, were removed. No fluid blood or clot was found on the surface of brain; but

there was evidence of great laceration of the brain, a considerable quantity of loose cerebral tissue being removed. The pericranium and scalp were then sutured, the pieces of bone not being replaced.

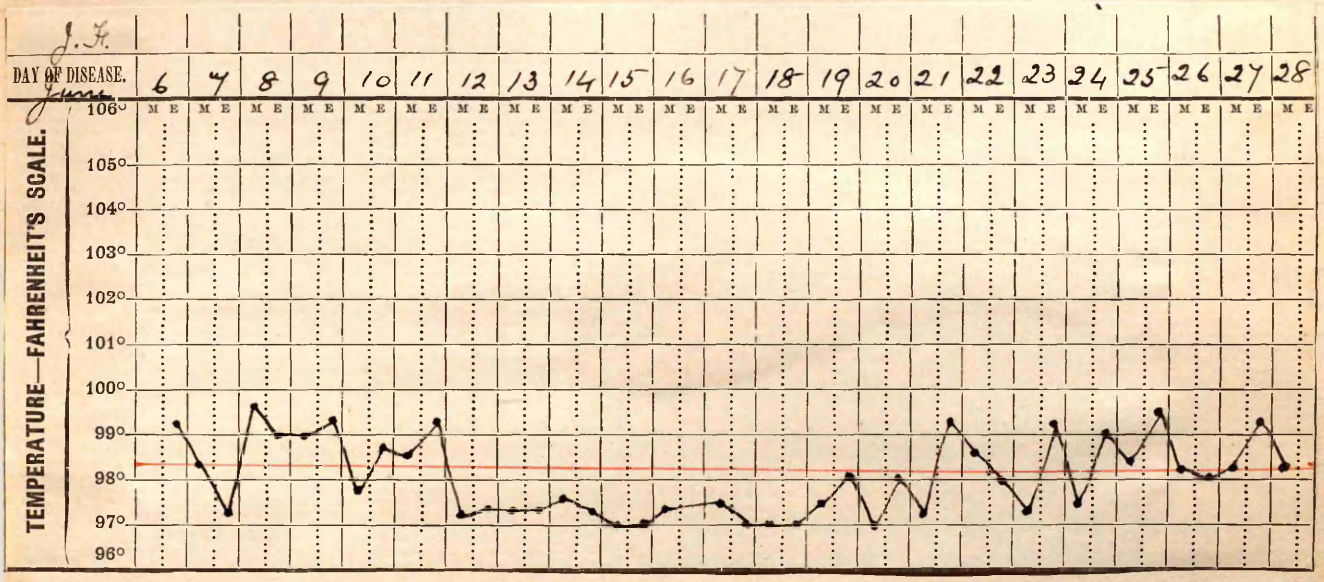
Patient steadily improved after operation. Within four days he had quite recovered consciousness; he was aphasic however. He would hold out his left hand or put out his tongue, if asked to do so; but his invariable answer to questions of all sorts was 'yes.' The next word he uttered was 'hame.' He improved rapidly in this respect; by the end of June he used many words; but even then, when he got hold of a word he was apt to use it for a time indiscriminately. Before he could frame a complete sentence he used to sing some popular comic songs, rendering the words and air with great correctness.

He slowly recovered the use of right arm and leg.

Patient left hospital in the end of July. Then there was no trace of paralysis. He still had occasional difficulty in finding the right word.

On the next page is a record of his temperature during

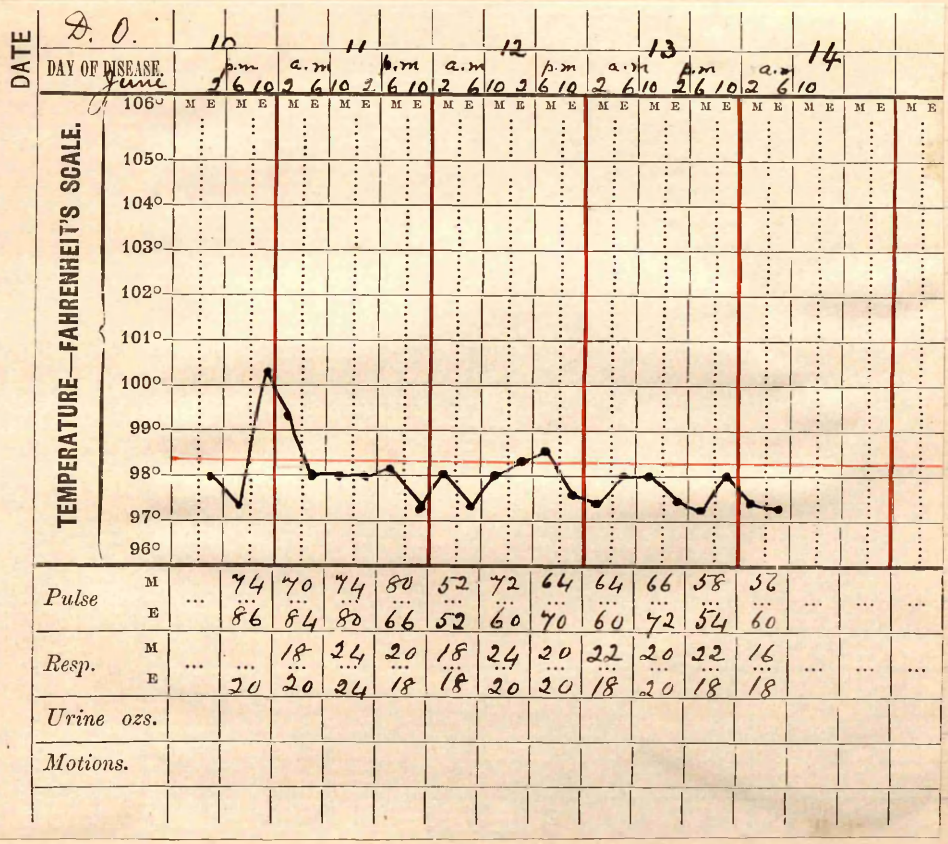
the first three weeks of residence.



Patient is now running about at home. There is no defect in his gait or in the movements of arms. For some time after going home he had some difficulty with words, often calling those in the house by the wrong names. Now he can always get the right word, but stutters occasionally. It is difficult to estimate his mental attainments. Before the accident he was a somewhat backward scholar; this was very likely the result of his irregular attendance at school; his mother is a very bad character, and the boy is allowed to run the streets as he likes; the consequence is, he is seldom at school. In games, however,

he seems to be as keen and smart as other boys. He does not complain at all of his head.

Case XVIII: D— O—; aged 44 years; admitted 10th June, 1894.
Patient fell a distance of 10 feet, and was unconscious for about 10 minutes after the fall.
When admitted to hospital shortly after the accident he was somewhat dazed, but was able to answer questions. There was no sign of fracture of the skull. The right pupil was rather larger than the left.
In the evening he became restless and irritable; he also became more stupid, but could still be roused to answer questions. No twitchings were observed; there was no paralysis.
On the following day he continued very drowsy; his face was very much flushed. Then for the next three nights he was very restless, and could not be kept in bed.
On the 14th his wife insisted on taking him home.
On the next page is chart of his temperature during residence.



Pulse	M	...	74	70	74	80	52	72	64	64	66	58	56	...	...	...
	E		86	84	80	66	52	60	70	60	72	54	60			
Resp.	M	...	...	18	24	20	18	24	20	22	20	22	16	...	...	...
	E		20	20	24	18	18	20	20	18	20	18	18			
Urine ozs.																
Motions.																

After 6 or 7 weeks' rest at home patient & went back to work. He was seen in May of this year. He complained most of defective sight; the eyes were examined with the ophthalmoscope and evidences of optic neuritis were seen; patient said that his sight had commenced to fail after the accident. His hearing was not deficient; memory was good. There was no complaint of headache. His wife said that she found him more irritable than before the accident.

Case XIX:- J— C—; aged 14 years; admitted 21st June, 1894.
While going along the railway to his work patient was knocked down by an engine, and was rendered unconscious. On admission blood was flowing fairly freely from both ears. He was somewhat dazed and stupid, and could give no account of the accident.
He was dismissed well on 4th July.
He was seen in February of this year, and then was quite free from any bad effects, and was able to do his work as clerk in a signal box on the railway.

Case XX;- W— M—; aged 52 years; admitted on 22nd June, 1894, as a case of fractured ribs.
Full particulars of the accident could not be obtained, but it was understood that patient while engaged cleaning a window, had fallen from a height of one storey. He was very stupid, and could not tell how he got hurt. He was able to walk however, and gave his name correctly to the man who assisted him in undressing. There was surgical emphysema over right side of

chest, and crepitus was made out.
Temperature on admission was 97°.
On the following day (23rd) it was evident that patient was suffering from the effects of injury to the head. There was no external injury, nor any sign of fracture, but patient was aphasic to a certain extent; his vocabulary was fairly extensive, but there were some words which he could not get hold of, and he endeavoured to express his meaning by gestures. There was no paralysis of face or limbs. The temperature rose to 101°4.
On the afternoon of June 24th he had a convulsive seizure affecting chiefly the face.
On the 25th he had eight convulsive seizures; in one of these the head and eyes were turned towards the right and the right side of face twitched, afterwards the convulsion became general. After these fits slight ptosis of right upper eyelid was observed; there was no paralysis of limbs. Patient was still conscious in the intervals between the fits; but the aphasia was more marked than on the preceding day. Temperature had now fallen to about normal.

Patient rested quietly during the night of the 25th; he made signs for a drink and for the slipper when he wanted these, but he did not speak.

On the morning of the 26th he had another series of convulsive attacks. Some of the seizures were slight, affecting only the right side of face. In one the twitching began, as on the previous day, on the right side of face, then the right arm and both legs became rigid, but in what order was not observed; the left arm was not affected at all; towards the end of the fit there were twitchings of the right arm and right leg, but not of left leg.

The ptosis of right eyelid was still present; and the right arm and leg remained limp. The right pupil was larger than the left. After these fits patient became unconscious and could no longer be got to do what was wanted of him.

On that same morning the skull was trephined on the left side at the spot for the middle meningeal artery. There was no blood between bone and dura mater; on incising the latter there was a free flow of dark fluid blood; no clot was found. On passing a director towards the temporo-sphenoidal lobe small particles

resembling brain substance were brought away. The dura mater was stitched, and the pericranium was brought together over the opening in the bone, the disc of bone not being replaced.
(Urine contained no albumen).
For some time after the operation patient was much more intelligent. On one occasion he was seen to move the right arm. But on the afternoon of that day the fits recurred, and loss of power again affected the right side of face and the right arm.
During the night convulsions occurred at short intervals, and patient died on the morning of the 24th.
There was found at the post-mortem examination laceration in the middle of left temporo-sphenoidal lobe, and there was some clot in that neighbourhood. There was no fracture of the skull.

Case XXI; A— A—; aged 6 years; admitted 26th June, 1894.
Patient fell from a height of two storeys into a back court. When picked up he was unconscious,

and was so & when brought to hospital two hours later.

After admission he could not be got to answer any questions; but while being washed he struggled, and cried "daddy."

There was a deep wound above left eyebrow, but no fracture was detected. No other injury to head was observed. There was no paralysis.

For two or three days patient dozed most of the time; he spoke only when touched; and when touched or spoken to he was very irritable.

Temperature rose to 100°4 on day after admission, and then fell to normal.

On the 30th June he was brighter, sitting up in bed and taking notice of what was going on in the ward. On July 1st he recognized his mother for the first time; in a day or two from that date he had quite recovered.

Was dismissed on 20th July.

Patient was seen in February of this year. His mother then stated that he was as well as before the accident. He had gone back to school and had passed the usual examination. He never complained of his head.

Case XXII;- J— b—; aged 82 years; admitted on 8th July 1894.

Patient, having been left in the house by herself, had been assaulted by two burglars. She had been struck upon the head by a weapon such as a crowbar. The neighbours found her lying in the close; she had lost a lot of blood from the wounds on head. When found by the neighbours she was able to say that some men had attacked her.

On admission she was in a very dazed condition, and was not able to give any account of how she had been hurt. She muttered in an unintelligible fashion. When the scalp wounds were being dressed, however, she roused herself and resisted vigorously, and said quite loudly and plainly that it was 'cruel'. She could not be said to recognize her friends when they came to see her that evening.

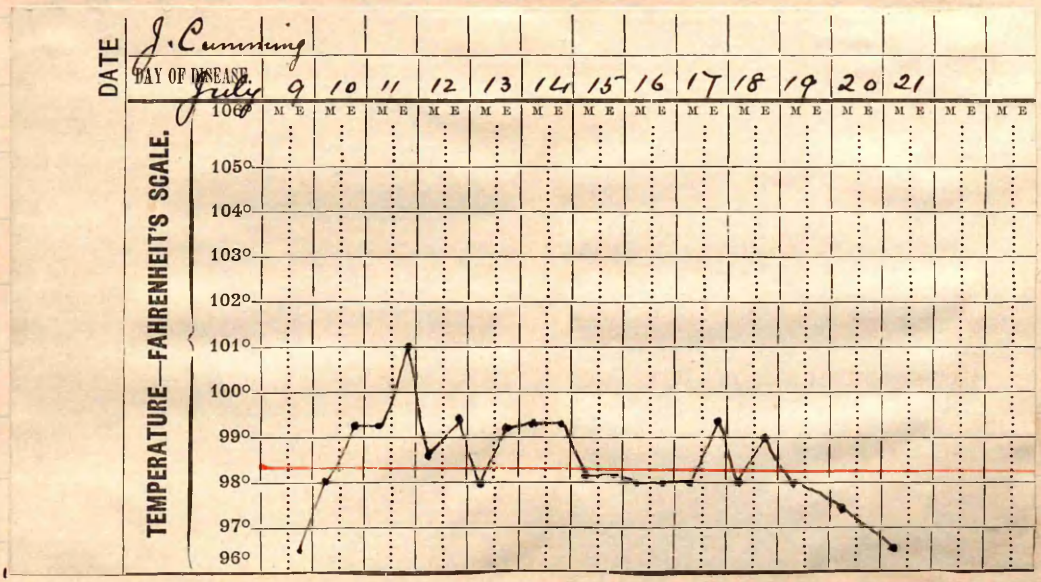
There were four wounds on head; there was a deep one on each side of forehead, reaching down to the bone and each about 1½" long; there was another wound, reaching down to the bone, over right parietal eminence; and the fourth wound was a small superficial one on left side of head.

There was no paralysis, and no sign of fracture of the skull.

The scalp wounds did well. But patient's general condition did not improve much; she became somewhat brighter and looked about her more, but she did not appear to know where she was, did not know her friends, and sometimes called the nurses by the names of friends. She could not give any intelligible answers to questions. There were no convulsive seizures.

After some days she became very restless; slept very little; often got out of bed, and made a great deal of noise.

The following is her temperature chart:-



At the end of a fortnight she became quieter; she became very weak, and was almost comatose for about a day before death on the 23rd July. At no time were there convulsions, nor did any paralysis develop.
Post-mortem examination;- There was extensive laceration of the left temporo-sphenoidal lobe, and a clot lay beneath the dura mater over this region. The brain tissue around was oedematous. There was no fracture of skull.

Case XXIII:- W- McM—; aged 38 years; admitted 24th July, 1899. Patient fell down a flight of six steps on the morning of the 23rd, and according to his friends was picked up and taken home in an unconscious condition. He was drunk at the time of the accident, and had been 'fooling' with a friend when he fell. After being taken home he remained drowsy, but not un-conscious. The friends who brought him to hospital said that he had had three 'fits,' one on the 23rd, and two on the day of admission to hospital. On questioning an eye-witness doubt was thrown upon this statement; from the

description of the fits it appeared rather as if patient had been retching.

On admission patient was drowsy, but he readily and intelligently answered questions, and even started conversation once he was roused. His face was flushed. The pupils were equal, and moderately dilated. There was no evidence of facial or other paralysis. There was no sign of fracture of skull. There was a superficial scalp wound on right side of head. Respiration was easy, not stertorous, 24 per minute; pulse was soft, its rate 64; temperature was normal. Patient complained of headache.

On the following day he was less drowsy; still complained of headache.

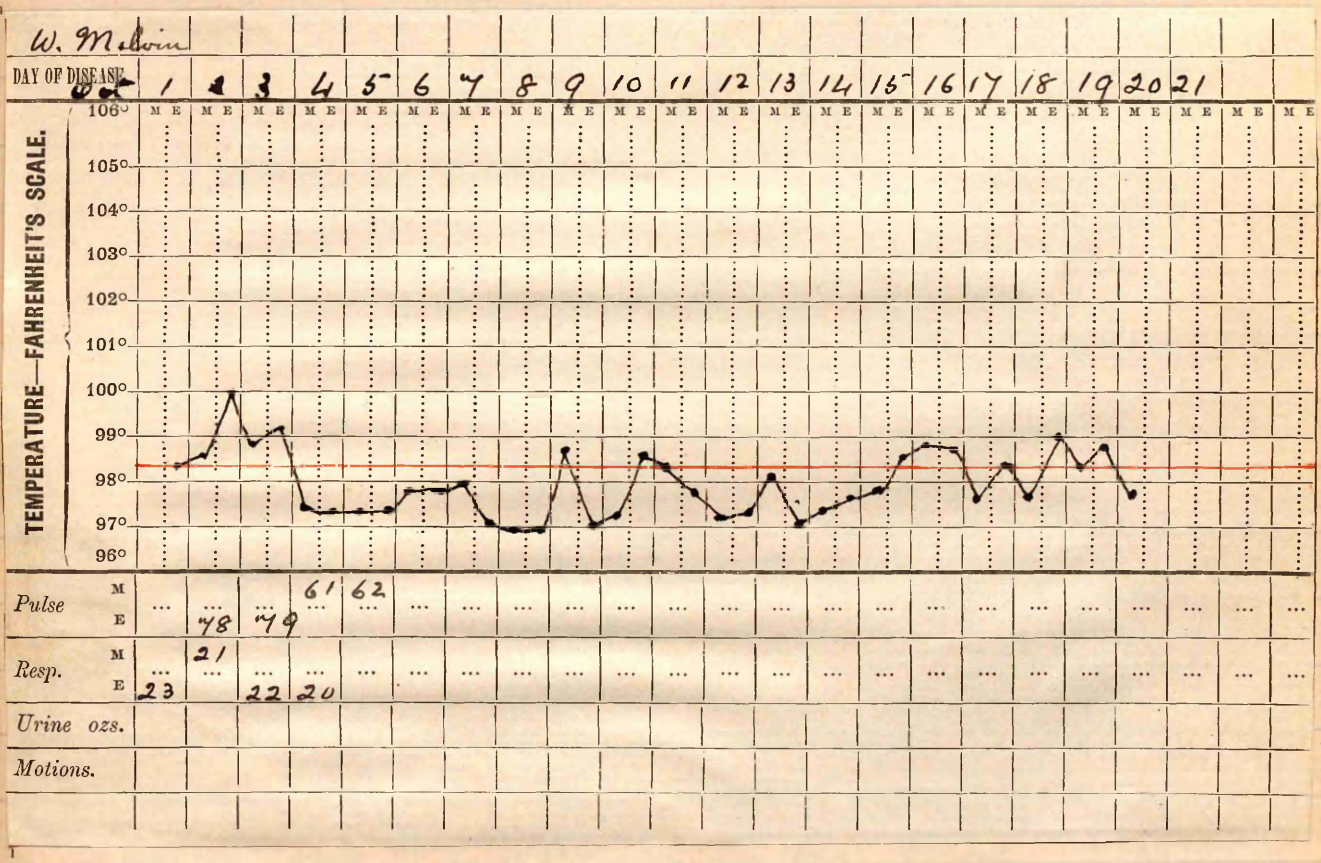
On the 26th patient shewed signs of mental excitement. He did not seem to realize where he was, or to understand that he was ill. He became restless and tried to get out of bed. He talked freely, and seemed rather 'jolly'; his conversation was quite intelligible, but rambling. There was tremor of the tongue when protruded. No convulsions occurred.

A watchman had to be got to sit with patient.

On the 24th he had distinct delusions and hallucinations. The diagnosis of delirium tremens was made, and patient was removed to Paisley Asylum.
After a short residence there he recovered completely; and when last heard of he was well.

Case XXIV: W— M—; aged 10 years; admitted 1st Oct. 1894.
Patient had been sliding down the railing of a stair leading to Gushetfaulds Station, when he overbalanced and fell a distance of 15 feet. He was picked up in an unconscious state.
It was stated on admission that blood had been flowing from both nostrils, and there was evidence of this still to be seen. There was a haematoma over the left frontal eminence, through which it was impossible to make out any fracture. There was no sub-conjunctival haemorrhage.
The pupils were somewhat dilated, but equal, and reacted normally. Pulse was weak, its rate 78; respirations were shallow, and numbered 23 per minute.
A record of temperature during residence is given

in the following chart.



Patient was not easily roused, and when disturbed he became very irritable. He lay coiled up in bed, legs flexed upon thighs, and thighs on abdomen; head also bent forward on chest. He vomited several times after admission; the vomited matter contained particles of what looked like decolorized blood clot.

In the evening of the day of admission he was much more easily roused, but still did not know

where he was, nor what was said to him; he was still very irritable.

On the following day he was able to tell his name, age and address correctly, but when spoken to for a little while he began to wander and give absurd answers.

When the haematoma disappeared, there were no signs of depressed fracture.

After being two or three days in hospital patient became very restless; for some days there was no reasoning with him at all; he called out frequently for his father, who was dead, and for his mother and brother. Sometimes he got out of bed and wandered about the ward; once he made his way to a ward in the flat below. Before the accident he had been in the habit of going out with newspapers morning and night, and it was noticed that when the hours at which he used to do so came round, he was specially noisy and unmanageable.

This condition lasted for about a week, at the end of which time he became quiet and sensible. He was dismissed on 20th October.

Patient was seen in February of this year. He

was then at school, and had no difficulty with his lessons. His memory was good. In January he passed the usual school examination. His disposition was much the same as before the accident. There was no complaint of headache. Sight was good.

These are the cases. I shall now mention some of the interesting features of them, and indicate the points which they suggest to me.

I shall first of all refer to the diagnosis. It will be observed that most of the patients when admitted to hospital, either were insensible or were in a dazed condition such as might follow a fall or blow upon the head. In some of the cases, even where the history of a fall was clear and the evidences of injury to head were visible, it was impossible to say how far the insensibility or stupor was the result of the injury to head.

Thus J- H- (Case VIII) had been subject to epileptic fits for 30 years, and it was while he was in a fit that he fell and injured his head; he received two scalp wounds, and he was unconscious for an hour

after the fall. In this case it was impossible to say whether the insensibility was altogether to be accounted for by the epileptic fit, or if it was in part due to concussion.

Again F- B- (Case XI) and R- K- (Case XII) had received injuries to the head, and were drowsy on admission; each had been under the influence of liquor when he met with the accident. They made speedy and perfect recoveries. Probably in these two cases the drowsiness was largely due to alcoholism.

W- McM- (Case XXIII) fell down a flight of steps when he was drunk, and after two days' residence in hospital he developed symptoms of delirium tremens. It is difficult to say what part injury to the brain from the ~~was~~ fall played in this case. While in the hospital he had rather the appearance of a man sleeping off the effects of a heavy bout of drinking than of one suffering from injury to the brain; but the delirium tremens may have been brought on by the accident.

Although in these cases there was difficulty in saying how far the symptoms were to be attributed to concussion of the brain, there was no doubt about the proper treatment. Acting on the

principle that every patient who is insensible or even only drowsy after a possible injury to head, ought to be watched, such cases were at once taken into hospital. The diagnosis may for a time be doubtful, but there is but one line of treatment. These are not the cases in which one is likely to make a mistake; the necessity for watching and waiting is recognised at once.

But there were others of the cases which were much more puzzling when first seen, and in which mistakes were made.

When Mrs W- (Case II) was seen in the receiving-room the nature of the case was not suspected. I did not recognise the aphasia; the patient had a somewhat vacant stare and look, and when spoken to she muttered in an unintelligible fashion; my impression was that she was not sane, and I admitted her fully expecting that in a short time I would have to send her to an asylum.

I had not previously seen a case of compression from haemorrhage, so that my knowledge was not such as to enable me to appreciate the symptoms. Even after the convulsions occurred compression was not at first thought of. The question of uraemic

convulsions was raised, as the urine contained a large quantity of albumen, and there was a history of 'fits' at one time during childbirth. By and by the paralysis of right side of face, along with the mode of development of the convulsive seizures, indicated that the case was one for the surgeon.

This proved a most instructive case. A study of the post-mortem results in the fatal cases recorded here shews that the anterior part of the temporo-sphenoidal lobe is the part of brain most apt to be lacerated; along with that part the lower and posterior part of frontal lobe may suffer; but even if this latter part is not directly affected, when blood begins to accumulate, the pressure will tell first of all on that part. So, if the lesion is on left side of brain, aphasia will be the first symptom of compression in these cases.

Another case in which the cerebral lesion was overlooked at first was that of W- M-(Case XX). This case was sent to hospital as one of fractured ribs, and when he was admitted there was no thought of head mischief. The man was somewhat stupid, and could not give a clear account of how he had met with the accident, but the significance of this was not noted at the time. This was a case in

which a serious mistake might have been made; it was regarded as one of fractured ribs, and had there not been evidence of puncture of the lung, the patient might have been sent off to lie up at home. On the following morning there was partial aphasia and this directed attention to the head condition.

These two cases resembled each other in many respects. Both patients were able to walk to the ward. In Case II the only external wound was very trivial; in Case XX there was no external wound. In Case XX the anterior end of left temporo-sphenoidal lobe was found post-mortem to be lacerated, and it is probable that the lesion was a similar one in Case II. It is likely that in Case XX even on admission the blood clot extending upwards from the temporo-sphenoidal lobe, was beginning to press on the motor centre for speech; this had taken place by the following morning at any rate; and Case II was undoubtedly at this stage when admitted.

It is in cases like these, where there is a slowly accumulating haemorrhage following laceration of brain, that one is apt to overlook altogether, or else to minimise the serious character of, the injury to head. They illustrate the truth of the dictum

'that no case of head injury is so serious as to be despaired off, or so trifling as to be made light of;' and they shew how cautious one should be in giving a prognosis.

Another case that presented some difficulty at first was J- C- (Case XXII), an old woman of 82 years. She had been badly battered about the head, had received three very deep scalp wounds, and had lost a lot of blood. On admission she was in a dazed condition and could not tell about the assault; but, I thought she might be in her dotage, and was not sure how much of the mental dulness to attribute to injury. The patient's friends, however, afterwards said that she had been quite intelligent before the assault; and marked symptoms of cerebral irritation soon set in.

The cases which were operated on, and the post-mortem examinations bring out some interesting points regarding the seat and nature of the injury to brain resulting from blows or falls upon the head. Four cases were trephined; two of these recovered. Six cases died within two weeks after receipt of injury, and one died a year afterwards; post-mortem examinations

were obtained in all these fatal cases.
A study of these results proves that serious damage may be done to the brain without the skull being fractured, and even without the presence of a scalp wound to shew that there has been any injury to the head. Thus in Case XX there was laceration of the left temporo-sphenoidal lobe, which proved fatal, and there was neither scalp wound nor fracture of skull; and in Case II, already referred to, there was but a very trifling scalp wound.
Case VI is a striking and peculiar one; here the symptoms pointed to laceration of the brain, and the mental dulness which followed and persisted so long pointed to laceration of the frontal region. The convulsions which immediately preceded patient's death a year later, may have been a remote effect of the injury to brain. At the post-mortem examination changes were found, which were regarded as evidences of a very extensive laceration of the frontal and temporo-sphenoidal lobes. It is surprising that patient survived such an amount of damage to the brain. In this case also there was no fracture of the skull.

As regards the mode of production of injury to brain we find that out of the 9 cases in which there was an opportunity of verifying the diagnosis of laceration either on the operating table or in the pathological room, the brain was injured by contrecoup in 7 cases; and in 2 only was the laceration directly under the part of head which received the blow. In Case VI, that mentioned above, the probability is that patient fell on the back of his head, and that so the brain was jolted forwards and the frontal lobes bruised.

In Case II there was a scalp wound over the right side of occiput, and there was compression of the motor areas on the left side from haemorrhage.

In Case VII there was a fracture beginning in the left parietal region and extending into the base; here the right frontal lobe was lacerated.

In Case X the fracture extended from the right parietal region into the base, and here the left frontal and tempero-sphenoidal lobes were lacerated.

In Case XIV Broca's lobe was lacerated, and the fracture was found in the right occipital region.

In Case XX, in which there was laceration of the anterior part of the left tempero-sphenoidal lobe, there was no fracture nor indication where the

head had been struck, but the analogy of the other cases points to a like cause of the laceration in this one.

In Case XXII there was the same lesion of the left temporo-sphenoidal lobe, and there was no fracture; but in this case there was a severe scalp wound over the right parietal eminence. This wound, as well as the two on forehead, was supposed to have been caused by a weapon such as a crowbar. It is possible that the blow dealt by this weapon started the movement of the brain which brought it into violent contact with the sharp edge of bone bounding the middle fossa on the opposite side.

In Cases V and XVII the laceration of brain took place on the side on which the blow was struck. In both the injury to brain was caused by the force of the blow, not by fragments of bone being driven in. Even in Case XVII where the fracture was a comminuted one of the left parietal, there was no wound of the dura mater; but there was considerable laceration of the motor areas.

In Case V the fracture began in the left parietal bone, and the left parietal lobe was lacerated.

Something is also to be learned from these cases regarding the part of the brain most likely to be lacerated.

There were 9 cases of undoubted laceration, but we leave out of consideration just now the two cases in which the laceration was directly under the part struck. Of the remaining 7 cases in 2 (Cases XX and XXII) there was laceration of the anterior end of left temporo-sphenoidal lobe only; in a third (Case II) which recovered, this was the most likely lesion. In 2 cases (VII and XIV) there was laceration of part of frontal lobe only; and in other two (Cases VI and X) there was laceration of both frontal and temporo--sphenoidal lobes.

The frequency of lacerations in these parts is explained by the irregular surface of the skull on which these parts rest, viz, the anterior boundary of the middle fossa with its prominent upper edge, and the convex irregular floor of the anterior fossa. In the majority of cases the part injured is either the anterior end of the temporo-sphenoidal lobe, or the posterior end of the lower frontal convolutions, or both together. Hence if the motor areas are subjected to pressure, and the symptoms of

compression set in gradually, the face will be first affected, then the arm; if the lesion is on the left side aphasia will precede these.

In the cases recorded here it is strange that a lesion of the left side of brain was much more frequent than of right side. In 5 cases of Excoriation by contrecoup the lesion was on the left side; in only one such case was it on the right side; in the seventh case (VII) the whole frontal region seems to have suffered. Probably this preponderance in favour of the left side was purely accidental. I do not know of any reason why the left side of brain should be injured more often than the right; the right side of head is as liable to receive a blow as the left side, and the part of head struck determines the seat of lesion in brain.

It is noteworthy, as indicating the most common cause of haemorrhage, that in none of the cases recorded here was there compression from rupture of a meningeal artery; the haemorrhage was in every case sub-dural.

It is interesting to note the different ways in which these cases of laceration terminated.
In two cases (V and X) death took place within twenty-four hours, the patients being deeply comatose on admission and remaining so; no convulsions occurred in either case. In Case V death was no doubt due directly to the injury to brain, as there was no effusion of blood; in Case X there was a large amount of blood both over the left hemisphere and over the base of brain; the compression thus produced would cause death.
In Cases VII and XX there were localizing symptoms, and on trephining a large quantity of blood was evacuated in each case; both patients died however, one four days, the other five days, after the receipt of injury. In Case XX death was due to the pressure exercised by the haemorrhage; we infer this from the fact that patient was conscious for a day or two after admission; the operation gave temporary relief, but soon after it the pressure seems to have increased again Case VII walked a short distance after the accident, and then became unconscious; this was no doubt due to the pressure of the haemorrhage found at the operation. In this case patient did not improve at all after operation.

Case XIV died on the 5th day from lepto-meningitis; the cause of this was not evident as the fracture did not communicate with any of the orifices.
In Case XXII the clot did not extend beyond the left tempero-sphenoidal lobe, the motor areas were not affected and there were no convulsions. Patient died at the end of a fortnight; for a day or so before death she was comatose; at the post-mortem examination the brain was found to be oedematous, and this was probably the cause of death.
Two cases (II and XVII) made complete recoveries.
Case VI recovered from the immediate effects of the injury, but he died a year later, probably from remote effects; the clot which had formed over the frontal lobes had become organized.
The speedy improvement in the condition of Mrs W- (Case II) after the removal of a sub-dural clot was very striking. The rapid disappearance of aphasia and paralysis in a case like this forms a marked contrast to the slow improvement in cases of permanent damage to the brain by an internal haemorrhage or embolus.

Case XVII introduces us to an interesting point as

regards the prognosis in cases of head injury. Patient was a boy of 8 years; there was extensive laceration of the brain in the region of the motor areas on the left side, and as a result there was aphasia and hemiplegia. When the extent of damage to brain was seen at the operation, the case was pronounced a hopeless one. Yet patient has made a complete recovery. This case and others in the series shew that the prognosis in a case of head injury is very much more favourable in children than in adults. P- B- (Case I), aged 12 years, fell from a third storey, and H- H- (Case XXI), aged 6 years, fell from a second storey, yet these two boys after regaining consciousness were apparently none the worse of the falls, and they are now as well as ever.

The case of H- P- (IV), aged 9 years, was a somewhat obscure one. The fact that he walked home after he fell, and then became unconscious, pointed to compression from haemorrhage; yet in a week's time he was all right. Could a haemorrhage exercising pressure sufficient to cause unconsciousness be absorbed in such a short time?

In the case of W- M- (XXIV), aged 10 years, the symptoms pointed unmistakably to laceration of the brain; he

also made a very good recovery.
Do children escape with less injury to the brain, or is it that they recover readily from an amount of damage to the brain which would be very serious in an adult? We know with how little hurt they pass through the tumbles which are the lot of childhood; the immunity which they enjoy, is accounted for by their light weight and diminutive size. But one would think that these factors would not tell much in a fall of say 12 feet or more. Probably in such a fall a child would sustain as much damage to its brain as an adult would. Case XVII seems to prove that a child may recover from an injury of the brain which would almost certainly prove fatal in an adult.

I shall, in conclusion, briefly enumerate the remote effects of head injury which have been found in these cases.
Defective memory was complained of by one patient (Case XV). This man also found that he was much more easily affected by stimulants than formerly; that was also the experience of another patient (XVI).

Increased irritability of temper has resulted in two cases (XVI and XVIII), the complaint being of course made by the friends of the patients.
In only one case (XVIII) was there a complaint of defective vision; this was due to optic neuritis.
Two patients declared that they did not remember the events which immediately preceded the accident. Thus G- G- (Case XV) cannot remember going out to his work on the morning of the day he fell; and E- W- (Case XIII), who lost control of his bicycle going down a hill and was thrown against a wall, has no recollection of his dread of coming against the wall or of his efforts to avoid it.