was soft and dilatable. He pushed on, sought for the feet of the child *in utero*, turned, and rescued his patient from impending death.

Many years afterwards I was requested to visit, at midnight, a poor woman in a neighbouring village who was suffering from uterine hæmorrhage about six weeks before her expected labour. Thinking it might be *accidental* rather than *unavoidable*, I sent my pupil, whom I had carefully lectured on the principles and practice of midwifery, with instructions how to act in the suppression of an ordinary hæmorrhage. He went, and, by carrying out the usual plans, succeeded in arresting it *pro tempore*. About a week afterwards, a similar midnight message aroused me from my slumbers. It immediately occurred to me, that the case was probably one of *unavoidable* rather than *accidental* uterine hæmorrhage from malposition of the placenta, and that consequently it would be unsafe to send my pupil. The decision was a happy and providential one. The death of the patient might, in all likelihood, have resulted from an opposite course. Accordingly, despite all weariness of the flesh, I went *in propria persona*; and as I crossed the threshold of the cottage, I heard the rush of blood, as she lay floating in it in bed. I instantly seated myself by her side, ascertained the presence of the placenta at the *os uteri*, and the dilatability of the latter; and, after succeeding in my attempt to allay the woman's fears, and inspire courage by holding out her probable safety, if she would but submit to the needful management, I prepared for action. Within five minutes the child was turned, the hæmorrhage arrested, and both lives saved. The patient recovered well. From that hour, I never again employed a pupil in cases of midwifery.

P.S. The present paper is designed to supplement the one which I wrote "On the Indications for Manual Interference and other Agencies in the Treatment of Abortion" (*vide* BRITISH MEDICAL JOURNAL for July 13th, 1867). Both the series of cases challenge the attention more especially of the junior members of the profession, both with an eye to their present advantage, and as an example of the value of recording all important cases at the time of their occurrence. I feel how impossible it would be to describe the details of such histories from memory alone, still less to clothe them with the freshness of a living interest.

MEDICAL EVIDENCE IN RAILWAY ACCIDENTS.

By JOHN CHARLES HALL, M.D., F.R.C.P., F.R.C.S.,

Senior Physician to the Sheffield Public Hospital, and late Lecturer on the Practice of Medicine at the Sheffield Medical School; etc.

II.—ILLUSTRATIVE CASES.

CASE I.—*Injury to the Spine from a Fall. Partial loss of Power in the Lower Extremities. Slight Anæsthesia. Perfect recovery in Four Months.*

CASE II.—*Concussion of the Brain from a Fall. Injury to the Back: Recovery in Two Months. Symptoms in like Cases terminating Fatally.*

CASE III.—*Injury to the Spinal Chord from a Fall. Interesting Details of the Symptoms, from the Receipt of Injury to the Man's Death.*

CASE IV.—*Concussion of the Brain from a Collision on a Railway. Slight Ptosis of Right Eye-lid.* CASE V.—*Concussion of the Brain from a Railway Accident: Recovery in Three Months.* CASE VI.—

Railway Accident. Subjective Symptoms of Injury to Spinal Chord only. Subjective Symptoms apt to mislead in forming a Diagnosis, etc.

CASE I.—John C., aged 21, was admitted into the Sheffield Public Hospital, November 20th, 1866, under the care of my colleague, Mr. T. Chesman, with whom I saw him in consultation the following morning. I am indebted to our house-surgeon, Mr. Henry Brietzcke, for the following *epitome* of the case. He had fallen from a height and struck the middle of the dorsal portion of the spine. When admitted, he was confused, and complained of pain on pressing on the part where the blow had been received. There was no fracture. He had partial loss of power in the lower extremities, and could not walk. There was slight anæsthesia; for, on applying a pair of compasses to the skin of the legs, at about the normal distance apart, a few hours after admission, he could not distinguish the two points, although he could do so perfectly in the arms. The next day he was feverish; pulse 120; he was unable to pass his urine; a catheter was introduced twice a day. The urine became cloudy and phosphatic. His bowels were constipated. Pain in the back and numbness in the lower extremities continued for some weeks, as did also the inability to empty the bladder. He was kept in bed and perfectly at rest, cupped over the spine, and fed on a light and nutritious diet, and every care was taken to prevent bed-sores—a task of considerable difficulty. He gradually recovered, and left the hospital on February 4th, 1867, perfectly well. He had,

when discharged, complete command over his bladder, and could walk as well as before the accident. It will be noted that in this man the symptoms commenced at once, continued for some time, and then gradually subsided under treatment. My long hospital experience has led me to look for symptoms of injury to the spine immediately after an accident. Should a patient after an accident, be it a fall from a height, as in this man, or a collision on a railway, have no symptoms at the time, or in a few days, or a week or two, I should certainly not expect to discover them months after the accident.

CASE II.—C. F., a short muscular man, aged 40, January 1839, fell from the top of an omnibus in the High Street of Kensington. When seen, half an hour after the accident, by my friend the late Mr. Andrew Carrick, R.N., and myself, he was pale, cold, and to a great extent unconscious; pulse very feeble. When roused and spoken to in a loud voice, he answered incoherently, and relapsed into a state of semi-unconsciousness. He remained in about the same condition for nearly twelve hours; then he was very sick. The bladder had been previously relieved by the catheter. After vomiting, the skin became warmer, the pulse fuller, and he could answer questions, but still with difficulty. He had pain in the head, and great intolerance of light, and the pupils were contracted. In a day or two, he complained of pain at the upper portion of the lumbar region of the spine, which, he said, had been struck when he fell. There was a considerable bruise at this point; partial loss of sensation and motion in both legs; they were described as feeling "numb," and he moved them with difficulty. He had perfect command over the sphincters. The urine was of specific gravity 1018, slightly acid; there was no marked change of temperature in the affected parts. Leeches and hot linseed poultices were applied over the tender portions of the spine; the patient was kept in bed and perfectly quiet. In two months he was well, and able to resume his usual employment—that of a clerk in a warehouse in the City. Had this case not gone on favourably, my present experience would lead me to anticipate that such a patient would soon exhibit symptoms of lowered vitality; a gradual declining of the bodily powers—falling into a low cachectic condition of health. There is generally a marked loss of power in the legs, a shuffling walk, an inability to stand, and, if an attempt be made to rest the weight of the body on the toes, he falls forward. One foot is trailed along the ground; the sphincters lose their power; the desire to void the urine is constant, and both it and the fæces pass involuntarily, and beyond the control of the patient. The sexual power is frequently lost; there is great irritability of temper; muscular twitches on falling asleep; severe neuralgic pains; in one case impairment of the natural sensibility of the limbs; in another, an exalted degree of sensibility painful to witness. But in all such cases, as a rule, this state of things is continuous from the date of the accident, increasing in severity. We have not months of perfect health, and then the first commencement of disease of the spinal chord.

CASE III.—Thomas W., aged 38, was admitted into the Sheffield Public Hospital, August 15th, 1866, under the care of the then senior surgeon, Mr. J. F. Wright, with whom I saw the patient. He was brought to the hospital by two men who had found him on the road; the horses and cart which he had been driving having strayed home. When brought in he was insensible, but subsequently stated that "being intoxicated he had fallen backwards from the cart into a pool of water, striking his head." There was a scalp-wound about three-quarters of an inch long over the posterior part of the left parietal bone; the pericranium was not cut through; and the loss of blood had been trifling. He complained of great pain in the back of the head, and tenderness over the cervical vertebrae; the spine was stiff; and he screamed when his head was moved. His clothes were saturated with water; he was cold; pulse very feeble; he had a drowsy look; the pupils were sluggish and dilated.

August 16th. He had passed a restless night; tongue furred; pulse feeble; the pupils were dilated, but acted better to-day. He had no headache; his neck was painful. The lower extremities were numb, a needle pricking them occasioned no pain. His legs were powerless, and he was quite unable to move them in the slightest degree. The temperature of the paralysed limbs was diminished. Some reflex action was produced by tickling the soles of the feet. The bladder was distended; and the urine was drawn off by a catheter. He lay on his back. There was no pain in the dorsal or lumbar regions.

August 17th. Pulse 80; skin warm; tongue coated; no dribbling of urine. He had no power over his legs. The pain in the neck was better.

August 18th. The urine still required to be drawn by the catheter. He vomited; there was tightness over the abdomen, and twitches in the legs and thighs; the bowels acted naturally; the abdomen was tympanitic.

August 19th. The wound of the scalp was nearly healed. The numb-

ness passed over the epigastric region, and below that line sensation was deficient; no reflex action could be excited in the lower extremities; the skin over the nates was red and tender.

August 21st. Respiration appeared to be principally performed by the diaphragm, although the ribs rose a little. He could cough. When he went to sleep, the legs twitched.

August 22nd. He was placed on an air-bed. He had great thirst; was free from pain; had no command over the sphincters; but had a sensation of wanting to pass urine. Pulse 80, small; no dyspnoea.

August 23rd. He could move his legs a little, but the nervous power appeared very soon to be exhausted; he could not again repeat the effort for some time; the urine had ceased to dribble; he could strain when the catheter was in the bladder.

August 25th. The urine when drawn off was turbid and alkaline; he had more power over his legs.

August 27th to 30th. The urine was thick and ammoniacal, and dribbled away. He had pain in the neck; pulse 76; the fæces passed involuntarily.

August 30th. Pulse 78, very feeble. He complained of a darting pain over the seventh cervical vertebra.

August 31st. He had a rigor this morning, which lasted two hours. His urine still dribbled away; and the fæces passed involuntarily. Notwithstanding every care and attention, a large bed-sore had formed over the sacrum. There was reflex action on tickling the feet.

September 4th. He could move the right leg a little. Pulse 76, feeble. He complained of great sense of weakness. He took daily four ounces of wine, and some bottled porter. He had no power over the sphincters. There was slight reflex action in the left leg. The bed-sore was rather improving.

September 10th. The right leg was now and then drawn up involuntarily; tickling the sole of the left foot did not give the sensation of tickling. Skin cool; pulse 72. He had more power over his sphincter ani; and he could empty his bladder much better, and did not require the use of the catheter.

September 10th to 15th. The bed-sore was inflamed and sloughing; pulse 80, feeble. An erythematous eruption had appeared on the arms. It was arranged in large irregular circles, formed by red lines, which looked like inflamed lymphatics. In some of the patches the skin included within the circles was normal; in others, white as in nettle-rash.

September 17th. The eruption had disappeared; the bed-sore was better. He had a good appetite; no pain.

October 6th. The bed-sore was sloughy. The left leg was very painful on being moved; he could move the right leg a little.

October 16th. He was delirious; pulse 108, feeble; no pain.

November 17th. Since last report, he had at times improved a little, and again relapsed. The old bed-sore had granulated, but two others had formed over the trochanters, which were very sloughy. He had no increased power over the legs; if anything, the right was the better of the two, both as regarded sensibility and motion. The bowels were regular, and the appetite good. At times he had fearful rigors, followed by profuse perspiration. He was evidently sinking.

November 18th. On examining the back this morning, the seventh cervical vertebra was observed to be unusually prominent. At first, this was attributed to the excessive emaciation; but on taking hold of the spinal process with the fingers, a lateral motion could be produced, accompanied by a grating sound. He had no pain in the cervical region.

February 2nd, 1867. Becoming more and more exhausted, with no power over his legs, he expressed a wish to go home, and left the hospital. He died in a month from this date, his friends refusing to permit a *post mortem* examination. This case is both interesting and instructive, as showing the length of time patients may live after so severe an injury as this poor fellow had sustained. The exact nature of the injury, by which the spinal chord was affected, we were unable to verify, no examination of the body having been made after death.

CASE IV.—An elderly gentleman, travelling in a second class railway carriage, suddenly found himself at the bottom of the carriage, his train having run into some coal trucks. When I saw him, three hours after the collision, he was confused and could give me no very clear account beyond what I have already stated; that he found himself with his hat off at the bottom of the carriage; that he was helped out; how long he had been insensible he knew not, but that he sat on the bank of the railway and felt cold, and that a gentleman had lent him a rug. He had come on by train for some miles after the accident. He felt sick, and attempted to vomit; but did not bring anything from his stomach. Pulse 58, feeble; skin cold. He was put to bed; a cup of hot tea was given to him; a good fire was lighted in his bed-room; and a hot-water tin placed at his feet.

Next morning he was confused; and, when seen by myself and an old personal friend who had known him many years, he said his head ached,

and that the light from the window caused him annoyance. His pulse was 60; temperature normal; tongue furred. He had perfect command over his sphincters. He complained of pain in the head, and great tenderness along the whole of his cervical region, over which he thought he had been struck. There was no mark on the skin, nor was the part swollen. He could not read, and asked me to read a letter for him; when he attempted to read, the words ran into each other. His sleep was disturbed and broken; he awoke with a start, and was remarkably irritable, and predicted the most fearful results from the injury he had sustained. His friend informed me that some years previously he had been injured in a railway collision; that he was then for a long time unable to attend to business; and hence, probably, the disposition to look gloomily on the future. He continued in this state for several days; the exalted sensibility of the whole nervous system was most marked. When he attempted to walk he said "his legs failed him." There was slight ptosis of the right eye-lid; and the vessels of the conjunctiva on that side were injected. He almost shuddered when the eye was examined by the ophthalmoscope; and a hot sponge applied to the upper part of the spine caused him to cry out with pain. The temperature in every part of the body was normal. Dr. Fletcher, Dr. Bartolomé, and Mr. W. F. Fayell, saw the case with me. The conclusion at which we arrived was, that no permanent injury had been received; and that with perfect rest, and abstaining from business and all mental exertion, in three months this gentleman would be quite well. The case was settled out of court by the payment of £500, and the costs. I have seen this gentleman several times since. There is no ptosis, nor any single trace of the accident. He is able to carry on his business, and is in every respect quite well.

CASE V.—The Rev. J. B., aged 61, April 1867, travelling on the Great Northern Railway in a third class carriage, was looking out of the window, when the passenger train ran into a luggage train. He was violently shaken at the time, and received a severe blow on the right side of his head; his hat had been broken by the force of the blow. He was senseless for a short time, then felt sick, and reeled at first like a drunken man, but soon recovered, and proceeded up to London; and went, after taking tea with a friend, to buy a new hat. He preached on the following day (Sunday), to a large congregation, but felt often at a loss for a word; he was a good deal exhausted after service, and at once went to bed. On the following evening he commenced the first of a course of lectures, but broke down from exhaustion. He returned home to Sheffield the next day by railway, having been about five hours on the road, and immediately sent for me to attend him. He was very feeble, and spoke with difficulty; his face on the right side was partially paralysed. He could not read; the light gave him pain; and, when a candle was held to his eyes, he frowned and asked that it might be taken away. On putting out his tongue, it was seen to be drawn to the left side of the mouth, and this continued for nearly a month. He walked with great difficulty, and complained that his legs were cold; there was a constant desire to pass urine. His urine was acid; specific gravity 1019. Pulse 66. With perfect rest, and abstaining from all mental exertion, and a few weeks spent at the sea-side, in three months from the receipt of the injury, this minister resumed his usual duties and perfectly recovered. The case was settled out of court, the patient and the company having mutually agreed that the sum to be paid should be fixed by myself.

CASE VI.—Mr. —, a gentleman in middle life, had the misfortune to be riding in a second class carriage at the time of a collision on a railway. After the accident, he proceeded some distance, and at the end of his journey he was seen by the surgeon of the company. He complained of pain over the dorsal and lumbar regions, on which, he said, he had been bruised; and, in addition, of an inability to walk without pain. He returned to his home from London in a first class carriage, was immediately attended by his family surgeon, and was seen by myself for the first time seven days after the accident.

I found him in bed laid on his back. He told me "he was suffering very great pain along the whole course of the spine, and that he had not power to move his legs or even to turn in bed." The temperature of the whole body was normal. He had perfect command over the bladder and rectum; he said that at first he had "difficulty with his water, but that was improved." His pulse was 76; but as he spoke of the severe injuries he had sustained by the negligence of the company, and the heavy damages (two or three thousand pounds) that he would make the directors pay, he became very excited and his pulse rose to 98. On getting him out of bed, he was unable, he said, to walk or to bear any of the weight of the body on his feet; he supported himself by the table, and insisted on being again carried immediately to his bed. There was no mark on any part of the back. During the whole of my attendance these symptoms remained. He complained of a sensation of pins and needles in both legs; there was no reflex action; no drawing up, or starting of the legs; no wasting. As we saw him in bed, he appeared a

stout healthy man, but told us, again and again, "that he had no power over his limbs, and that he was unable to walk." In the absence of all objective symptoms, I ventured to express a very strong opinion, that no permanent injury to the spine or spinal chord had been sustained; and in this opinion three other medical gentlemen concurred. Having satisfied myself that not only could he walk without assistance, but that he had actually done so, and that, too, at the time when he assured me that he was altogether incapable of moving his limbs, I discontinued my attendance.

A gentleman of great skill and long experience was now called in, and, through trusting to subjective symptoms only, he was led to conclude that the injury to the spine and spinal chord was severe, and probably permanent.

About three months after the accident, the case was compromised by a payment by the Company of several hundred pounds. It is, doubtless, a consolation to this gentleman and his friends now to know that my prognosis was correct; and that his and their fears proved altogether groundless. Shortly after the case was settled, he was observed walking about in the street. He has almost ever since attended to his business; and no trace of the injury remains.

Some additional cases of railway accidents, and their results, will be given in an early number.

REPORTS

OF

MEDICAL AND SURGICAL PRACTICE IN THE HOSPITALS OF GREAT BRITAIN.

NORTHAMPTON GENERAL INFIRMARY.

A CASE OF ACUTE TRAUMATIC TETANUS TREATED WITH EXTRACT OF CALABAR BEAN: RECOVERY.

(Under the care of Mr. ASHDOWN.)

WE are indebted for the following report to Mr. Frank Buszard, House-Surgeon to the Infirmary.

James S., aged 33, a labourer, residing at Brixworth, was admitted October 3rd, 1867. Exactly three weeks previously, the patient, whose health till then had always been good, fell off a coal-stack, and received a wound about half an inch in length on the scalp, and a second on the left ear. He was stunned for a few minutes, but quickly recovered, and felt no further effects of the accident till seven days before admission, when he began to experience a feeling of stiffness in the neck and back, which was attributed by him to a cold occasioned by working in the rain. He remained at work till September 28th, when he was obliged to take to his bed, in consequence of the increase of the pain and stiffness, and of frequent attacks of cramp in the back and legs. He had scarcely been able to swallow any food for the last three or four days; every attempt to do so bringing on a fresh paroxysm of pain. He was bled to a pint on October 2nd.

On admission (October 3rd), the tetanic aspect was strongly marked. The forehead was permanently wrinkled, and the angles of the mouth retracted. The teeth could be separated about half an inch. The respiration was quick, and chiefly thoracic; the abdominal muscles were tense and unyielding to pressure; the back was arched, and its muscles rigid; as also were those of the legs, the arms alone being freely moveable. The skin was bathed in perspiration; and the chief complaint was of pain at the pit of the stomach. There was a slight appearance of suppuration about the wound on the left ear, but that on the scalp cicatrised. The urine was retained. Pulse 114. He was ordered to take one-sixth of a grain of extract of Calabar bean in a drachm of water every half-hour; and to have strong beef-tea, milk, eight ounces of port wine, and four ounces of brandy.

In the evening, the pulse had fallen to 94; but the paroxysms came on every few minutes, and were produced immediately by any disturbance. He had been fed by means of a piece of gutta-percha tubing passed to the back of the tongue and attached to an ordinary feeder, and seemed to have no difficulty in swallowing. His urine was removed by a catheter.

On the 4th, the patient's condition was but little altered, though the pain was not quite so severe, and at times he had been able to move his legs slightly.

On the 5th, after a visit from his friends, he was much worse; violent paroxysms coming on every few minutes, and the muscles appearing even more rigid than previously. The pupils were rather dilated, and freely influenced by light. The dose of the extract was increased to one-third of a grain, and the wine and brandy doubled in amount.

October 6th. He had vomited several times, and was not in the least improved. The medicine was stopped, and one-third of a grain of extract of Calabar bean, dissolved in eighteen minims of water, ordered to be injected every two hours under the skin. The effect of the first subcutaneous injection was very marked. In about five minutes, the legs, which had been previously perfectly rigid and immoveable, became flaccid and freely moveable by the patient; the abdominal muscles became less tense; and the arching of the spine disappeared. The pupils also contracted, and the pulse sank to 82. The effects lasted between two and three hours, and all the symptoms then reappeared. Beef-tea and brandy enemata were ordered to be used every four hours.

October 7th. The vomiting had been less frequent, but had not entirely ceased. Every subcutaneous injection, which had been given regularly every three hours during the night, had been followed by an almost complete remission of the symptoms, lasting for about two hours. In the evening, each dose was increased to half a grain.

October 8th. He had passed a restless night, though he had not been in so much pain, and had for the first time been able to dispense with the aid of the catheter. Vomiting had ceased; and several eggs had been taken, beaten up with wine. The beef-tea and brandy enemata were therefore omitted. Eggs *ad libitum*, and a bottle of sherry daily, were ordered. The dose of extract of Calabar bean was increased to three-fourths of a grain in each injection, to be given at intervals of two hours only, or as soon as the effect of the previous injection had passed off.

October 9th. The injections had been continued every two hours, and their influence in preventing the muscular rigidity and spasms remained unabated; the only muscles not perfectly relaxed were those of the abdomen and back. The pupils were much contracted, and the patient had been at times very delirious. He continued to take plenty of nourishment. The urine contained a large quantity of phosphates. As the injections occasioned much pain and inflammation in the cellular tissue, and the solution was found to be acid, a few drops of liquor potassæ were added to it. The solution thus obtained was more perfect, and produced less pain.

October 10th. During the night, as the patient was very delirious, and the pulse had risen to 148—effects supposed to depend on an over-dose of the medicine—the injections were stopped for seven hours. This morning the vessels were as rigid as ever; and the paroxysms, which had almost ceased, again increased in frequency. The injection was ordered to be continued as before. In the evening, the pulse had fallen to 125; but the injections had been required every two hours, the effect not lasting so long as previously.

October 11th. The dose was increased to one grain at similar intervals.

October 12th. One-third of a grain of morphia was ordered to be injected subcutaneously every night with that of Calabar bean; as the latter, notwithstanding its influence in subduing the spasms and rigidity of the muscles, did not secure sleep, and the night had been restless and disturbed.

October 13th. He slept well all night after the morphia injection was given; and this morning there was a marked improvement. The pulse 94; the countenance flaccid, and not expressive of suffering; the muscular rigidity less; and paroxysms infrequent. He took twelve eggs and two bottles of sherry in twenty-four hours.

October 15th. As the skin was becoming tender from the numerous injections, and the severity of the disease was evidently subsiding, they were omitted, and suppositories containing a grain and a quarter of extract of Calabar bean were ordered to be applied every two hours; the morphia to be continued every night.

From this time, the patient gradually improved, the suppositories acting very favourably; but it was not until November 1st that all the rigidity of the muscles had finally and permanently disappeared, and convalescence was established. Up to this time, the suppositories had been continued, though at gradually increasing intervals. A few small subcutaneous abscesses formed at the sites of some of the injections, but they gave little trouble; and he was discharged well on November 30th.

REMARKS.—The result of this case—which, though not, perhaps, of the acutest type, was one of very great severity—shows that the plan of treatment adopted is deserving of a more extended trial; for, though the Calabar bean does not appear to exercise any direct curative action in the sense of cutting short the disease, it is impossible to doubt its influence in controlling the more urgent and dangerous symptoms. The superior advantages of the hypodermic method of administering the extract of Calabar bean were in this case very obvious; for in this way relaxation of the spasmodically contracted muscles was very rapidly and invariably produced, even when the dose was extremely small; while, when administered by the mouth, only a large dose exercised any obvious influence, and its further continuance was contraindicated by the