other morbid appearance, besides the softened cord, which the *post mortem* examination revealed, was of a character that is usually associated with, and implies, a constitutional cachexia or nutrient derangement, viz., a waxy and fatty liver. But this condition of liver cannot be taken as evidence of a pre-existing cachexia. It may have been the result of nutrient changes consequent on the local disease. Fatty liver is very often seen independent of phthisis, but, so far as my observation goes, usually in connexion with such conditions as imply impaired oxygenating power of the lungs. Now, although in the present case the immediate cause of death was not, as often happens in similar cases, from paralysis of the diaphragm and respiratory muscles, yet there was considerable and protracted impairment of the respiratory process. There was very imperfect action of the lungs, as indicated by the breathing, and the collection of pulmonary secretion, giving rise to short, frequent, and ineffective cough, which led us frequently to examine the lungs carefully, and to suspect that tubercular disease might exist. But I could never detect evidence of anything more than what was subsequently proved by the *post mortem* examination, viz., a loaded state of the bronchial tubes. This condition of lungs, which gave rise to one of the most troublesome and distressing symptoms, must have seriously interfered with their oxygenating function. Thus, during a protracted illness, in which emaciation and waste of tissues were continually going on, the blood would probably become loaded with oily matters, which might be deposited in the liver. At all events, it is in such circumstances that we most frequently meet with fatty liver.

But, even assuming that the local disease of the spinal cord was the consequence of some constitutional derangement, what was the nature of the local change? Was it the result of inflammation? This again is a question of great practical importance. The few scattered compound granular cells distributed through the softened portion, together with the colour and general appearance, would be considered by many persons as decisive of the inflammatory origin of the change. I will not stop to inquire how far these appearances are or are not sufficient to justify such a conclusion, nor to discuss what we are to understand by the term inflammation. But I must beg special attention to the absence of all signs of surrounding congestion, effusion, swelling, or thickening, and of the least implication of the meninges. The surrounding arachnoid was perfectly smooth and natural; nor was there the least fibrinous effusion about the coverings of the cord, or anything, in the cord itself, above or below the softened part, which could indicate inflammatory action. It is therefore, I think, tolerably certain that, if the softening had its origin in inflammation, it was not of a character that would render it probable that it would be amenable to ordinary antiphlogistic remedies. Neither was there anything revealed by the *post mortem* examination that would lead to the suspicion that the local change was of a scrofulous or tubercular character.

You will have noticed that, in the treatment of this case, I neither employed any very vigorous antiphlogistic remedies, nor mercury, to the extent of affecting the system. The first symptoms of paralysis having occurred a month previous to the man's admission to the hospital, I did not think it probable that the disease, whatever might have been its original nature, would be benefited by depletion, or other vigorous antiphlogistic means. And, as regards mercury, I confess that my experience has led me to be very cautious in its use in such cases. I grant that there are cases of paraplegia, whether resulting from violence or independent of it, in which mercury appears to be of decided utility; and that the diagnosis between these and such cases as the present is not always easy. And it is observable that, in the present instance, the occurrence of a certain amount of pain, and of excito-motory phenomena, did not depend on any implication of the coverings of the cord in the inflammatory action, if such it were. Yet these are the cases in which mercury is most frequently of use. Blisters, purgatives, alteratives, with sedatives, if necessary, to allay pains and spasms, and finally nerve tonics, are of most use.

Time does not allow of my entering on the diagnosis of the various forms of even those varieties of paraplegia which depend on centric disease. Let me, however, beg attention to the extensive sloughing of the integuments in this case, as showing the intimate connexion between the function of nutrition and the nervous power derived through the spinal cord. The functions of digestion, secretion, and excretion, were maintained for a long time in tolerable integrity, being chiefly dependent on the sympathetic system. But sloughing of the integuments occurs very early in this, the most hopeless form of paraplegia. I have seen extensive sloughs form in the course of eight or ten days from the first occurrence of the paralytic symptoms. It is important to be aware of this, not only as an aid to diagnosis, but also that you may be early on the look out for its occurrence, and adopt the requisite means for preventing it as far as possible.

The peripheral or eccentric phenomena, in cases of paraplegia, vary considerably, and, however slight in appearance, are deserving of notice. Some of the first symptoms in the present case were of this class, viz., pains of a rheumatic character in the limbs, felt chiefly on attempting exercise, and to a certain extent relieved during and by exercise, although subsequently aggravated. Such pains are not unfrequently mistaken at first for rheumatism; and it is not till some want of power of the bladder, or other unequivocal symptom, is developed, that the true character of such symptoms, referrible to the peripheral extremities of the nerves, is recognised. The abdominal pains subsequently complained of by Saunders were of a similar character. Now, it is important to observe, that such pains, and even spasmodic action, whether of a tonic or clonic character, are by no means most severe in the most serious forms of paraplegia. On the contrary, such phenomena are sometimes most marked in cases where the meninges are chiefly implicated, and which, for the most part, are far more amenable to treatment than such a case as we have been considering. Let me also caution you not to be deceived by the patient's description of subjective phenomena into the belief that recovery is taking place. When our patient talked of returning sensation in his legs, of "feeling that he had legs", he was in fact but illustrating what is seen after the amputation of a limb, when pain or irritation of the stump is referred to the toes of the lost limb.

THE MODERN TREATMENT OF FRACTURES.

By BENJAMIN HUNT, Esq., Surgeon to the General Dispensary, Birmingham; late Resident Surgeon to the Queen's Hospital.

[Continued from page 624.]

CASE XV. G. W., aged 44 years, a robust man, broke both bones of his right leg by falling in the street during a hard frost. The accident occurred in the night, and he lay on the ground for three hours before he could obtain assistance to carry him home. He was brought to the hospital on the 27th of December 1853, ten hours after the receipt of the injury; the limb was livid from cold, and swollen, measuring two inches and a half more round the calf than the other; the fracture was rather below the middle of the tibia, and oblique; the upper fragment was prominent under the integument, its sharp extremity threatening to protrude; the inferior fragment was drawn upwards by the muscles, causing much displacement. To assist in bringing the broken ends into apposition, the man was placed upon his back, his thigh flexed upon his body, and his leg upon his thigh; a fold of lint was next laid along the shin, and the leg was bandaged firmly, commencing from the toes, gradual and steady extension being kept up at the same time, until the bandage had been

applied as far as the knee; the limb was now brought into a straight or extended position, and the bandaging continued to half way up the thigh; the leg was now as long as its fellow, and without deformity. The millboard splints employed in this case were three in number, one posterior and two lateral—the former from the back of the heel, and the latter from the sides of the foot reached as far above the knee as the bandage had been carried. These having been applied in the usual manner, two light wood splints were carefully adjusted, one on each side of the leg, during the drying of the apparatus. They were removed in about forty-eight hours, and the limb very cautiously examined by cutting open the apparatus; the swelling had so much diminished, that it became requisite to use several folds of lint to obtain an accurate support with the apparatus. The bones were in good position; the apparatus was closed by a starch bandage; and the patient had permission to leave his bed, which he did the day following.

On the 16th January 1854, twenty days after the accident, he was discharged from the hospital to come as an out-patient, the apparatus being previously shortened to set the knee-joint at liberty. At the expiration of six weeks, the bones had united firmly, and in so good a position, that it was difficult to detect the exact seat of fracture; but as a precaution, he wore the apparatus a fortnight longer.

REMARKS. The severity of the injury and the rapid cure without deformity sufficiently indicate the excellence of the method of treatment; and the absence of bony deposit about the seat of fracture is significant of the complete support afforded the injured limb by the apparatus—it being now an established fact that provisional callus is not essential to the union of fracture, but only an expedient of unassisted nature. Of this, I shall have to speak further on a future occasion.

CASE XVI. Henry Robins, aged 34 years, was admitted into the Queen's Hospital on Christmas Day 1853, having half an hour previously slipped down on the frozen street, and fractured both bones of his right leg. The tibia was broken nearly transversely at the junction of its middle and lower third, the fibula near its head. The limb was immediately encased in the millboard apparatus from the toes to half way up his thigh, the whole process taking just twenty minutes. The patient suffered scarcely any pain during the application. The apparatus was cut open on the third day, and the limb having been examined, the edges of the case were pared sufficiently to allow for the size of the leg, diminished by the subsidence of swelling; they were then brought together, and retained in apposition by a bandage. He was from this time permitted to leave his bed daily, and went upon crutches. At the expiration of three weeks he left the hospital, to attend as an out-patient. The bones were then in perfect apposition; a slight thickening only indicated the seat of injury. The apparatus was removed from the thigh and knee, to give liberty to that joint, but retained upon the leg for three weeks longer.

CASE XVII. Mrs. Bell, aged 59 years, suffered simple oblique fracture of the tibia three inches from its lower end, and fracture of the fibula. She was rather intoxicated when brought to the hospital, April 17th, 1853, immediately after the occurrence of the accident, and had been roughly handled. She attributed the injury to a fall, caused by stepping upon a piece of orange peel. Coaptation of the fragments having been satisfactorily effected, the limb was put up in the millboard apparatus in the usual manner, but it was first enveloped in cotton wool: it was also deemed advisable, because of the condition of the patient, to employ wooden splints until the casing had become dry. The leg about the seat of fracture, when examined on the third day, was deeply ecchymosed, and there were several large vesicles filled with serum. The swelling, which on admission was considerable, had now altogether subsided; the vesications, therefore, could not have arisen from constriction by tight bandaging, but probably from the interposition of the wool between the

skin and the apparatus, preventing both the free transmission of heat and moisture, and the cooling influence of evaporation during the drying of the apparatus. By bestowing a little extra care and attention, a satisfactory union of the bone was effected, and without any deformity, in six weeks.

CASE XVIII. George Clark, aged 16 years, broke both bones of his leg, August 13th, 1854; the tibia transversely rather above its middle, and the fibula near its head. The apparatus was immediately applied; the leg was not then swollen, and did not swell afterwards; the casing, therefore, did not require opening for the examination of the limb; and as he did not complain that it gave him pain or uneasiness, he continued to wear it for a month, when it was removed, the bones being firmly united without any deformity.

CASE XIX. Thomas Dale, aged 17 years, sustained oblique fracture of the tibia three inches above the ankle; the upper fragment projected forwards, and the lower was drawn upwards; the fibula was broken higher up; the limb was shortened. He was taken to the hospital on September 30th, 1853, shortly after the receipt of the injury, and the apparatus was immediately applied. Firm union had taken place when he was discharged, on October 22nd, 1853.

CASE XX. Mrs. S., aged 50 years, while coming out of her house, slipped over the door-step and broke both bones of her leg transversely. The fracture was situated between the middle and lower third of the tibia and fibula; there was no shortening, but some deviation outwards of the leg, below the seat of injury, with eversion; also some effusion of blood into the surrounding structures. The accident occurred on the 14th of March 1854, and the apparatus was applied as soon as possible. She sat up on the third day, and recovered the use of her leg at the end of six weeks; union had taken place a fortnight previously.

CASE XXI. T. W., aged 47 years, a fishmonger, was admitted into the Queen's Hospital, March 30th, 1854, with transverse fracture of his patella. The injury occurred while he was endeavouring to save himself from falling backwards, on the day previous to admission. The swelling was considerable. The apparatus employed was similar to that described for the treatment of a broken femur, with the exception that less care was taken to control the movements of the hip-joint: yet, it should be remembered that, the rectus femoris being attached to the ilium, the patella would be influenced by free movement of the thigh. The fragments of the patella were approximated, due regard being had to the position of the limb during the application of the apparatus, and its subsequent drying. In forty-eight hours the patient was allowed to leave his bed, and to go about on crutches, with the foot in a sling from his neck. A month was allowed for union of the broken patella, and then the apparatus was modified, to give free movement of the ankle and hip-joints; it was not completely removed until the 25th of May. The fragments were then in close apposition; but a knee-cap was provided him, to prevent too free motion of the joint until the muscles had regained strength.

I saw this man on the 16th instant, more than fifteen months since the accident. He walked well, but stated that the limb was rather weaker than the uninjured one: the fragments of the patella could be moved one upon the other; the upper was oval in shape, the lower semilunar; they were less than a quarter of an inch apart; the union, however, was ligamentous.

CASE XXII. J. W., aged 31 years, a bricklayer, fell from a scaffold a distance of about three yards, and alighted on his feet upon some loose bricks; but his right foot turning inwards, he came also with his right side upon the ground. Much pain, with loss of the use of the ankle, immediately ensuing, he was conveyed home, and had hot fomentations applied until the following day, when, his sufferings not having abated, he was taken to the Queen's Hospital.

On admission, October 10th, 1853, twenty-four hours after receipt of the injury, the right foot, ankle, and lower half of the leg, were much swollen; the skin was hot, tense, and shining; and he suffered severe pain. The foot had an in-

verted appearance, due to the amount of swelling being greater on the outer side of the ankle than the inner. The fibula was broken close to the malleolus. The apparatus was applied to the foot and leg, terminating below the knee. He experienced immediate relief of the pain, and the swelling rapidly subsided; so that, on the third day, the apparatus had to be cut open, and pads of lint inserted between it and the limb, to render the support uniform: the apparatus was readjusted, and rendered perfect by starch and bandage. He was made an out-patient, being able to go about on crutches. At the end of three weeks, satisfactory union of the fibula having taken place, the apparatus was removed, and a bandage simply applied instead.

REMARKS. The amount of injury to the bone was not great, and the patient would probably have made an equally good recovery if treated by rest and antiphlogistic remedies, but certainly not so expeditiously. He could not have left his bed in forty-eight hours, to superintend the management of his affairs, without suffering pain or retarding his cure, by any other method of which I am aware; nor does my experience suggest any means by which inflammation and effusion are so readily controlled after injuries of this kind.

CASE XXIII. William Sherriff, aged 30 years, was admitted January 9th, 1854. He had slipped on the ice, and, endeavouring to save himself from falling, he came with much force upon his right foot, breaking the outer malleolus, and dislocating the foot outwards. As he was seen directly after the accident occurred, there was neither so much swelling nor inflammation as in the preceding case. The fractured end of the fibula was prominent beneath the integument, which was drawn tensely over it; the foot was inverted, and the astragalus turned outwards. The displacement was reduced in the ordinary way, and then the apparatus was applied. Within twenty-four hours after the receipt of the injury, he was going about on crutches, and required no farther assistance for three weeks. When the case was cut open and the limb examined, it was found perfect in appearance; the ankle-joint was somewhat stiff and weak; the apparatus was therefore re-applied, but altered about the foot, so as to allow of limited flexion and extension being made. A fortnight afterwards, he was able to use the leg tolerably well; the apparatus was therefore removed.

CASE XXIV. Edward Pattison was admitted December 29th, 1853, with transverse fracture of the inner malleolus, of recent occurrence. Swelling, more especially on the outer side of the ankle-joint, was very considerable; nevertheless, the apparatus was immediately applied. Absorption of the effused fluids took place with rapidity, so that in forty-eight hours padding with lint was required to supply its place. The man left the hospital on the ninth day, and had the apparatus removed at the end of the third week.

CASE XXV. George Hunt, aged 35 years, a bargeman, fell a distance of six or seven feet, and, coming with much force upon his right foot, sustained a fracture of the fibula at its lower third. The foot was dislocated inwards, the outer margin being turned upwards, and the sole outwards. The dislocation was readily reduced; but, if uncontrolled, speedily returned. The apparatus was at once applied, and a splint to the inner side of the limb, to keep the foot steady until the apparatus had become dry. He was made an out-patient on the seventh day, and discharged as cured three weeks afterwards. He regained perfect use of the limb in about a month.

CASE XXVI. Mr. B. P., aged 51 years, a builder, met with dislocation of his right foot outwards, with transverse fracture of the external malleolus, on the 1st day of May 1854. He was a stout man, weighing fifteen stone; and an arch of brickwork on which he stood gave way, letting him through: he fell a distance of about two yards, and alighted chiefly upon his right foot, which turned inwards with the force of the collision.

When I saw him, almost directly after the accident, his

foot was inverted nearly to a right angle with his leg; the outer malleolus was broken across, the fragment being detached by a considerable interval; the integument was drawn tightly over the fracture. Replacement of the foot was attended with an audible snap: the apparatus was then applied. He made a good recovery in a fortnight.

CASE XXVII. N. P., aged 56 years, was admitted August 4th, 1853, with fractured fibula, caused by some bricks having fallen upon his leg. The limb was much contused, but the integument not injured. The apparatus was applied without delay. He left his bed forty-eight hours afterwards, to go on crutches; he was made an out-patient on the fourteenth day; and the apparatus was removed at the end of the third week.

CASE XXVIII. Jeremiah Allsopp, aged 45 years, a cabman, was brought to the hospital January 25th, 1853, his horse having fallen upon his arm, causing compound fracture of the radius four inches from the wrist, and simple fracture of the ulna at the same place. The wound having been closed with plaster, the forearm and hand were placed at a right angle with the arm, and midway between pronation and supination. The apparatus was then applied, including the hand, and reaching up to the insertion of the deltoid. The wound healed by the first intention, and the fracture united firmly in the course of a month, when the apparatus was removed, and the man discharged from the hospital. He regained the use of his arm fully. In this case, the absence of any provisional callus was from the position of the bones appreciable to touch.

CASE XXIX. T. D., aged 35 years, fractured his olecranon by a fall upon the elbow, May 17th, 1854. The whole extremity, from the axilla to the tips of the fingers, was encased in an extended position, and kept so for three weeks. The apparatus was then removed, and passive motion of the joint employed for a week longer. Union appeared to have taken place satisfactorily; and, during the time the patient was under my observation, there seemed to be no tendency to separation.

[To be concluded.]

Birmingham, July 1855.

INFANTILE PARALYSIS.

By GEORGE TERRY, Esq.

On May 24th, 1855, at 8 A.M., I was summoned hastily to see a child that was said to have fallen down and broken its thigh. I went immediately, and found a very healthy looking boy, aged 2 years, lying in his mother's lap, with his right thigh and leg hanging down lower than the other, and motionless. On examining the limb, I found that there was free passive motion of all the joints, and without causing any pain; but the child would not attempt to put the limb to the ground, or bear any weight on it. The relations were so frightened that I could not learn anything definite as to the accident, but that he had fallen down on a brick floor. Thinking he had probably bruised himself, and was frightened, I merely directed the limb to be fomented, and the child kept in bed.

May 25th. The limb was still powerless, as were also the right arm and hand. This was noticed soon after I left yesterday; and the child did not seem to eat with the right side of his mouth. There was slight swelling of the right cheek; there was very little difference in the direction of the eyes; but he hung his head towards the right side. No difference was perceived in the temperature of the limbs; but the right leg felt less firm than the left. The child had not spoken yet; he was peevish and fretful; and had passed rather a restless night, but showed no other signs of ill health whatever. On inquiring minutely into the alleged accident, I found there had been no fall, the idea having arisen from the child having been found lying on the floor; but he had been seen, a few minutes before, crawling along on the brick floor, as he was often in the