spond with the larger afferent. The loop is then well wrapped in sterile gauze, and removed by scissors cutting along the mesenteric border and obliquely across the two tubes, so that the free margin of what is left is shorter than the attached. The two adjacent open lumina are then wiped dry with sterile gauze, and mopped with 1 in 1,000 sol. hyd. bichlor. and later with saline solution. The ends are then united without removing the forceps, as described in Case II. Murphy's button, of course, may be employed, but after a considerable experience of it I must say I have more faith in silk suture. Before dropping the sutured bowel back into the abdomen, the exposed portion should be gently washed with saline solution, and carefully dried. In all these manipulations every kind of irritation of the gut or peritoneum with strong germicides must be studiously avoided. If they are used at all it should only be to the cut edges of the bowel. As to whether the abdominal wound should be closed or drained, it is quite impossible to lay down rules. In Case I it was stuffed with iodoform gauze for a few days, and then allowed to granulate up; in Case II I did a radical cure by Bassini's method at once. But in the last case the sac was not in a state of gangrene as in Case I.

(c) *The After-treatment.*—I venture to think that hypodermic transfusion of saline solution twice a day to the extent of a pint or so each time is an important factor in after-treatment, and it has proved of great use in many of my other abdominal cases. Nutritive enemata every four hours, and hot water enemata every four hours, alternating with the last, have for many years been a routine treatment in all my case of abdominal operation. But in these special lesions I believe that cautious feeding by the mouth may be begun at once.

All these factors require to be carefully taken into account and provided for before the operation is begun to obtain the best results. Where many of us have made the most serious mistakes in the past has been in the too free use of strong germicides on the peritoneal surfaces, and in removing too little of the intestine.

FRACTURE OF THE SPINE IN THE LOWER DORSAL REGION :

OPERATION FOUR YEARS AND A-HALF LATER : PARTIAL RESTORATION OF WALKING POWERS.

By NOBLE SMITH, F.R.C.S. EDIN., L.R.C.P. LOND.,

Senior Surgeon to the City Orthopædic Hospital, and Surgeon to All Saints' Hospital for Children, London.

E. W., aged 22 at the time of the accident, was training in the West Cumberland Hussars on June 1st, 1893, when his horse reared, fell back, and crushed the rider, who was also dragged for some distance, one of his legs being retained in the stirrup. He remained paralysed from his waist downwards. I first saw him in August, 1896, three years and two months after his accident. He was then at the Home for Incurables at Carlisle, and was in a very weak state of health. There was an acutely angular projection of the tenth dorsal vertebra. He had very slight power of flexing the left thigh upwards as he lay in bed, but the lower limbs were absolutely useless to him. There were several bedsores, which had commenced a few months after the accident and had continued more or less since, and other symptoms of paralysis which I will describe later. It was obvious, from the fact of his having lived so long, and of their being some movement in the left leg, that the cord was more pressed upon than crushed, and I suggested that laminectomy, to relieve that pressure, was desirable.

The patient was very anxious to have everything done that could be for him, but for various reasons he was unable to come to London until January, 1898, when he was admitted a patient under my care in the City Orthopædic Hospital, Hatton Garden. His condition was then found to be as follows :

There were several old scars from bedsores, as well as the open sores. Complete anæsthesia and analgesia of the whole of the right inferior extremity, with the exception of the upper third of the front of the thigh, where the patient detected both touches and pricks. Sensibility was not so much affected on the left side, the patient being able to detect touches and pricks above the level of the knee, both in front and behind,

and over a limited area below the knee, in front and on the inner side of the leg. Below this level there was complete anæsthesia and analgesia. There was no blunting of sensibility of the trunk, the muscles of both limbs were greatly wasted, and there was considerable contracture of the calf muscles, both feet being extended and the heels drawn up. There was also some amount of "varus," especially on the left side, and the toes were bent towards the soles of the feet. This contracture of the toes in the flexed position had been more marked on the right side than the left, and most marked in the great toe, but diminished in degree towards the little toe. There was complete inability to move the toes of either foot or the feet at the ankle-joints. The right leg could be slightly drawn up in bed, flexion at the hip and knee-joints thus resulting, but there was no power of extending the limb at the knee-joint, so that the heel could not be raised from the bed. The power of movement, which was preserved in this limb, was only very slight in degree. There was somewhat greater range of power of movement on the left side, shown by ability to draw up that limb in bed, flexion of the hip and knee resulting. There was slight power of extension at the knee-joint, so that the foot and heel could be raised off the bed to some extent.

Reflexes.—The plantars were both absent as well as the knee-jerks, and there was no ankle clonus. There was complete loss of control over both sphincters. The patient was in a very emaciated condition; for some months he had been failing as regards his general health, and was able to take but little nourishment. He was suffering from cystitis.

Operation.—On February 5th, 1898, I operated, with the assistance of my colleagues, Mr. Jackson Clarke and Mr. Chisholm Williams, Mr. John Poland also being present. I cut down to the spine, exposed the laminae of the tenth, eleventh, and twelfth dorsal vertebrae. The arches of the eleventh and twelfth were united together by callus, and were pressing slightly upon the spinal cord. One pointed fragment penetrated the membranes, and upon this being removed a small opening was left, which permitted the escape of cerebro spinal fluid. The cord seemed to be then quite released upon pressure, and I closed the wound. The extremely weak condition of the patient was doubtless the cause of his suffering seriously from collapse, but he recovered in this respect during the night. The wound healed up rapidly, and a few days after the operation I applied a splint similar to that which I have used successfully in spinal cases. The general condition of the patient began to improve within a fortnight after the operation. The bedsores gradually healed up, and the functions of the bladder and bowels began to improve, so that on March 30th I was able to report that during the last fortnight he had regained control over the bladder, to the extent that instead of the urine dribbling away constantly he was able to retain it half an hour at a time, and was perfectly conscious when he wished to pass it, a condition which had not previously existed since the day of the accident, four years and a half previously. As regards the bowels, he was now perfectly conscious as to their action, but the paralysis of the sphincter ani remained. From this time forward the patient improved in every way, until, ten months later, massage was commenced. After about two months of this treatment the patient had gained so much control over the limbs that I contemplated getting him on to his feet. Both feet were in a position of extreme equinus, and it became necessary to divide the tendo Achillis on each side, and place the feet in a position of right angles with the leg. Although the parts felt inanimate and lifeless, yet the healing process took place perfectly, and upon January 18th, 1899, light steel instruments were made to support the right foot and knee and the left ankle, and with the help of these he commenced his attempts to walk. The process was of course a slow one, but on January 22nd he was able to walk across the ward with the assistance of the nurses. By February 1st he was able to work a few steps by himself with the assistance of two chairs, and on February 15th he managed to extend his walk without assistance from one ward to another. He was located for the time at Dr. George Stoker's Oxygen Home, where he had been kindly taken in during the rebuilding of the City Orthopædic Hospital. On March 8th he informed me that he had been able to walk into the next ward and back again three times

during the day, still helping himself with two chairs. Ordinary sticks did not afford sufficiently firm basis to support him, so I had two straight sticks constructed, with a basis to each like a small plate.

On May 5th, 1899, he was walking about the ward by the help of one of his sticks and a chair.

CONDITION OF PATIENT MAY 20TH, 1899.

Left Side.

Hip-joint.—There is fair power of flexion of hip-joint and possibly a very slight power of extension, but the latter doubtful.

Knee-joint.—There is fair power of extension of left knee-joint, so that the leg can be held straight out in the air. There is no power whatever to flex the left knee-joint. An appearance of this movement is produced by flexing the hip-joint when the leg at the knee-joint naturally bends owing to gravity, but if the femur be fixed no flexion at knee-joint can be produced.

Ankle.—No movement whatever at ankle-joint, foot in position of moderate "varus."

Right Side.

Hip-joint.—There is slight power of flexion of hip-joint present, but less than on left side. There seems to be very slight power of extension, but this is doubtful.

Knee-joint.—No movement.

Ankle.—No movement.

Anæsthesia.—Total anæsthesia on right side up to groin, on left side up to level of about 3 inches above knee-joint.

Reflexes.—Knee-jerks and plantar reflexes absent.

Nutrition.—Wasting of both limbs below knee-joint.

By comparing the report of this patient's condition before the operation with that taken on May 20th last, it will be seen that as far as the muscular system is concerned the improvement depends chiefly or entirely upon greater power of muscles which were not at first absolutely paralysed. The only movement that the patient performed voluntarily before the operation was lifting the left leg slightly, so that the increase of power in the muscles as above described has been very great. The chief improvement in nerve power has been the partial restoration of the functions of the bladder and the better nutrition, shown by the healing up of the bedsores. The improvement in general health is also very considerable, for whereas the patient appeared to be rapidly sinking at the time of his admission to the City Orthopædic Hospital, he is now in fairly good health, is cheerful, and enjoys life.

Subsequent History.—In August, 1899, this patient went to the seaside for a change. The rules of the institution where he was received did not permit him to take as much rest as he had been accustomed to. The bath chair which he was permitted to use was furnished with a hard seat, and bedsores, which had healed long previously, returned in the old places. He begged to be allowed to remain in bed so that these sores might heal, but this request was not acceded to. He returned to London in an emaciated condition, the bedsores suppurating freely. His temperature varied from 100° to 103°. There was constant irritation in the bladder, although it was washed out frequently. With perfect rest and careful attention he began to recover again, but uræmic poisoning supervened, and while semiconscious he wounded himself seriously with his razor, cutting deeply in the hypogastric region, but without wounding the bladder, bowels, or large vessels. He succumbed the next day to uræmic poisoning and exhaustion.

Early operation, before his kidneys had become affected, would probably have led to a much more satisfactory result.

CASE OF SYPHILITIC DISEASE OF THE HEART AND LIVER: SUDDEN DEATH.

By SURGEON PERCIVAL M. MAY, R.N.

The following case is of some interest, as cases in which the heart is implicated in acquired syphilis are comparatively rare:

J. A., aged 30, A.B., was admitted into the sick bay at the Royal Naval Barracks at 8 A.M. on June 22nd. He complained of intense pain in the front of the chest and constant vomiting. He stated that he felt quite well the previous evening, but that the symptoms came on in the night. His extremities were cold, his complexion pallid, and his expression anxious. The pulse was very slow and full, the respirations were shallow. He was constantly coughing and expectorating frothy sputum, and he vomited three or four times. On auscultation moist râles were to be heard on both sides of his chest in front, but the heart sounds could not be distinguished at all. He was ordered turpentine stupes to the chest, with hot bottles to the extremities, and was given ether and strychnine, but without any improvement in his condition. He sank rapidly, and died a little over an hour after his admission.

A *post-mortem* examination was made some twenty-four hours after death. The body was that of a well-nourished man, and there were no marks of any scars anywhere. Rigor mortis was well developed. The thoracic cavity was first examined, and the pleura was found to contain a considerable quantity of blood-stained serous fluid. There were no pleuritic adhesions. The lungs were bulky, heavy, deeply congested, and when cut into a large quantity of blood-stained serous fluid exuded. The pericardium contained a slight excess of pericardial fluid, and near the apex of the heart were some patches of recent lymph. The heart was

found to be dilated and hypertrophied; it weighed 21 ounces. The right ventricle was much dilated, and the right auriculo-ventricular valve was incompetent. In the left wall of the right ventricle, at its upper part, and between the two ventricles was a hard, yellowish-white, irregular, nodular mass, about the size of a pigeon's egg, situated in the muscular fibre of the heart, and infiltrating its substance. The growth was firm; when cut into the surfaces gaped, and could not be scraped away with a knife. There was also a small nodule about the size of a pea occupying one of the pulmonary semilunar valves. This growth, together with the small nodule, must have caused considerable obstruction to the flow of blood through the pulmonary artery. The right auricle was also hypertrophied and dilated, but the hypertrophy was not very marked. The left ventricle was dilated and somewhat hypertrophied, and the left auricle slightly dilated.

The arch of the aorta was the subject of an acute aortitis, the inner coat being much inflamed. At the cardiac origin and extending upwards for 2 inches the aorta was much dilated and its coats much thickened. The inner surface was covered with numerous broad greyish white patches, which were slightly raised, hard and somewhat gelatinous looking. Here it seemed that the endarteritis was of a more chronic nature.

The liver was hard and large, weighing 65 ozs. There were many scar-like depressions and puckered cicatrices to be seen on the surfaces, and these on being cut into showed yellow, tough circular masses, some of these being of large size.

The spleen weighed 8 ozs. and was healthy, and the remaining organs were found to be perfectly healthy.

Examination of a microscopical section of the tumour in the heart proved it to be a typical gumma, showing small round cells with an intercellular substance infiltrating the muscular tissue of the heart. There was also some slight caseous degeneration.

There was a well-marked previous history of syphilis in this case, the patient having become infected in June, 1889, with secondary manifestations in July and October in the same year, so that it was exactly ten years from the initial infection to the period of occurrence in the heart. This corresponds with the mean time of occurrence in 18 cases, recorded by Grenouiller. As regards the situation in the septum ventriculorum, only 2 cases have been previously recorded, 1 by Julien and 1 by Wilks; these were from a collection of 19 cases; of the remainder, 8 were in the right ventricle, 3 in the right auricle, and the rest in the left ventricle. No symptoms were noted in this case before the sudden death revealed the condition of the heart, and this appears to be the usual thing in syphilitic diseases of the heart.

A CASE OF POISONING WITH LIQUOR MORPHINÆ HYDROCHLORIDI: RECOVERY.

By HORACE C. COLMAN, M.B., C.M. EDIN.

Broughty Ferry, N.B.

THE following case is an instance of poisoning with morphine hydrochloride, due to the taking medicinally of a little over a grain in rather less than twenty-four hours:

A phthisical patient, on account of hæmoptysis, was directed, on the morning of August 4th, 1899, to take 20 minims of the liquor morphinæ hydrochloridi every four hours. At 4 A.M. on August 5th I was sent for, and found him in the following condition: He was quite unconscious, the pupils were moderately contracted, but not pin point. His skin was warm, and of an earthy colour, and he was sweating profusely: his lips were extremely pale. The conjunctival reflex was lost. Respiration had almost ceased; at intervals there were one or two gasping respirations, and then a long period of quiescence. The pulse was 90 to 100, and full but not very soft. I found from his wife that he had taken four doses of the medicine I ordered, and had insisted on taking a dose of a mixture containing morphine that had been previously prescribed, the last dose being taken at 11 P.M. At that time his wife said he seemed to be drowsy, but was quite sensible. The noise of his breathing woke her up and alarmed her about 3.45 A.M. There seemed to be no doubt that he was suffering from opium poisoning, and, seeing that five hours had passed since the last dose had been taken, it seemed useless to wash the stomach out. At 4.10 A.M. I started artificial respiration, and gave him gr. $\frac{1}{10}$ each of strychnine and atropine hypodermically. There was slight improvement in the pulse after this, the sweating ceased, and the pupils dilated a little. Artificial respiration had to be continued, as if stopped the cyanosis, which was not present at first, became worse, and the pulse-rate quickened. From 5.30 A.M., with the assistance of Dr. Bruce, artificial respiration was continued until 7.45 A.M. In spite of whisky, m xxx hypodermically twice, and continued artificial respiration, there was no improvement, but rather the reverse. The failure of respiration seemed to be the most urgent, and I determined to try the inhalation of strong ammonia. A bottle of 0.80 ammonia was held to his nose for two artificial respirations. The patient became almost black in the face, and his body gave a convulsive heave. The cyanosis passed off in a few minutes after gr. $\frac{1}{10}$ of digitalin followed shortly by gr. $\frac{1}{10}$ of strychnine and gr. $\frac{1}{10}$ of atropine. From this time on there was some improvement—namely, when artificial respiration was stopped; he took a few good breaths, though they soon ceased. I repeated the administration of ammonia, holding the bottle further from his nose, with much the same effect as before, though milder. At 7.45 A.M. he began to breathe naturally, and there was an occasional flicker about his eyelids. We were now able to obtain some coffee, and I poured 10 ozs. of very black coffee with $\frac{1}{2}$ oz.