We often see patients dying of perforation of the bowel, from wasting disease—such as chronic diarrhoea and typhoid fever. In these cases, the poor sufferers are too exhausted, too near death's door, before the perforation occurs; and we can only look on, try to ameliorate symptoms, and wait for the end. But George McClellan was in the prime of life; and would, in all probability, have lived to a ripe old age but for this sudden taking off.

Given a case of perforation of intestine in such a man as George McClellan; and, given a correct diagnosis, which is by no means difficult—what are we to do in the present state of our knowledge? Why, of course, we should open the abdomen promptly, clean out the peritoneal cavity, search for the perforation, pare its edges, and bring them together with sutures; and treat the case as we now treat other cases involving the peritoneum. Rest assured that the day will come, and it is not far off, when an accurate diagnosis in such cases, followed by prompt action, will save life that must otherwise quickly ebb away; and the same thing must be done in gun-shot wounds of the abdomen.

Death from wounds of the abdomen may occur from shock, from hæmorrhage, or from septicæmia; seldom from peritonitis, properly speaking. When from shock or hæmorrhage, there is no reaction, and death is comparatively sudden. Reaction once established, shock is over, and direct danger from hæmorrhage is passed. The great danger is septicæmia from effusion into the peritoneum. Some years ago, it was thought that peritonitis was the chief cause of death after ovariotomy. But this is not the accepted doctrine of the present day.

A CASE OF SCIATIC NERVE-STRETCHING IN LOCOMOTOR ATAXY: WITH REMARKS ON THE OPERATION.

By JOHN CAVAFY, M.D., F.R.C.P.,
Assistant-Physician to St. George's Hospital.

[Concluded from p. 929 of last number.]

I HAVE collected eighteen cases* from various sources, in addition to my own, in which large nerve-trunks have been stretched in locomotor ataxy; and, although the number is not a large one, it will be instructive to review them shortly, and estimate as far as we are able the probabilities of future success or failure.

CASE I. Langenbuch (*Berlin. Klin. Wochenschrift*, December 1879). A man aged 40, with symptoms of ataxy for "several months". The pains affected all four limbs, and were very violent. On September 13th, 1879, the patient being under chloroform, the left sciatic was stretched "violently". The operation was followed by disappearance of the pains in the territory of the operated nerve, but also by sensory and motor paralysis, which, however, subsided in a few days, without any return of the pains. The wound healed very quickly. On September 25th, in one sitting, the two anterior crural and right sciatic nerves were stretched. The wounds quickly healed; the pains disappeared; and motion and sensation, which were at first paralysed, were soon restored. The patient's walking gradually improved, and the ataxia entirely disappeared. It seems not to have returned three months after the first operation; but the pains continued severely in the upper extremities, and it was decided to operate on the brachial nerves. The patient died of convulsions during the administration of chloroform for this purpose. The cord was preserved, and examined by Westphal (*loc. cit.*, No. 8, 1881), who found that there was no disease of the posterior columns. He therefore concludes that the case was not one of true ataxy.

CASE II. Esmarch (*Deutsch. Med. Wochenschrift*, No. 19, 1880) operated in a case diagnosed as ataxy by Quincke. As the pains were most severe in the forearms, he stretched "strongly" the nerves in the axilla. The pains disappeared, not only in the arms but in the legs also, and the ataxy subsided. No further details are given.

CASE III. Erlenmeyer (*Centralblatt für Nervenheilkunde*, No. 21, 1880). A man, aged 30, had suffered from ataxy six years. There were no pains at the time of the operation, which was done in June 1880 under chloroform. The right sciatic nerve was exposed at the sciatic notch, "strongly stretched", and then "twisted" and held some time in this position. The wound healed by first intention. Ten days later, a similar operation was done on the left sciatic, followed by erysipelas, the wound not healing for six weeks. There seems to have resulted a very slight increase in strength, but no improvement whatever in sensation and co-ordinated motion.

CASE IV. Debove and Gillette (*Union Médicale*, No. 165, 1880).

A man aged 56, with ataxy for at least six years. The pains were very severe and frequent, and ataxia extreme, so that he was bedridden for eighteen months, being quite unable to stand. In November 1880, Gillette operated on the left sciatic nerve in the middle of the thigh. The nerve being exposed, was twice raised nearly six inches above the level of the skin, and then "violently" stretched in its long axis. There was no motor or sensory paralysis, but, three weeks after the operation (which was done antiseptically), the wound remained unhealed. At that time, there were no pains; cutaneous sensation was restored to normal, and motor inco-ordination so much diminished, that the patient could stand upright leaning on an attendant, which was previously impossible.

CASE V. Socin (*Sury-Bienz. Deutsch. Med. Zeitung*, No. 1, 1881). A man aged 33, with ataxy and violent pains. The right sciatic was stretched antiseptically. The wound did not heal, but the pains disappeared on that side. The left sciatic was then stretched, as the pains continued on that side. Fifteen days later, the patient died from pulmonary embolisms, arising from a clot in the right femoral vein.

CASE VI. Debove and Gillette (*Bull. de la Soc. de Chirurgie*, 1880, p. 718). A man aged 50, with ataxy. The pains were especially severe in the upper extremities for fifteen years. Two nervous trunks of the right brachial plexus were stretched, probably the median and ulnar, with the internal cutaneous. Two directors were placed under the nerves, and then "violently" drawn towards the surface, raising them four inches above the skin. An assistant who held the arm felt a distinct crackling in the nerve-sheaths at the time. The wound healed by first intention, and was followed by cessation of pains in all extremities, and great improvement in the ataxy which affected the lower extremities.

CASE VII. Debove and Gillette (*loc. cit.*, p. 719). A man aged 30, with ataxy and very severe lightning-pains in the abdominal viscera. The left sciatic nerve was stretched, the force employed rupturing a medium-sized vein. The operation is said to have been followed by persistent improvement. No further details are given.

CASE VIII. Gillette (*Arch. Gén. de Méd.*, July 1881, p. 80). A woman with ataxy for five years. The radial and median nerves were strongly stretched on the right side. The pains subsided in the upper, but increased in the lower extremities. No further details are given.

CASE IX. Bastian (*BRITISH MEDICAL JOURNAL*, July 2nd, 1881, p. 1). A man aged 39, with ataxy for three years and a half. In February 1881, he was unable to stand without the support of two persons, and suffered from much pain in the hypogastrium. Mr. Marshall operated under ether. The right sciatic was exposed in the middle third of the thigh, taken between the thumb and forefinger, twice pulled upwards from below, and afterwards from above downwards, the nerve being raised one to two inches above the skin. The pain disappeared. The left sciatic was afterwards operated on in the same manner. More than six weeks after the first operation, he still required two people to support him to stand upright, and was very weak on his legs; but the gait is said to have been better than before. There was no return of pain.

CASE X. Bastian (*loc. cit.*). This case was less advanced. It is noted that, five weeks after the operation, there was "no appreciable improvement in the patient's condition". The nerve was probably more forcibly stretched than in the first case. The wounds in both healed slowly.

CASE XI. Johnston (*loc. cit.*, p. 11). A man aged 39. Pains for twelve years, and ataxy established for three years. Esmarch's bandage was applied to the upper part of the right thigh, and the sciatic nerve exposed in the middle third under local anaesthesia. It was then pulled upwards vertically "with some force", the whole weight of the limb being suspended by the nerve. This was repeated three times. Five weeks after the operation, the pains were found to be not nearly so acute as before, and came on at longer intervals; the anaesthesia was somewhat diminished, but there was no improvement whatever in the ataxy.

CASE XII. Langenbuch (*Berlin. Klin. Wochenschrift*, No. 24 to 27, 1881). A man aged 53, with ataxy for one year. The right sciatic and anterior crural nerves were stretched. There was great diminution of the ataxy, subsidence of the pains and constriction; and micturition, which was very slow and difficult, was much improved.

CASE XIII. Langenbuch (*loc. cit.*). A woman aged 32, ill five years with ataxy and commencing lateral sclerosis, as diagnosed by Westphal. The left sciatic nerve was stretched. A month later, she barely tottered with closed eyes, walked more strongly, and entirely without ataxy; in fact, she seemed completely cured, but there was no return of the knee-reflex.

CASE XIV. Langenbuch (*loc. cit.*). A man aged 52, ill for eleven years, with lightning-pains followed by ataxy, which was moderately

* I believe that a few published cases have not been included in this number.

developed. Both sciatics were stretched, and he was completely cured.

CASE XV. Langenbuch (*loc. cit.*). A man aged 45, with ataxy for seven years. The atactic movements were extreme and grotesque, affecting both upper and lower extremities. Both sciatic and the right median nerves were stretched. In two months, mere traces only of the ataxy remained.

CASE XVI. Langenbuch (*loc. cit.*). A man aged 31, with moderate ataxy for one year. The right sciatic and left anterior crural nerves were stretched, followed by very great improvement in motion and sensation, most marked on the left side.

CASES XVII and XVIII. Benedikt (*Wien. Med. Presse*, No. 30, 1881). No separate details of these cases are given, the paper being preliminary only. It is said that the pains, which were present in both patients almost continuously, disappeared after one sciatic operation, not only in both lower extremities, but over the whole body. Constrictive pains also subsided, and anæsthesia was improved. In one patient, who had long suffered from paralysis of the bladder, stranguy and phosphatic urine, these symptoms disappeared. The ataxy was markedly improved, especially by a double operation; one patient who could only walk with two sticks, being afterwards able to walk without any support, and to turn round easily. One of the patients showed improvement in the contracted pupils, but the tendon reflexes were uninfluenced in either.

It is much to be regretted that some of these cases have not been reported in more detail, but it appears to be established that the operation was markedly beneficial, or even curative so far as the pains were concerned, this being the case in seventeen out of nineteen. The result, however, seems to have been by no means the same in all. In the greater number, all pains were removed, or at least greatly alleviated by one operation; but in three cases they subsided only in the territory of the operated nerve, while in one they disappeared from the part operated on, but increased elsewhere. The improvement seems to have been permanent in the majority, but on this point it is impossible to speak with confidence in the absence of further details. In Dr. Johnston's and in my own case, the pains reappeared, though less severely; and we should bear in mind that spontaneous remission of the pains in ataxy often occurs for considerable periods. The ataxy itself is said to have been cured in four cases only, three of Langenbuch's, and Esmarch's. Langenbuch's first case proved to be not affected with posterior sclerosis, and must be excluded from consideration, unless we admit the existence of a purely functional ataxy. Benedikt, however, goes so far as to say that the absence of posterior sclerosis *post mortem* does not prove the absence of this condition *intra vitam*, and that its disappearance may have been brought about by nutritive changes set up in the cord by the operations. With our present knowledge, it is difficult to share this somewhat enthusiastic view. Langenbuch himself considers it a case of genuine ataxy, in so early a stage that the peripheral nerves only were affected, and believes that the affection always commences in this manner, the posterior sclerosis coming on later. Esmarch's case was only shortly communicated in the course of a discussion, and is so wanting in details, that it must be received with caution. In eight cases, the ataxy was diminished; strikingly in three of Langenbuch's, the first two of Debove and Gillette, and in Benedikt's; only very slightly in Bastian's first case. In four, there was no improvement—Erlenmeyer's, Bastian's second case, Johnston's, and my own; while in the remainder the result is not stated. I think we may probably class them as failures in this respect, as it is not likely that any improvement would have been overlooked. It appears probable, therefore, that benefit is to be always expected from the operation so far as the pains are concerned, but that the prospect of improvement in the ataxy is much less certain. Langenbuch, however, takes a much more hopeful view, and Benedikt concludes that the operation can convert a severe case of ataxy into a mild one, and, so to speak, an advanced case into an early one. I am inclined to think that the operation is applicable especially to early cases, and where pain is a prominent symptom; but I should not hesitate to employ it in later ones also, as it has not been followed by any injurious results beyond temporary paralysis, and this very rarely: the rupture of a vein in one of Gillette's cases, and the venous thrombosis and erysipelas in Socin's and Erlenmeyer's, are merely surgical accidents. The wound itself is sometimes very slow to heal, a sluggishness which does not appear to be connected with the duration of the disease; as in my own case, in which the ataxy had been manifested only three years and a half, the wound was unhealed after six weeks, while in Debove and Gillette's second case, in which symptoms had existed for fifteen years, it healed by first intention.

It is most desirable that surgeons should come to some agreement as to the best mode of operating, and especially as to the force to be em-

ployed. The cases show considerable variety in these respects, as to point of exposure of nerve, direction of traction, etc.; and the words "strongly," "violently," and so on, used in describing the operation, afford us no means of judging of the strength of the extension. As Dr. Bastian justly remarks: "It is quite possible that too weak a pull may produce little or no effect; but, on the other hand, too strong a pull may yield either no good results, or results which are positively harmful." The impression I have derived is that, in the foreign cases, which have been followed by greater benefit than the English ones, a greater force was used, and that it was often applied more suddenly than in this country; [this point deserves attention, as the same force used with a jerk, or applied in gradual extension, would probably give different results. Langenbuch appears now to prefer gradually increasing extension, and uses as a test for the force to be employed, the effect produced on the pulse and breathing; these are sometimes even doubled in frequency, while in other cases the opposite occurs, and they may be as much diminished. He continues to drag on the central end of the nerve with increasing strength until a distinct effect is produced on the pulse, which is counted aloud by an assistant; he then stops, and finds that the pulse and respiration return almost at once to their normal rate. I believe this is probably the best mode of operating. M. Gillette has devised an instrument, which he calls a "nerve-stretcher". (*Bull. de la Soc. de Chirurgie*, 1881, page 533.) It consists essentially of a somewhat flattened blunt hook, which is inserted under the nerve, traction being made at right angles to its course, while the limb is held down by an assistant; a dynamometer is so connected with the instrument that the force employed is exactly indicated on a dial. The only objections to this apparatus are, that the extension must affect the central and peripheral portions of the nerve equally, and that the pressure of the hard hook against the part of the nerve to which it is applied must give rise to more extensive local crushing and bruising than would be the case with the finger and thumb. The introduction of the dynamometer, however, is a genuine improvement.

It would occupy too much time to inquire as to the mode of action of the operation, especially as the subject is still under investigation by experimenters; but, so far as we know, a forcible extension of a nerve, when not excessive, is followed by temporary paralysis only; and, further, the operation seems to act on the spinal cord as well as on the nerve itself.

CASE OF INJURY TO THE CERVICAL PORTION OF THE SYMPATHETIC NERVE, IN REMOVING A SARCOMA.*

By THOMAS F. CHAVASSE, M.D. Edin.,
Assistant-Surgeon to the General Hospital, Birmingham.

EULENBERG and GUTTMANN, in their work upon the *Physiology and Pathology of the Sympathetic System of Nerves*, state that there are no recorded cases in which a direct injury, confined to the cervical part of the trunk of the sympathetic, can be asserted with confidence. The following case would, therefore, seem to be of interest—not only surgically, but also physiologically.

K. T., aged 6, a pale delicate-looking girl, came to the out-patient room at the General Hospital, early in August 1880, to receive treatment for a tumour lying under the horizontal ramus of the jaw, in the position of the right submaxillary gland. According to the statement of the mother, a small lump, of the size of a hazel-nut, was noticed in the position named at the time of birth. The increase in size was slow, and in accordance with surgical advice, not much attention was paid to the abnormality until three months before coming to the hospital, when a visibly increasing enlargement was perceived. The following is the description of the tumour when seen in August 1880. Its situation was at the upper portion of the right anterior triangle of the neck, just below the horizontal ramus of the inferior maxilla. Its size was that of a Tangerine orange; it was firm to the feel, movable, and, as far as could be ascertained, not connected with the surrounding textures; it was painless.

August 18th, 1880. I made an incision over the tumour, parallel to the ramus of the jaw. It was then found that the tumour had no connection with the submaxillary gland, but was encapsuled, and dipped down deeply into the neck. Quite superficially, lying over the front of the capsule and adherent to it throughout, a large nerve was observed, the precise nature of which was doubtful until it was gently seized by a pair of forceps, preparatory to dissecting it away from its adhesions. The breathing of the patient was immediately much impaired, becoming jerky; and the child, although fully under the influence of chloro-

* Read before the Birmingham and Midland Counties Branch.