in the posterior or sensory roots of the painful nerve, or in the central grey matter, with which it comes into closest contact. But, as cessation of the pain is almost immediate when the nerve is stretched, and as it has been shown that the stretching of a nerve does not primarily influence the centre, it would appear that, at any rate in these cases, the neuralgia should be ascribed to change of function in the trunk, or in its periphery.

A morbid condition of the spleno-maxillary ganglion has been recently suggested as a cause for intractable facial neuralgia; and the ganglion has been several times removed with, it is said, good results. It is, however, not improbable that, as the superior maxillary nerve must be stretched in the operation, the benefit obtained depended on the stretching of the nerve, rather than on the removal of the ganglion.

THE IMMEDIATE CURE OF INGUINAL HERNIA BY A NEW INSTRUMENT.

By W. DUNNETT SPANTON, M.R.C.S.ENG.,

Surgeon to the North Staffordshire Infirmary.

(Continued from page 921.)

APPENDIX OF CASES.

CASE I. Right Oblique Inguinal Hernia.—W. H., aged 18, a farmer's son, living in Shropshire, working on the farm, was seen at Hanley on December 12th, 1877. He was a healthy muscular lad, had always enjoyed excellent health, but, for about a year, had been the subject of right oblique inguinal hernia. I saw him in consequence of strangulation of the hernia, caused by lifting some heavy baskets from a market-cart. After fomentations and a dose of opium, the hernia was reduced by taxis; and, keeping him quiet until December 5th (four days after), I performed the operation for radical cure, in the manner already described. The rupture was small, and the opening of the internal ring was small also. Ether was administered by Mr. W. A. Frost, who assisted me, and the operation was performed without any difficulty. He suffered no pain worth mentioning, and had no constitutional symptoms. No medicine of any kind was given until on the third day a dose of castor-oil; after which time, the bowels acted naturally. On the tenth day, the instrument was removed, both of the openings in the skin at that time discharging a little pus, and the scrotum and testis of the same side being swollen. There was a firm band of adhesion along the whole line of the inguinal canal. The wounds quickly healed under the application of terebene oil, and a hard thickened plug remained, **completely closing the hernial opening**, so that no impulse could be felt on coughing. He wore a truss for better security. I saw him about two months afterwards, when the adhesions remained quite firm. About six months afterwards, he felt so secure, that he gave up wearing the truss; and, during some violent exertion in the hay-field, there was a partial giving way of the adhesions, with a tendency to a return of the hernia. He has since that time worn a truss, and had no further trouble. In this case, I think I was rather too timid, and failed to take as secure a hold of the abdominal rings as I ought to have done; but, as a test-case, the result was so far a source of satisfaction to me, **inasmuch as it showed that the operation could be carried out without a symptom to cause any uneasiness.**

CASE II. Congenital Hernia in a Child.—T. B., aged 4 years, was healthy and strong, and had a right congenital rupture. On admission into the North Staffordshire Infirmary, on October 2nd, 1878, there was a large scrotal hernia of the size of a large duck's egg; and two fingers could be easily passed through the hernial opening. He had worn a truss for some time, but it was quite impossible to keep up the hernia, and it would even force down under the pressure of the fingers. On October 7th, 1878, chloroform being administered, I operated, some of my infirmary colleagues being present. In this case, there being no proper sac, the scrotal fascia and tunica vaginalis formed the invaginated plug; and it is noteworthy that, with the free communication with the general peritoneal cavity which existed, there was no sign whatever of peritoneal irritation. The child suffered from chloroform-sickness for some hours, but afterwards progressed most favourably. He made no complaint of pain except when disturbed, and no constitutional symptoms showed themselves. Considerable oedema of the scrotum followed; and, on October 13th (six days after operation), there was free suppuration from both the openings. The instrument was removed under chloroform. A hard thickened mass of tissue occupied the inguinal canal, and, on straining or coughing, no impulse could be felt. On the 18th, the wounds were quite healed, and the child was in perfect health. The opening was securely closed, and remains so.

CASE III. Right Oblique Inguinal Hernia.—A. S., a warehouseman,

aged 15, was admitted into the North Staffordshire Infirmary under my care on October 29th, 1878. Three weeks before admission, while lifting a weight, he first noticed the hernia. There was a small right inguinal hernia, which had never been strangulated. The general health was good. After the usual preparation, I operated under ether on November 9th. Considerable pain was complained of after the operation, which was at once relieved by loosening the bandage, and the administration of a hypodermic dose of morphia. He had no sickness. On November 12th, there was considerable oedema of the scrotum, and some purulent discharge from the wounds, especially the lower one. He slept well, and the general health remained good. On November 18th, he complained of some abdominal pain on the right side, with tenderness in the right inguinal and iliac regions. There was a slight erysipelatous blush in the same neighbourhood, with moderate discharge of pus. The temperature rose for the first time to 101.2° Fahr. After an enema, the bowels acted; the instrument was removed, and a warm-water pad applied, with immediate relief. From this date, the pain, swelling, and discharge gradually subsided, so that, nineteen days after operation, he was able to be shown to a meeting of the Staffordshire Branch of the British Medical Association. He left the hospital about a fortnight afterwards, when the occlusion of the inguinal canal was so complete, that no truss seemed to be needed. In this instance, much more irritation was set up than in either of the preceding ones. The result showed, however, that it was purely local; and this, of course, within certain limits, is likely to prove beneficial rather than injurious in its ultimate effects.

CASE IV. Left Inguinal Hernia.—Annie B., aged 9, living at Stoke, was admitted, under my care, into the infirmary on December 7th, 1878. She was a ruddy, healthy-looking, plump girl. Her mother stated that while playing, about a year previously, the hernia appeared. It was readily reduced on lying down, was about the size of a small hen's egg, and had never been strangulated. The hernial opening admitted one's finger easily. With the ordinary preparations, the operation was performed on January 1st, 1879, under chloroform, and with strict antiseptic precautions under carbolic spray. Carbolic gauze was used to protect the point of the instrument. The temperature never rose beyond 99° Fahr. There was an entire absence of sickness or other constitutional disturbance. On January 4th, the bowels acted naturally. On the 8th, the instrument was removed (the temperature rising on that day, affording us a good indication for doing so). There was some induration along the track of the screw, and a few drops of pus at each opening. On January 13th, the wound was again dressed under spray. There was very slight discharge; a firm cord was felt along the line of the inguinal canal. There was no tendency to any protrusion. On January 16th, the antiseptic dressings were left off. The wounds were quite healed, and firm. She was kept in bed a few days, and a pad and bandage applied. She left the hospital ten days afterwards, perfectly well, and not requiring a truss. She has continued sound up to the present time.

CASE V. Right Oblique Inguinal Hernia.—S. T., aged 11, a school-boy, was admitted into the infirmary, under the care of my colleague, Mr. Folker, on January 7th, 1879.* Six months before admission, the hernia was caused by a strain. The tumour was small, the internal ring easily admitting the point of the finger. On January 11th, the operation was performed under chloroform. On the 14th, there had been no complaint of pain; the discharge was slight, and the temperature and pulse normal. On the 17th, there was some oedema of the scrotum, and increased discharge, with slight pain. Castor-oil was ordered. On the 18th, the instrument was removed, some little difficulty being encountered in taking the gauze off the point. On the 26th, he was allowed to get up, with a pad and bandage applied. The inguinal opening was firmly closed by a hard band, and there was not the slightest impulse to be felt. On February 10th, he left the hospital cured. The boy came to the infirmary three weeks afterwards, to show a "lump" which had appeared where the hernia had been. This was found to be fluid—an artificial hydrocele of the cord, in fact—which was conclusive in showing, not only that the internal ring was closed, but the external opening effectually closed also. The fluid has since gradually become absorbed, and there exists now only a fibrous cord along the track of the inguinal canal.

CASE VI. Right Congenital Inguinal Hernia.—W. B., aged 3, was admitted, under the care of Mr. Folker, on April 1st, 1879. The internal ring easily admitted the index finger. The left ring was closed, and both testes had descended. Operation, having been delayed, in order to improve the child's general health, was performed on May 10th, under chloroform. The next day, the little fellow wanted to get

* For the notes of this and the following cases I am indebted to our house-surgeon, Mr. G. Russell, M.B.

up; he had no pain, and was only annoyed at the confinement. At night, he became feverish, and had some abdominal pain, with retention of urine, requiring the use of the catheter. On May 12th, there was no pain nor further retention. On May 17th, the discharge was profuse. The instrument was removed; the opening being completely occluded. On June 2nd, he was allowed to get up; no pad or truss being needed, as there was no tendency whatever to a return of the hernia. He left the infirmary on June 5th quite well, and has remained so.

CASE VII. Large Right Inguinal Hernia.—T. K., aged 26, a potter, was admitted, under my care, on April 28th, 1879. The patient had a large right inguinal hernia, which had existed about two years; and he was suffering also from nodular scrofulous disease in each testicle, the right one being as large as a goose-egg. His general health being unsatisfactory, cod-liver oil and iodide of iron were ordered, with Scott's dressing to the testis. On June 7th, his condition being much improved, and the size of the testes diminished, the operation was performed under carbolic spray, chloroform being given. The hernial sac was thick, and very adherent to the surrounding tissues; but invagination was effected without much difficulty, the inguinal canal being open enough to admit two fingers. Next day (June 8th) he was free from pain; no sickness; temperature, 99° Fahr. On June 9th, the dressings were changed. The wounds were quite quiet; temperature, 98.4° Fahr. On June 11th, he was again dressed; temperature, 99.4° Fahr. On the 14th, there was very slight suppuration from each opening; temperature, 98° Fahr. On June 16th, the instrument was removed easily; there was free suppuration from both openings. His general condition was good. The bowels acted spontaneously. The patient was restless and fidgety, so that the dressings were disturbed rather frequently. The temperature yesterday was 100° Fahr.; to-day, 99.8° Fahr. On the 19th, the upper wound was closed; there was very slight suppuration. A firm cord could be felt along the line of the inguinal canal, which was securely closed. The swelling of the testis was greatly diminished. (Incidentally, this is an interesting fact, and is probably explained by the blood-supply being diminished from pressure on the vessels of the spermatic cord.) On July 3rd, he was allowed to get up and walk, a pad and bandage being applied. The temperature varied; the highest record being 100° Fahr., until June 23rd, when it was normal. On July 10th, the wounds were firmly closed; there was no impulse on coughing. He was discharged cured. He has reported himself since, keeping quite sound, but wearing for security a light pad-truss.

CASE VIII. Right Inguinal Oblique Hernia.—George W., aged 8, was admitted under the care of Mr. Folker on June 12th, 1879. The hernia was about the size of a hen's egg, the hernial opening easily admitting the index finger. On June 21st, the operation was performed under chloroform. After the operation, vomiting occurred; and he complained of some pain, which was relieved by an opiate. On June 23rd, the dressings were changed. There was no discharge. The patient was rather restless, but slept well. On June 26th, the scrotum was red and swollen. There was slight discharge, and rather more pain. On June 30th, the instrument was removed. The discharge was profuse, and the scrotum still oedematous. On July 5th (fourteen days from operation), the discharge had ceased; the wounds were rapidly healing; the swelling was subsiding. On July 9th, the wounds were healed; no discharge. The swelling was gone. There was no impulse on coughing. On July 16th, the patient was quite well, and the wounds quite sound. A few days afterwards, the hernia showed a tendency to return *behind* the cord; the anterior part of the inguinal canal remaining firmly closed.

CASE IX. Congenital Right Inguinal Hernia.—L. R., aged 3, a healthy little fellow, was admitted under the care of Mr. Folker on June 24th, 1879. After the usual preliminary preparation, he was operated on June 28th, under chloroform. On the 29th, the temperature was 99° Fahr.; on the 30th, 98.4° Fahr. July 1st. He had been very "good" since the operation, not requiring any opiate, nor any special attention. Temperature 100.2° Fahr. On July 4th, castor-oil was given, which acted twice, causing no pain. The discharge was more free. Temperature 100.2° Fahr. On July 6th, under chloroform, the instrument was removed; the India-rubber covering the point being much more easily managed than the gauze used in the previous cases. Temperature 100° Fahr. On July 9th, the discharge was much less. All swelling and irritation had subsided. The bowels acted daily. On July 14th, there was no discharge. He was allowed to get up. The openings were quite firmly occluded.

CASE X. Right Inguinal Hernia.—Wm. J. T. aged 9, was admitted under the care of Mr. Folker on July 17th, 1879. No cause was assigned for the rupture, which was first noticed about a year before. It was of the ordinary oblique kind, and about the size of a hen's egg, reaching into the scrotum. On July 19th, after the usual preparation, the

operation was performed under chloroform. Much sickness followed, and considerable straining. Temperature 98.2° Fahr. On July 20th, there was no complaint of pain; no sickness. Temperature 99° Fahr. On July 26th (seventh day), the instrument was removed. There was some discharge from both openings, but less than in some of the previous cases. An enema was ordered, as castor-oil, previously given, had been inoperative. The temperature was 99° Fahr.; it had been, on the 25th, 99.8° Fahr. On July 28th, there was little discharge, and no surrounding irritation. The patient felt "quite well". On July 31st, the line of the canal was hard and dense, and appeared most effectually closed. There was no impulse on coughing.

CASE XI. Left Inguinal Hernia.—Wm. Jas. D., aged 13, was admitted on July 17th, 1879. About two years previously, the rupture was occasioned by lifting a very heavy weight, and was now about the size of a hen's egg. On July 22nd, the operation was performed, after the usual preliminaries, under chloroform. In this case, a steel instrument was used. On July 23rd, there was no sickness; but he complained of some slight pain. Temperature 99° Fahr. On July 26th, the discharge was rather free; and surrounding irritation was more marked than in most of the cases—due, possibly, to the employment of a steel instead of a plated instrument, but also in some degree to the fact that the point of the screw pressed rather firmly on the scrotum. It would have been better, perhaps, if another turn had been made in the operation, so as to place the point beyond the skin of the scrotum. On July 28th, the discharge was more profuse. The temperature yesterday was 99.4° Fahr.; to-day, 98.4° Fahr. On July 28th, the patient was rather feverish. The temperature had risen to 101.4° Fahr. The instrument was removed quite easily, the India-rubber slipping off very readily. On July 31st, he was quite comfortable. The discharge was slight. He had no pain. Temperature 99.4° Fahr. A firm hard swelling was felt along the spermatic canal; and there was no impulse whatever on coughing.

CASE XII. Right Oblique Inguinal Hernia.—John B., aged 11, was admitted to the Staffordshire Industrial School, under my care, on July 25th, 1879. The cause of the hernia was unknown; but the rupture was first observed about two years before, and was about the size of a small orange. No truss had been worn. On July 26th, after the usual preparation, the operation was performed under chloroform. On July 28th, he complained but little of pain, though an irritable subject. There was slight purulent discharge, and some oedema of the scrotum. Temperature 100.4° Fahr. There had been no sickness since the

Fig. 5.—From a photograph taken three days after operation.

operation. He had a rather troublesome cough (which he had had some time); but there was no tendency to any reappearance of the hernia. He was ordered some linctus, to be taken frequently. On July 29th, the temperature was 100° Fahr.; on the 30th, 98.6° Fahr. On July 31st, the line of the inguinal canal was quite hard and firm; the instrument still in. The temperature was normal. On August 4th, the instrument was removed. The hernial canal was firmly occluded. He was discharged well on September 27th. He has been working on a farm since, and remains quite well.

CASE XIII. Right Inguinal Hernia.—Elizabeth W., aged 20, a domestic servant, a healthy strong young woman, was admitted into the North Staffordshire Infirmary, under the care of Mr. Alcock, on July 15th, 1879. When lifting a heavy weight, she noticed a swelling suddenly appear in the right groin, which, on admission, was found to be a hernia about the size of a hen's egg, which disappeared in the

recumbent posture. On July 31st, the operation was performed under ether, No. 2 screw being used. She progressed without any unfavourable symptom. The instrument was removed on August 8th, the opening being firmly plugged. She left the Infirmary on September 18th, quite sound.

THE RADICAL CURE OF HERNIA.

By GEORGE WHYTE, M.D., Elgin.

VARIOUS modifications of Mr. Wood's operation for the radical cure of inguinal hernia have, from time to time, been suggested in the pages of the various medical journals; the principle adopted in all being the same—viz., bringing together the pillars of the inguinal canal; while, at the same time, the invaginated sac, with its coverings, is used as a plug to fill up the canal, and so prevent descent of the bowel. To carry out this principle, and to secure this result, various surgeons have adopted and advocated different modes of procedure. Having read, in the issue of the BRITISH MEDICAL JOURNAL for December 11th, 1880, a paper on this important subject by Mr. Dunnett Spanton, in which he proposes to obliterate the canal by means of a screw-like instrument, I thought it might be interesting to publish the following case, upon which I operated over two years ago, as the method adopted appears to me to have some special advantages.

J. H., aged 10, a seven months' child, had double congenital inguinal hernia. When he first came under my care, the bowel on both sides descended half-way to the knees. It was, however, easily reduced in the recumbent position, and my three fingers could be passed into the abdomen. His parents informed me that an operation (apparently Wutzer's) had been previously performed when he was a child, but that the "plug" was forced out by crying—the only effect being to make matters worse instead of better. Trusses of various kinds had been persistently and perseveringly tried, but the bowel always slipped down. As the parents were afraid to let the boy go to school, or even mix with other children, they were most anxious that something should be done; so, after giving a further trial to trusses, without benefit, I performed the following operation.

The boy, having been confined to bed for a few days, had his bowels well cleared out by enema on the morning of the operation. Chloroform having been administered, and the right rupture reduced, I began by doing what is really the first part of Professor Wood's operation—viz., incising the skin over the fundus of the tumour, and separating it from the coverings of the sac. The forefinger of the left hand, smeared with carbolised oil, was then passed into the canal, pushing before it the sac with its coverings. The edge of the internal oblique muscle was now felt for and clearly defined, and the inner pillar of the canal elevated on the tip of the finger. A curved needle, with a long and strong handle, was now taken in the right hand, and passed through the abdominal wall, piercing the inner pillar of the canal, and the invaginated sac and coverings, on to the tip of the finger, along which it was passed until the eye appeared at the external wound. Dr. Adam, who was kindly assisting me, then threaded the needle with a specially prepared carbolised ligature. The needle was now partially withdrawn until it freed itself from the pillar, over which it was brought into the canal again on to the finger, and unthreaded. The outer pillar of the canal was now defined, and pressed forward with the finger, and the needle again passed through the abdominal wall and outer pillar on to the finger, out of the wound, and threaded; then partially withdrawn, and passed over the pillar into the canal again, and unthreaded as before. I next passed the needle through the abdominal wall, at a point lower down, through the conjoined tendon, on to the finger and out at the external wound. The ligature from the external pillar was passed through the eye of the needle, which was then passed over the conjoined tendon and out at the external wound, and again unthreaded. It was next passed through the skin over the lower part of the outer pillar, through Potpart's ligament, and threaded with the ligature from the inner pillar, and passed over the pillar and out at the external wound as before, and unthreaded. I had thus applied subcutaneously a ligature like a boot-lace to the inner and outer pillars of the inguinal canal, and through the invaginated sac, in such a manner that, when the two ends were pulled upon, the pillars were approximated, and the invaginated sac retained as a plug. Before withdrawing my finger, I washed out the canal with carbolic solution. I then flexed the thigh, and gradually tightened and tied the ends of the ligatures and cut them off. The external wound was closed with carbolised gut-sutures, which were passed deeply, and a suitable dressing and bandage applied. A similar operation was performed in the left side. The patient was then put to bed, and an opiate given.

The after-progress of the case was in every way satisfactory. A light truss was recommended to be worn as a precaution. Two years have

now elapsed since the operation, and the boy can enter into all the rough sports of the school without in any way inconveniencing him.

The above operation, though perhaps a little tedious in recital, would not be difficult to those who meet with such cases oftener than falls to the lot of a country surgeon. It appears to me to offer some advantages over both Professor Wood's and Mr. Spanton's method—the most important of which is, that, by using carbolised silk or gut ligature, the sources of irritation in the wound are reduced to a minimum. The wire in the former, and the screw-like instrument in the latter method, must cause a good deal of pain and irritation, which would be better avoided, especially in children.

I am quite aware that the above case, or rather, I should say, two cases, go for little; but, as the success has been marked, I have been tempted to publish them, in the hope that the method may receive a further trial from those who have more opportunities.

SURGICAL MEMORANDA.

THE TREATMENT OF FINE STRICTURES.

THE first difficulty in the treatment of fine strictures is invariably the greatest; when we have once succeeded in passing any instrument into the bladder, difficulties diminish as we proceed. It occasionally occurs, however, that a filiform bougie has, with perseverance, been conveyed into the bladder, and repeated failures result when attempts are made to pass a bougie of a larger size. This difficulty can frequently be overcome by first passing the filiform bougie into the bladder, and then passing a second down to the stricture. The second bougie is then held firmly against the stricture by an assistant, whilst the operator withdraws the first bougie about a couple of inches; he then grasps the two bougies between his finger and thumb, and passes both instruments simultaneously through the strictured part of the urethra. The two bougies may either be retained or withdrawn, according to the method of treatment the surgeon has in view. If they be retained, they cause no inconvenience to the patient, and in some strictures afford considerable benefit. On another occasion, a third bougie may be added on the same principles as the second; the first two being withdrawn a couple of inches, and the third passed through the stricture in company with the other two. It will, as a rule, be found that, after three bougies have penetrated the stricture in this manner, a No. 2 or No. 3 bougie can then be passed without difficulty, and the subsequent treatment be conducted on ordinary principles.

I have frequently demonstrated in hospital the advantages of this plan of treating fine strictures, and I am confident that others will find their efforts to dilate obstinate strictures facilitated, should they think proper to adopt it.

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PYEMIA FOLLOWING GRADUAL DILATATION OF STRICTURE OF THE URETHRA: RECOVERY.

THE report of the following case presents two points of special interest: 1. It shows that the simple gradual dilatation of an ordinary uncomplicated stricture may be followed by pyæmia; and, 2. It proves the very interesting clinical fact that pyæmia, attended by the formation of numerous secondary abscesses attacking the extremities and integuments alone, runs a chronic course, but tends eventually to recovery.

Mr. S., aged 55, consulted me on October 21st, 1879, for the relief of a stricture, with all its unpleasant concomitant symptoms. As he desired to follow his usual avocations, I determined to employ the gradual dilatation process, as less likely to cause any constitutional disturbance, or otherwise interfere with his convenience. Fortunately, I had at hand a splendid, well finished, new set of French olivary bougies. After a patient and prolonged trial, I succeeded in introducing a No. 2. The stricture was a bulbo-membranous one, and uncomplicated. The kidneys were healthy. At intervals of two or three days, I introduced bougies of increasing size, two or three at a sitting, till I reached a No. 12, when the withdrawal of this instrument was followed by a slight bloody discharge. The stricture must, of course, have been more or less lacerated, though I feel confident that force was not used. Then followed a great deal of constitutional disturbance. I ordered half a grain of opium at bedtime; alkalies and hyoscyamus three times a-day. The medicines gave but temporary relief; I was, therefore, not altogether taken unawares, on December 10th, to find the supervention of "severe recurrent rigors and sweating of pyæmia, accompanied by local signs of secondary suppuration". Vomiting set in, and persisted for twenty-four hours. The temperature varied suddenly from 100° to 104°. My patient presented all the clinical symptoms of a well-marked and severe case of pyæmia. Fortunately for