case has no ataxy proper. He may co-ordinate his limbs in locomotion without any evidence of ataxy, provided he be kept steady, and does so in his continued efforts to preserve his equilibrium. Walking certainly requires equilibration; but equilibration—co-ordination in space—implies a great deal more than mere locomotion. I am in the habit of putting patients in whom I suspect cerebellar disease through a series of exercises calculated to test their equilibration, such as making them turn sharply, balance themselves now on one leg, now on the other, etc.; and my experience leads me to believe that deficiencies may thus be detected which otherwise might escape observation, and be put down in clinical records as non-existent.

THE IMMEDIATE CURE OF INGUINAL HERNIA BY A NEW INSTRUMENT.

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WHEN we consider for a moment the enormous number of cases of hernia met with in practice—those applying to the truss societies of London alone numbering over nine thousand a year—it seems strange that so little comparatively has been accomplished in attempting to cure such cases permanently. Most surgeons seem to rest contented with some palliative measure, which, sooner or later, is tolerably certain to be found wanting at the critical moment, when strangulation is about to take place. The ancients were in their generation somewhat wiser; for, fifteen hundred years ago, the operation for radical cure was comparatively common; and long before that (about B.C. 400), Hippocrates described the operation, which, for aught we know, may have been practised even before his time.

The different methods which have been practised for the immediate or radical cure of hernia may be roughly classed under four heads, viz.: 1. Contraction of skin and sac by excision, cautery, or ligature; 2. Closure of the sac by adhesive inflammation; 3. Plugging the inguinal canal; 4. Bringing the walls of the canal together.

1. Among the old surgeons, the first method was the only one employed. Celsus says that, in his day, the surgeon opened the sac with a sharp instrument, took hold of it, and, after putting back the intestine, cut the sac, then tied the spermatic cord and removed the testicle. He then took away part of the scrotum, and reunited the lips of the wound, so as to form a firm cicatrix.

Paulus Aegineta followed Celsus, but ligatured the sac before cutting it, and sometimes applied the actual cautery also; and, in cases of bubonocoele, he advocated cautery alone, applied to the skin sufficiently to penetrate the parts beneath—"being guided as to its extent", he says, "by a skilful conjecture".

Oil of vitriol used as a caustic, by being repeatedly applied over the inguinal ring until it penetrated all the soft tissues, was in vogue in the early part of last century, and was as barbarous as it was ineffectual.

Another plan, invented by Berault, was styled the *punctum aureum*. The rupture was reduced, the sac laid open, taken hold of with pincers, and a gold wire passed through it, which was then twisted and cut off. Other kinds of wire were subsequently employed by other surgeons. At the best, this operation could only convert a complete into an incomplete hernia; but it appears seldom to have effected even so much. About this period, a much more barbarous modification of this operation was in vogue among the Turks, which is fully described in Arnaud's work.

2. Of the second series, the best example is that of the seton. Various substances have been employed with the object of setting up inflammatory action in the interior of the sac, so as to cause the sides to adhere, and so prevent protrusion of the bowel. Silk threads, sponge, injection of irritant fluids of various kinds, were at different times employed for the purpose by various surgeons. The method, by whatever variety of practice carried out, appears to have been even less efficacious than the barbarous practice of the ancients, and almost, if not quite, as dangerous.

3. In the third class, Wurtzer's operation affords the best illustration; that of Gerdy being very similar. In the latter, the skin of the scrotum with the fundus of the sac is invaginated by the finger of the operator into the inguinal canal, and a curved needle armed with thread is passed through the skin of the groin on each side of the finger, and the skin retained in its place by means of the suture until it becomes adherent. Sometimes caustic ammonia was used, in order more certainly to obtain union between the two invaginated skin-surfaces. Wurtzer used, instead of the finger, a wooden plug, retained *in situ* by means of needles passed through the skin at its extremity, and fixed externally to a corresponding piece of wood, so placed as to produce sufficient compression of the intervening tissues as to secure their adhesion to each other.

The records of successes after these measures are, I believe, comparatively few; and I have myself seen some instances in which the rupture has been made seriously worse by Wurtzer's operation.

4. The fourth plan differs materially from the foregoing, in providing the remedy which Sir W. Lawrence pointed out as being required to contract the tendinous opening (*Treatise on Ruptures*, by W. Lawrence, 1816, p. 94). The idea of bringing together the pillars of the inguinal ring in such a way as to restore the normal valve-like shape, is based on true anatomical principles, and to Mr. John Wood must be ascribed the great credit of having reduced these to valuable practical results. Wood's operation, however, consists not merely in approximating the pillars of the ring, but in the subcutaneous invagination of the tissues which are intended to fill up the abnormally expanded opening. Stress is laid by Mr. Wood on the fact that, "to ensure success, complete union must be established along the whole length of the canal" (*On Rupture*, by John Wood, p. 88). This statement first led me to consider how far it might be feasible to secure such a result with greater simplicity and certainty. It will be observed that, in using the wire sutures of Mr. Wood, as ordinarily applied, a hold is secured on the pillars of the ring at two points only, while the invaginated tissues are

Fig. A.—Copied by permission from Mr. Wood's work *On Rupture*, p. 113.

forcibly drawn up in such a way as, in some measure, to defeat the object the surgeon has in view, of approximating the sides of the canal as much as possible. By means of the operation I propose, you will see that these drawbacks are overcome. The points of

Fig. B.

security are multiplied, and the invaginated plug, being rather cylindrical than conical, is retained in position in such a way as to permit the walls of the canal to come as close together as possible. The in-

Fig. 1.

struments* required are very simple—a thin strong knife, like a tenotomy knife, for separating the skin from the subjacent tissues; and the screw instrument (Fig. 1), shaped like a corkscrew, with a flat-point and

* These instruments made for me by Evans and Woodall, Stamford Street, Blackfriars.

movable handle, nickel-plated. The screw is made rather broader near the point, tapering somewhat towards the handle, and should be sufficiently strong not to break, but yet as thin as may be consistent with strength. The instruments in box are represented in Fig. 2.

The mode of performing the operation in a case of ordinary oblique inguinal hernia is as follows. The patient must be in good health, have an aperient the day before, and an enema on the morning of operation. If necessary, the pubes must be shaved. Under the influence of an anæsthetic, the hernia is carefully reduced, and not allowed to come down during the operation. An incision is made in the skin of the scrotum large enough to admit the forefinger easily, over the fundus of the hernial sac, generally about two inches below the spine of the os pubis; and the skin is separated from the parts beneath by means of the blade or handle of a narrow scalpel, to an extent determined by the size of the hernia, and that of the inguinal canal. The operator standing on the left-hand side of the patient, the forefinger of the left hand is passed up to the internal abdominal ring, invaginating the fascia and hernial sac to the same extent. A careful examination is now made of the surrounding structures, the position of the vessels clearly made out, the size and shape of the abdominal rings noted, as well as the length of the canal. This is necessary, in order to have an instrument of the proper size. The left forefinger being retained in the

The amount of induration excited will be the guide as to the time for removal of the instrument; but a week has been usually found sufficient. The removal of the instrument is easily effected, as the suppuration which takes place along its course serves to loosen it somewhat; and by keeping it well oiled from day to day, it is easily withdrawn. The wounds will readily heal under any simple dressing, with pad and bandage. A truss may be worn for a time, as the adhesions will of necessity not be very firm at first; but, in most of the cases I have operated on, this has been dispensed with without any ill results.

The aim of the operation is to bring together the pillars of the hernial canal, and at the same time to plug the opening in such a manner as to shut it off from the peritoneal cavity on the one hand, and, on the other, to form an impassable barrier against any further descent of the bowel. So long as the general peritoneal cavity is not interfered with, so far is danger averted; and, if the hernial canal be effectually closed throughout, so to the like extent is the cure complete.

The operation is simplicity itself to anyone accustomed to operative surgery; and, with regard to the danger attending it, I can only say that it has now been performed by myself and my colleagues in thirteen cases, in not one of which has any serious symptom been observed, the highest temperature recorded being 101.2° Fahr.; and, in eleven of the cases, the cure has been complete; in the remaining two, the patients

Fig. 3.

Fig. 2.

Fig. 4.

hernial canal, protecting the spermatic cord, and at the same time closing the internal ring, the screw instrument, previously dipped in carbolic oil, is, with the right hand, thrust through the skin of the groin so as to transfix the aponeurosis of the external oblique muscle, at a point somewhat above that at which it is intended to pass through the conjoined tendon. Having given the instrument one half-turn to the right, if a right inguinal, and a whole turn if it be a left hernia, it is next made to pierce subcutaneously the conjoined tendon of the internal oblique and transversalis muscles as high up as can safely be reached, the left forefinger carefully guarding the point, so as to avoid wounding the vessels or peritoneum. This part of the operation must be executed cautiously and deliberately. It will be then found that, as soon as a hold has been secured by the instruments the internal ring is practically closed. Another turn is now given to the screw, causing it to pass through the invaginated tissue—whether consisting of fascia or sac, or both—and it is again passed through the external pillar, and then across to the internal pillar of the external ring, and another turn given if possible, so as to bring the point out at the wound in the scrotum. The handle should then lie flatwise on the abdomen, and the point of the instrument be protected by a round piece of solid India-rubber, or by winding round it some carbolised gauze. A light pad is then placed over the part, and a bandage carefully applied.

The operation may be performed under Lister's antiseptic method, as in two of the cases (IV and VII) I have to record; but it is well then to leave the instrument *in situ* rather longer. The results are equally satisfactory if this precaution be observed, and there is, of course, less danger from any septic influence.

The subsequent treatment is very simple. After a period varying from a week to a fortnight, a certain amount of inflammatory action will be observed along the line of the inguinal canal where the instrument lies, and more or less discharge takes place from the wounds.

have been greatly benefited. I think, therefore, I am justified in saying that it is a simple, a safe, and a very efficient method of curing suitable cases of hernia.

I append a record of all the cases in which the operation has been performed up to the time of writing this paper.

[To be continued.]

THE TREATMENT OF CARBUNCLE.

I BEG to corroborate Dr. Eade's good report of carbolic acid, locally applied, in the above complaint; but, in addition to this, I think iodine painted night and morning around the edge of the sore—with, of course, a linseed-poultice over all—materially contributes to the good effect. I have never known this plan to fail; although, in two of my cases, the carbuncle has been situated on the face, where it is reputed to be commonly fatal.

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ANÆSTHESIA BY RAPID BREATHING.

I WAS fortunate enough yesterday to have an opportunity of adopting the new method of analgesia (mentioned in the JOURNAL of October 16th), in cutting out a fatty tumour, of the size of a small walnut, from over the anterior upper fifth of the tibia. The leg, only grasped by a hand at the ankle, did not move throughout the dissection over the tender region of "the shin". The patient, who was nervous, very anæmic, and debilitated from the effects of severe ague, avers that "he felt nothing except the stitching"; and I could not have ventured to use chloroform, being alone; the patient's condition also rendering this anæsthetic inadvisable.

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Punjab, November 11th, 1880.