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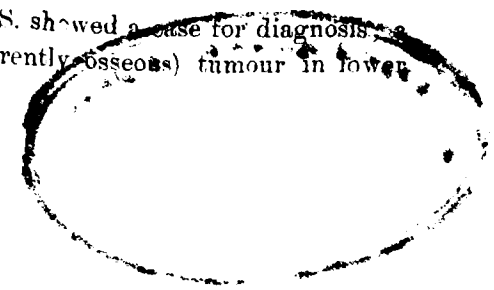
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W. R. BROWN, I.M.S. IN THE CHAIR.

BUSINESS.

The minutes of the previous meeting were read and confirmed.

Lieut.-Colonel Sturmer, I.M.S. showed a case for diagnosis of a woman with a large hard (apparently osseous) tumour in lower



MARCH MEETING.

The usual Monthly Meeting of the Branch was held in the Government Museum, Egmores, on Thursday 28th March at 5-30 P.M.
The President, SURG.-GENERAL D. SINCLAIR, I.M.S. IN THE CHAIR.

BUSINESS.

The minutes of the previous meeting were read and confirmed.

Surg.-General Sinclair, I.M.S. made a few opening remarks in the course of which he thanked the members of the Branch for having elected him as President.

Lieut.-Colonel Reeves, I.M.S. then showed a patient on whom he had operated for fractured patella by wiring the two fragments together. He remarked that fracture of the patella was a comparatively rare accident in this country, and that he had only seen one during his service in India.

Major A. E. Grant then read a paper opening a discussion on Typhoid Fever, with special reference to the etiology of the disease.

In the discussion which followed the following members took part:—Surg.-Genl. Sinclair, Lieut.-Col. Walker, Captain Elliot, Lieut.-Col. Sturmer, Assist.-Surg. C. B. Rama Row.

As it was then late in the evening it was decided to adjourn the remainder of the discussion till some future date.

Lieut.-Colonel Walker proposed, and Mr. McCauly Hayes seconded, a vote of thanks to Major Grant for the able manner in which he had opened the discussion.

The meeting then terminated.

APRIL MEETING.

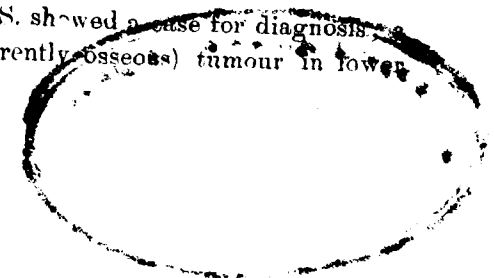
The usual Monthly Meeting was held in the Government Museum, Egmores, on Friday 26th April.

LIEUT.-COLONEL T. L. DROWN, I.M.S. IN THE CHAIR.

BUSINESS.

The minutes of the previous meeting were read and confirmed.

Lieut.-Colonel Sturmer, I.M.S. showed a case for diagnosis of a woman with a large hard (apparently osseous) tumour in lower



occipital and upper cervical regions. No definite diagnosis was arrived at.

Captain Niblock, I.M.S. showed a case of tubercular glands of neck and axillæ simulating Hodgkin's Disease.

Lieut.-Colonel Reeves, I.M.S. then read his paper on "A new method for circumcision".

The Honorary Treasurer read Major Simpson's "Notes on a case of Intestinal Obstruction".

Remarks were made on both papers by Lieut.-Cols. Brown, Maitland, and Sturmer, by Major Robertson and Captain Niblock.

The Meeting then terminated.

JUNE MEETING.

An Extra Meeting of the Branch was held in the Government Museum, Egmore, on Friday 14th June, at 5-30 P.M.

LIEUT.-COL. T. H. POPE, I.M.S., IN THE CHAIR.

BUSINESS.

The minutes of the previous meeting were read and confirmed.

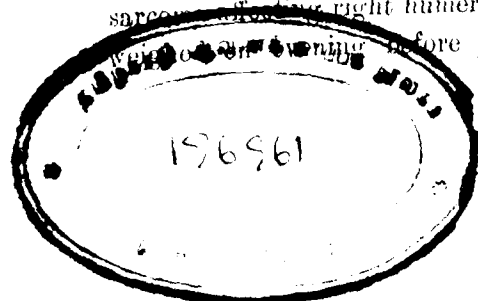
Owing to the small number of Members present it was decided to postpone the main business of the meeting, viz., the passing of a resolution of sympathy with Mrs. Walker, widow of the late Lieut.-Col. Walker I.M.S., until a larger number of Members could be got to attend.

Captain Niblock, I.M.S., then showed three patients on whom he had operated for the following conditions, and read notes of the cases:—

CASE I. *Cancer of rectum*.—Perineal excision of 5½ inches of rectum, the lower 5 inches of which were free from peritonæum. Results satisfactory.

CASE II.—*Gastrotomy* for removal of foreign body (tooth-plate) from oesophagus. The tooth-plate was firmly impacted two inches above cardiac orifice of stomach, and was removed by the fingers after the hand had been introduced into the stomach.

CASE III.—*Interscapulo-thoracic amputation* for removal of sarcoma affecting right humerus and scapula. Patient and tumour weighed on evening before operation 137 lbs.; tumour when



weighed after operation 48 lbs.; weight of patient a month after operation 95½ lbs. The wound healed without any difficulty and the sutures were removed on 13th day after operation.

The meeting then terminated.

JULY MEETING.

The usual Monthly Meeting was held in the Government Museum, Egmore, on Friday 26th July at 5-30 P.M.

LIEUT.-COL. STURMER, IN THE CHAIR.

BUSINESS.

The minutes of the previous meeting were read and confirmed.

Captain Niblock I.M.S., showed the following cases:—A man with ankylosis of elbow the result of fracture of lower end of humerus. An unusually large amount of callus was present, and the elbow had ankylosed with the arm extended. There was partial paralysis of ulnar nerve.

(2). A boy on whom he had operated almost two months previously for ascites, by suturing omentum to anterior abdominal wall: up to date there was no recurrence, although previous to operation the boy had had to be tapped weekly.

The following papers were then read by the Honorary Secretaries:—

(1) "Two varieties of volvulus with untwisting and recovery, with some surgical notes from Mofussil practice." By Captain C. L. Williams, I.M.S., Ootacamund.

(2) "Notes on a case of Pyloric obstruction for which gastro-jejunostomy was performed." By Lieut.-Col. W. Lee, I.M.S. This paper was accompanied by the specimen of the stomach and jejunum showing the Murphy's button—used for the anastomosis—in situ.

Remarks were made on the cases and papers by Lieut.-Col. Maitland and Sturmer and Captain Niblock. The papers by Mr. Molesworth and Niblock.

The following Resolution was proposed by LT.-COL. MAITLAND, seconded by DR. RUNGAPPAH, and passed unanimously:—

"The Members of the South Indian Branch, British Medical Association, desire to convey to Mrs. Walker an expression of their deep sympathy with her in the bereavement she has sustained in

the loss of her husband, the late Lieut.-Colonel Walker, I.M.S., who for several years past had served as one of the Council of the Branch Association. The Members of the Association feel assured that it will be some consolation to Mrs. Walker in her affliction to know that Colonel Walker enjoyed in a high degree the respect and esteem of his professional brethren in Madras, by all of whom his death is deeply regretted."

The meeting then terminated.

AUGUST MEETING.

The usual monthly meeting of the Branch was held in the Government Museum, Egmore, on Friday 30th August at 5-30 p.m.

LT.-COL. W. R. BROWNE, I.M.S., IN THE CHAIR.

BUSINESS.

The minutes of the previous meeting were read and confirmed.

Capt. Niblock, I.M.S., read his paper "Notes on Hernia operations." In the discussion which followed Lt.-Cols. Sturmer, Maitland and Browne took part.

Capt. Cornwall, I.M.S., read his paper on "The Etiology of Vaccinia." Capt. Gabbett and Asst. Surgeon C. B. Rama Row made some remarks.

The meeting then terminated.

The incision is then continued through the superficial fascia and fat, care being taken to clamp all vessels either before division or as soon after as possible, as it is of the utmost importance to keep the wound free from blood and as dry as possible

NOTES ON HERNIA OPERATIONS.

BY CAPT. W. J. NIBLOCK, M.B., I.M.S.

A.—Operations for radical cure of reducible inguinal hernia.

During the past two and a half years I have operated, in the General Hospital Madras, for radical cure of reducible inguinal hernia sixty-nine times. Before going on to the main part of the subject of this paper, I think it better to give an idea as to the sort of patients operated on, and the variety of hernia encountered—

Race of patients—Hindus 55, Mussulmans 3. Eurasians 7, Europeans 4.

Age.—Between	12 and 20	...	10 patients.
	21 „ 40	...	45 „
	41 „ 50	...	12 „
	51 „ 60	...	2 „

Sex—All were males. Side—57 were on right side.

Variety	...	Congenital	...	15
		Not congenital	...	54

The great majority of the cases were complete scrotal herniæ; I regret that an exact record of this particular has not been kept, but should think that about 90 % were complete.

The operations performed on these 69 cases were:—

(a) Bassini	...	...	...	...	7
(b) Modified Bassini	...	...	...	...	43
(c) „ „ in which cord was not transplanted	...	...	...	...	10
(d) Halstead	...	...	...	...	2
(e) Ball's Operation	...	...	...	...	2
(f) Miscellaneous—chiefly to enable patient to wear the cord,	...	...	...	...	

I propose first describing the operation and behind the sac, formed by me and which is referred to as the sac lower down in the canal than Bassini's. One has also to remember that the object is to separate the sac from the cord, and not the cord from the sac. The best way to separate the sac is to grasp it in a pair of catch-forceps taking care that the sac and not the cord is caught, it is then separated, beginning as near the internal ring as possible by means of dissecting forceps and the fingers. In con-

before operation a dose of castor-oil is given, and an ordinary soap and water enema in the morning at least 2 hours before operation.

Local Preparation.—The skin is shaved carefully for at least 5 inches all round the proposed line of incision, then scrubbed with soap and warm water, then rubbed with turpentine, and finally with Perchloride of Mercury Solution (1 in 500). A pad of gauze soaked in 1 in 2000 Perchloride of Mercury Solution is then bandaged over the part and not removed until the patient is on the operating table.

In the Operating Theatre the pad is removed, the parts again thoroughly rubbed with turpentine and washed with a solution of 1 in 2000 Biniodide of Mercury in Methylated Spirit.

Instrument and sponges.—All instruments used at the operation are boiled in water to which baking-soda has been added (a drachm to the pint). They are then placed in a tray containing Formaline Solution (1 in 400) and kept there during the operation when not in use.

Artificial sponges which have been previously boiled are used wrung out of Biniodide of Mercury Solution (1 in 4000). This solution has the advantage of not coagulating albumen, and thus one or two small sponges will be found to be ample for the operation.

Skin Incision.—Poupart's ligament is first felt for by the tips of the fingers of the left hand, and is always easily made out, even in the fattest patients, as a tense hard cord. An incision is made $\frac{3}{4}$ inch above and parallel with it, commencing just outside the situation of the internal abdominal ring and continued inwards for about two inches; in thin patients less than this— $1\frac{1}{2}$ inches—will suffice, whilst in fat persons it may be necessary to make it 3 inches, or, in order to give room for subsequent manipulations,

a short incision in the above situation are (a) less bleeding; (b) risk of sepsis; (c) pressure can be more easily put on than if the incision reached as far as the external ring.

The incision is then continued through the superficial fascia and fat, care being taken to clamp all vessels either before division or as soon after as possible, as it is of the utmost importance to keep the wound free from blood and as dry as possible

during the operation. Provided that a short incision be made as described the only vessels likely to give any trouble are the superficial epigastric; if it be prolonged inwards as far as the external abdominal ring the superficial external pudic vessels will also be divided, and sometimes give rise to troublesome bleeding owing to their being concealed in the inner end of the wound. All vessels met with are clamped with pressure forceps which are allowed to remain on till near the end of the operation.

Opening the canal.—The external oblique aponeurosis is now carefully exposed and cleaned, when its fibres will be distinctly seen running downwards and inwards. The aponeurosis is separated *in line with its fibres* about $\frac{3}{4}$ inch above Poupart's ligament, but must not be cut on any account. It has been proved that this separation does not weaken the abdominal wall in the slightest degree, a fact which is easily understood when one remembers that contraction of the muscle tends to bring the fibres closer together. Some fibres of the inter-columnar fascia, which runs in the opposite direction (*viz.* upwards and inwards) will require to be cut across, but are of little importance.

After the aponeurosis has been divided to the full extent of the wound—taking care not to cut into the external abdominal ring, it is carefully separated from the underlying structures by the handle of a scalpel, and drawn out of the way. The sac will now be generally seen in the lower part of the wound: it is, however, occasionally covered by the cremaster muscle which may require to be separated before it can be seen. At the outer end of the canal it is covered by the arching fibres of the internal oblique and transversalis muscles. These should on no account be divided but simply pushed out of the way.

Treatment of sac.—The next step consists in separating the sac from the cord. In doing this one should remember that the cord, with its vessels, is almost always situated below and behind the sac, and that it is more closely adherent to the sac lower down in the canal than near the internal ring. One has also to remember that the object is to separate the sac from the cord, and not the cord from the sac. The best way to separate the sac is to grasp it in a pair of catch-forceps taking care that the sac and not the cord is caught, it is then separated, beginning as near the internal ring as possible by means of dissecting forceps and the fingers. In con-

genital hernia the separation is more difficult and it may be necessary to use scissors. After the sac has been carefully separated all round a short incision should be made in it in a longitudinal direction, in order to examine the interior and to see whether it is empty or not. This is important, as if the sac be divided without opening it damage may be done to some important structure inside; thus I have had two cases in which the sac, before opening, was apparently empty and yet on examining the interior the vermiform appendix was found adherent to the wall of the sac by its tip and would undoubtedly have been cut across had the sac been divided without opening.

If omentum be found in the sac—it was so present in six of my cases—it should be carefully drawn down, ligatured, and excised. During May of this year Colonel Maitland mentioned to me that he had recently been in the habit of looking for omentum inside the ring in those cases where it was not present in the canal, and then drawing it out and excising it in the ordinary way. Since he told me this I have in every case carefully fished inside the ring, either with a finger or with dressing forceps; and when omentum has been thus discovered, have drawn it down and excised it. In thirteen patients on whom I have operated recently omentum could be easily drawn down in nine. This procedure I think a valuable one as it stands to reason that the omentum is much more likely to cause a recurrence of the hernia than is the intestine itself owing to its being able to act as a wedge. It is worth noting in this connection that in most cases of strangulated inguinal hernia omentum is to be found, in fact it often forms the greater part of the strangulated mass.

As regards ligation of the omentum I think it almost always preferable to use interlocking sutures, even where the omentum is small. Care must be taken not to drag on the omentum too roughly, and also to see that no veins are injured whilst passing the sutures. In several cases in which I used simply an ordinary transfixion suture the patients complained of rather severe pain in the epigastric region: this has not been noticed when the interlocking sutures were used. As to the material, I am in the habit of using catgut.

After the sac has been emptied, and its contents, if any, disposed of, it is clamped and divided between forceps. The distal

part is carefully separated from the cord as far as the external ring, is ligatured with catgut and cut off, the lower end dropping into the scrotum.

The proximal end of the sac is next carefully separated from the surrounding structures, especially where it passes through the internal ring, and is ligatured with strong silk after transfixion of the stump, (either by a double interlocking suture or a Staffordshire Knot) the ends of the ligature being left long. The stump is then pushed into the abdomen and fastened there, immediately underneath the transversalis fascia, as follows:— One of the ends of the ligature is threaded on a MacEwen's needle and, guided by the left index finger, is passed through the ring until it reaches a point about an inch above and external to it. All the structures of the abdominal wall except the skin are then transfixed and the thread is drawn out superficial to the external oblique aponeurosis. The other end of the ligature is passed similarly about half an inch from the first one. The ligatures are then gently pulled on until the stump is found to be closely adherent to the wall inside. They are then tied, the knot lying immediately underneath the skin. I have never heard of this knot giving any after-trouble.

Treatment of the cord.—After the sac has been thus disposed of the cord is examined. If varicocele or lymphangiectasis be present (the former was present in fifteen, the latter in one, of my cases) the veins or lymphatics are clamped, ligatured and excised, the proximal end being pushed inside the ring, the distal into the scrotum. During this part of the operation bleeding must be carefully looked for.

Re-construction of the inguinal canal.—This is the main part of Bassini's operation. The inguinal canal runs from the internal to the external abdominal ring. The so-called internal ring is not really a ring in the normal state, but simply a passage large enough to allow the cord to pass from the abdominal cavity into the inguinal canal. It is formed above by the arciform fibres of the internal oblique and transversalis muscle which spring from Poupart's ligament and arch over the beginning of the cord to unite with the conjoint tendon (*vide diagram*.) These fibres have a most important action which has been likened to that of a valve; thus when the abdominal walls relax the ring relaxes, but when the muscles act (*i.e.* just at the time when there is the great-

est risk of rupture owing to increased intra-abdominal pressure) the fibres forming the ring press tightly on the cord and prevent the escape of any of the contents of the abdomen. If, however, from any cause a hernia come down it tends to press these fibres upwards and prevents them from acting properly. One of the chief aims of Bassini's operation is (after removing the sac and placing the stump inside the abdomen) to restore the proper action of the valve. This is done by suturing the arciform fibres to Poupart's ligament, *under* the cord, as follows:—The cord is first lifted up and held out of the way by an assistant—the most convenient way to do this is to pass a loop of catgut round it which the assistant holds. The sutures are then passed (as shown in diagram No. 3,) by means of a Lockwood's needle, or a curved Hagedorn on a needle holder. (I prefer the former as it is blunt and less likely to damage any important structures.)

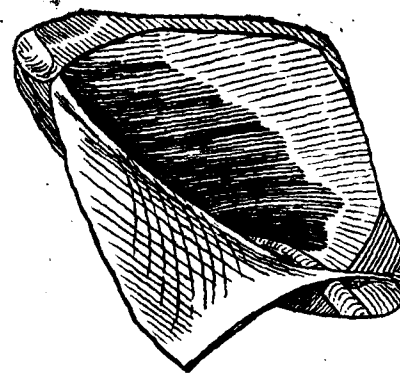
The first suture is passed above through the internal oblique muscle and should almost touch the cord when the latter is held vertically to the plane of the abdomen; below, it is passed through the shelving part of Poupart's ligament. The other sutures are passed to the inner side of this in a similar manner so as to close the opening between the arciform fibres and Poupart's ligament completely, just leaving room for the cord to pass out. Two or three sutures are usually needed, and they are placed about a third of an inch apart. If the internal ring still appear rather slack an additional suture may be passed to its outer side *over* the cord.

Closure of canal and of skin incision.—The cord is now allowed to drop back into the canal and the external oblique aponeurosis carefully united by a continuous suture. The vessels which were clamped at the beginning of the operation may now be twisted, and the forceps removed. No ligatures are required for them. The

aponeurosis carefully brought together by fishing gut or horse-hair, skin sutured without drainage.

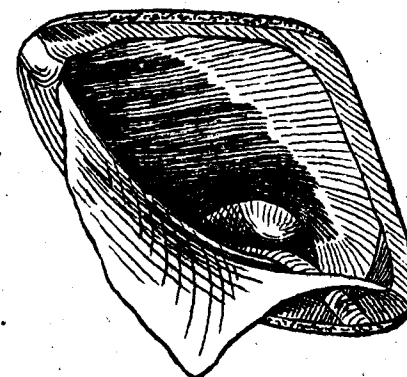
Dressing.—Sterilized gauze squeezed almost dry out of formalin solution (1 in 400) is placed on the wound, covered by a few layers of absorbent cotton-wool, and this again by an ordinary cataplast, and the whole firmly bandaged. Over this a plaster serves to keep the dressings clean and its contents, if any, discharge firm. The dressings do not require to be changed between forceps. The distal when the sutures are removed.

DIAGRAMS ILLUSTRATING "NOTES ON HERNIA OPERATIONS"



No. 1. Showing normal condition of internal ring.

No. 2. Showing internal ring in a case of hernia. Arciform fibres pushed upwards by the sac.



No. 3. Showing insertion of deep Bassini sutures; the cord is lifted up out of the way.

(Two or three sutures are generally sufficient).

[After Lockwood.]

After treatment.—The patient is placed on slop-diet for a few days and then gradually allowed back to his ordinary food.

In many cases some pain in the small of the back or the epigastric region is complained of but usually passes off in a few days. The bowels are generally opened on the third day, but there is no objection to their acting sooner.

The patient is kept for at least three weeks in Hospital after the operation.

No truss should be worn after the operation, as it is calculated to do more harm than good.

Other operations.

Modified Bassini without transplantation of cord.—In this method, which I have carried out in ten cases, the arciform fibres are sutured to Poupart's ligament *over* the cord. This appears to be very applicable to certain cases, especially when the internal ring is fairly small. It has the advantage of requiring less manipulation of the cord, but the disadvantage of having the ring moved downwards and inwards to a position where possibly recurrence might more easily take place than in the ordinary Bassini. This is, however, simply conjecture on my part, and has not been substantiated.

Bassini's operation—as performed by himself. This I have done in 7 cases. He takes no special precautions with regard to the sac except to return it inside the abdomen. It is suitable for small incomplete herniæ with small internal rings.

Halstead's operation. This differs from Bassini's as follows (1) The internal oblique and transversalis muscles are cut through three quarters of an inch external to the internal abdominal ring, and the cord brought out at the upper end of the wound; (2) all the veins of the cord, except one or two, are excised; (3) ~~the cord is brought out over the external oblique aponeurosis just under the skin. I have done this operation in two cases.~~ It has the following objections.—(1) The cutting of the internal oblique and transversalis muscle ~~weakens~~ the abdominal wall considerably (2) In several ~~cases~~ atrophy of the testis has followed owing to excision of the veins. [O'Connor reports 20% atrophy of testis in 129 cases operated on by Halstead's method.] (3) The cord is more exposed than in Bassini's operation, and more likely to be injured.

Ball's operation. This I did in my first 2 cases—never since. The chief point in it is the twisting of the sac, in order to obliterate the peritoneal pouch and this I often do in the modified Bassini just described.

Miscellaneous operations.—In five cases I have performed operations in cases of large reducible inguinal hernia, simply to enable the patients to wear a truss. Most of the cases were complicated with elephantiasis scroti. In these the sac was generally closed by a purse string suture, fastened inside the abdomen, and the large "ring" closed by sutures running from the oblique muscles to Poupart's ligament. In two of the cases castration was performed and the ring completely closed.

MacEwen's operation. This I have not done but it is stated on good authority that "the brilliant results of MacEwen have not been generally obtained by other surgeons attempting to operate by his method." The chief danger seems to be sloughing of the large stump.

Results of operation.

(a) *Mortality.*—All my cases recovered: the death percentage after Bassini's operation is practically nil.

(b) *Immediate results.*—In my last 31 cases of reducible hernia treated as above described every case has healed by first intention without a trace of suppuration. In my earlier operations suppuration was not at all infrequent, and was I believe often due to too strong lotions and tying the sutures and ligatures too tightly.

(c) *Remote results.*—I think it is generally admitted amongst surgeons that Bassini's operation with certain modifications is the most successful one performed at the present time. As regards my own cases I have not seen a relapse, but the number of operations I have performed is too small and the time since I commenced is too short for me to give my opinion on this point. Also the patients in this country are rarely seen again after operation, although one is much more likely to hear again of unsuccessful and relapsing cases, than of those in which perfect cure has taken place. With regard to relapse. Bull and Coley, in the new "International Text-book of Surgery" Vol. ii, Page 498, state as follows. "The results of our observations based upon a study of 360 cases of relapsed hernia following various methods of operation, throw

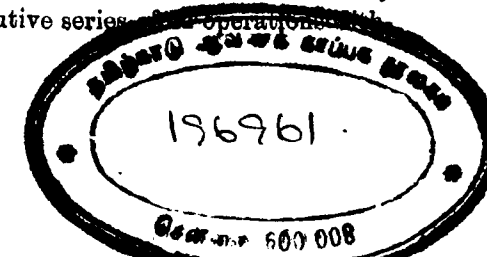
valuable light upon the question as to the period when relapse is most likely to occur. We have found that 80 per cent. of these relapses occurred during the first year after operation; 64.5 % during the first six months following operation; while but 11.9 % occurred after a period of 2 years had elapsed. . . . In 100 out of 360 cases of relapsed hernia the operation was done for strangulation. The average period of relapse after operation was found to differ but little in the strangulated and the non-strangulated cases. Thirty-one cases were femoral and 229 inguinal. In 71 % of the cases of relapses the age of the patient was over 30 years; in 29 % under 30 years. . . . From these facts we are, we think, justified in concluding in a general way that, if a rupture is sound at the end of one year after operation, there is reasonable prospect of permanent cure; while if it remains well for two years the chances of relapse are exceedingly small though it is not impossible that relapse may occur as late as 20 years after operation. Ninety-five per cent. is probably a conservative estimate of cases following Bassini's operation when properly performed. Of our personal cases we have treated upwards of 200 that have remained free from relapses for periods ranging from 2 to 8 years after operation. One of the writers has had but 5 relapses in 549 cases operated upon by Bassini's method. Ninety-six per cent of the cases healed by primary union."

The points favouring relapse are, according to Lockwood, (1) operating on improper cases, (2) inefficient or bad operating, (3) suppuration, (4) exertion too soon after operation, (5) accident.

Sutures and ligatures:—as regards these there is great difference of opinion.—some operators use silk, others chromicized catgut and others kangaroo-tendon. The objection to silk is that it is non-absorbable and therefore may act as a foreign body in the wound, cause a sinus and come away weeks, months, or even years after. The same applies to fishing gut and all other non-absorbable sutures. As regards catgut Spencer states that it sometimes sets up severe suppuration. This has been my experience in several cases so that I have discarded it altogether.

Mr. Lockwood states:—"For more than ten years I have used twisted silk for ligatures and buried sutures. . . . Out of 45 operations. . . . done betwixt January 1895 and July 1896 one case parted with one suture and one with several, the rest healed by first intention. I have had a consecutive series of operations with

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out a suppuration." He concludes "although I have had opportunities of judging I have not seen better results than these from any kind of prepared catgut, kangaroo-tendon, or other materials."

Mr. Jacobson states:—"Though hitherto I have used silk I am of opinion that kangaroo-tendon, if a suitable specimen, duly sterilized, can be obtained, will be found preferable, and I intend to make trial of this in future Silk is most satisfactory to work with at the time But the after result is, in my opinion, less satisfactory owing to its liability to come away often presistently . . . I am aware that many surgeons, higher authorities than myself, claim that silk, wire, salmon-gut can all be used, as buried sutures without any further trouble. In a certain and large proportion I know from experience that silk can be used, but in a considerable number, this and the other materials most certainly cause trouble later on. The wound runs an aseptic course, heals without suppuration, and then, after a varying period, a sinus appears, and one or more of the sutures have to be removed."

Mr. Barker gives the results of 200 consecutive operations for radical cure (with 3 deaths). He used silk, and in 20 cases sutures came away at one time or other. Bull and Coley have ceased using silk for buried sutures. They now use kangaroo-tendon.

The only buried sutures of which I have had personal experience are chromicized catgut and silk. The chromicized catgut (even after most careful sterilization) caused suppuration so frequently that I had to cease using it. The silk is sterilized by boiling immediately before use and certainly gives most satisfactory results at the time, but I have heard recently of a few of my cases which had originally healed by first intention and from which the silk was extruded several months after operation. I am therefore inclined to think with Jacobson, Bull, and Coley, that the most satisfactory of all sutures would be carefully prepared kangaroo-tendon which has given good results both immediately and remote in the hands of several surgeons, and which I shall use as I can get a suitable supply.

Complications.—The chief complications I have met with are elephantiasis scroti: hydrocele: hæmatocele: varicocele: lymphangioectasis: enlarged inguinal glands.

In cases of elephantiasis scroti with hernia I make it a rule to operate on the hernia first, and then after the hernia wound has thoroughly healed, the elephantiasis is operated on in the usual way. The other complications call for no special remarks.

B. Operations for irreducible inguinal hernia.

I have operated on nine cases of irreducible inguinal hernia in all of which the hernia was of large size, generally as large as a child's head. The ages of the patients were as a rule between 40 and 55, the two exceptions being aged 30 and 36 respectively. All were in Hindus. One was double, the others were all situated on the right side. Four were complicated with large elephantiasis scroti.

Operation.—In most of the cases operation was performed with the view of enabling the patient to wear a truss, and resembled that described for large reducible herniæ. In four cases the sac, or the greater part of it, had to be reduced along with its contents owing to the impossibility of separating the adhesions.

Contents of sac.—With one exception (in which colon and omentum only were found) the sac contained lower portion of ileum, caecum, part of colon, and omentum.

Result of operation.—In all the cases operated on a truss was recommended, as a real 'radical cure' was impossible owing to the enormous dilatation of the ring and marked thinning and atrophy of the muscles met with in all the cases. Stitch suppuration occurred in three cases.

In these operations the after result must be unsatisfactory, partly for reasons detailed above and also on account of the great risk which the patient runs of intestinal obstruction due to the return to the abdomen of coils of intestine matted together as they generally are in these cases; the danger of obstruction must be greatly increased in cases where the sac, or part of it, has had to be pushed into the abdomen.

Mortality after operation.—I am unable to obtain statistics showing cases so that I am unable to obtain statistics showing mortality after operation for irreducible hernia, but most writers to the subject state that the mortality is much higher after operation for large irreducible hernia, than after operation for cure of reducible cases. Out of my nine cases I have had the misfortune to lose one—my first case.

The following are extracts from notes taken at time of operation on this case:—

"Double irreducible inguinal hernia, in a man aged 50, complicated by a large elephantoid scrotum."

The hernia on left side contained about 8 feet of small intestine with caecum, part of colon, and omentum. That on the right contained large intestine: both were irreducible. Part of the sac had to be reduced with the gut on both sides as separation was impossible. The utmost difficulty was experienced in getting the bowel back into the abdomen as there did not seem to be room for it [this latter is an additional danger in these cases.] Patient was removed from the operating theatre in a state of intense shock from which he never rallied."

I cannot end this part of the subject better than by quoting the following extract from a paper by Mr. Coley in "Annals for Surgery," March 1897. He states—"I would caution against operating on very large irreducible hernia, especially in stout persons. The operation is a formidable one, on account of the numerous adhesions and the necessity of ligating large masses of omentum, and aside from the danger attending the operation itself, my observation of the results of operation in such cases has convinced me that few are permanently cured." I agree with every word of the above, but still there are some cases where one must operate, as otherwise the patient's life is bound to be spent in the most abject misery, with the possibility, and probability, of the hernia becoming incarcerated or strangulated at any time. It is also necessary in cases complicated by elephantiasis scroti in which one wishes to remove the latter. In a certain number of cases *enterectomy* may be required.

ON THE ETIOLOGY OF VACCINIA.

BY CAPT. J. W. CORNWALL, M.A., M.D., I.M.S.

Attempts have been made in the past to raise stocks of lymph from many sources, from the cow-pox of the cow, from the horse-pox and grease of the horse, from the pox of sheep, goats, and swine, from variolated cows, and from other vesicular diseases affecting domesticated animals, such as herpes, rinderpest and foot and mouth disease. Crookshank in 1889 in his 'History and Pathology of Vaccination' denied in so many words that vaccination performed with lymph derived from any of these sources, with the exception of the variolated cow, has any protective influence whatsoever against small-pox. It is a little difficult at the present day to determine whether this statement be absolutely true or not: Crookshank brings forward no decisive evidence one way or the other, and there is always the possibility of the stocks that were, and in fact are, in use having been at some period altered in character by both intentional and accidental admixture of lymph derived from other, and truly variolous, sources. Nevertheless numberless persons, inoculated with strains of seemingly pure cow-pox lymph by many different operators, are recorded to have withstood the variolous test.

From the available descriptions it is clear that the appearances presented by idiopathic cow-pox and by inoculated small-pox on the udder of a cow are quite dissimilar and that after several passages the latter becomes indistinguishable from inoculated vaccinia. Similarly, a retro-inoculation of human vaccinia on the udder of a cow gives rise to appearances quite unlike idiopathic cow-pox. Cow-pox is a general disease of some severity in the milch cow. It is said never to have been observed either in bulls, dry cows, or calves, and this fact is used as an argument against the derivation of the disease from human variola, since, presumably, cows, calves, and bulls would be equally liable to be infected. However, if the disease were a modified small-pox. No instance is recorded of small-pox among cows, calves, and bulls. Moreover, it is on record of an outbreak of small-pox among men giving rise to an outbreak of cow-pox in cows. All bovines, however, are equally susceptible to artificially inoculated cow-pox. Cow-pox is not an infectious disease, it is spread solely by contact by the hands of milkers from cow to cow. Casual cow-pox in man sometimes runs a pretty severe course; and when children used to be intentionally inocu-

lated with the disease from a cow, they not unfrequently had generalised vaccinia. The severity of the symptoms in man was apparently proportionate to the severity of the disease of the cow from which the virus was taken. After a few removes the virus becomes milder in its action, and, when retro-inoculated into a cow, does not follow the same course as the natural disease. There is often considerable difficulty in transferring natural cow-pox to human beings, and infection only becomes certain after several passages from arm to arm. It is also difficult to transfer casual cow-pox in milkers from man to man. Horse-pox and grease are entirely distinct diseases; the former is a contagious disease characterised by the presence of vesicles on the face, genitals, and heels, of both stallions and mares. It can be communicated to other horses and to cows by inoculation, and in children its inoculation gives rise to vesicles indistinguishable from the typical vaccinia vesicle.

Both sheep and goats are subject to vesicular diseases known as the pox, and children, who have been inoculated with matter from them, are also said to have shown characteristic vaccinia vesicles. Inoculated cow-pox however, does not seem to protect sheep from sheep-pox. Children after inoculation with cow-pox, horse-pox and sheep-pox have been submitted to the variolous test, both by inoculation and by direct exposure to infection; and are said to have resisted the disease.

The vesicular disease, from which Macpherson in Bengal and Furnell in Assam attempted in 1832 to raise fresh stocks of lymph, was probably, according to Crookshank, rinderpest or cattle plague. Macpherson found that it produced good vesicles on native children, but that it had profound constitutional effects. He does not seem, however, to have had a death, and on subsequently variolating some of the children he had inoculated, small-pox did not follow, whence he not unnaturally concluded that he was dealing with genuine cow-pox intensified by climatic conditions. Furnell's own boy, however, unfortunately died with a pustular eruption followed the course of small-pox, as the result of an inoculation with matter taken from an Assam cow. Other accidents having resulted from the use of this stock, Furnell felt compelled to warn his professional brethren against the danger attending the use of vaccines obtained in this manner.

It is more than probable in the first half, if not three-quarters, of the 19th century that the apostles of vaccination were so eager to obtain fresh and potent virus that they collected lymph from every casual eruption that occurred on domesticated animals; and no doubt a good many of these vaccinations with foreign matter resulted not only in local disasters at the time and in the establishment of a sense of security in the persons operated upon, which later proved itself false, but also in a good deal of the opposition, which at different times has imperilled the very life of Jenner's doctrine. Attention was called by Jenner, and later by Ceely, to the existence of spurious pox among bovines, the lymph from which, though it might raise up apparently typical vesicles, had no protective property against small pox. Ceely describes three kinds of spurious pox in the cow, and Jenner himself at first failed to distinguish between grease and pox in the horse, and even looked upon the former as the source of all true cow-pox. It was soon found, however, that inoculated grease did not give rise to pox in the cow, whereas horse-pox was communicable. Moreover Jenner's idea that cow-pox only came to the cow through the horse was proved to be fallacious, since cow-pox was observed to arise spontaneously, or at least under circumstances in which transmission from the horse could be excluded. Sheep-pox appears to be a totally distinct disease. Sacco in Italy, and Marson in England are the only men, who found that ovination raised typical vesicles in children, who afterwards withstood the variolous test; but the results of both observers are open to suspicion, in the one case from tubes of sheep lymph and human lymph having been mixed up together, and in the other from the same lancets having, confessedly, been used for ovination that had previously been used for vaccination. Neither cow-pox nor variola can with any great degree of success be communicated to the sheep.

As regards goats and pigs the records are very vague. They are not from a kind of vaccine, but are relatively insusceptible to vaccination with variolous matter. I have tried myself to raise lymph on two or three goats but without success. In India, buffalo calves are used for vaccination purposes when ordinary calves are not available, and are said to produce active lymph. Donkeys too, I am told, have been successfully vaccinated in Madras by Col. King, but

are of no practical value as vaccinifers, as they are accounted unclean animals by Hindus.

It can never be proved whether vaccinia is modified variola or an entirely different disease until the infective agent of one of the two is isolated. One would be very reluctant to admit at the present day that inoculation with the virus of one disease would be likely to exert much protective influence against another disease caused by a distinct organism, knowing that a serum, which is fully protective against the variety of bacillus which produced it, is partially, at any rate, inoperative against other varieties of the same bacillus, and wholly so against other species; and so, if one accepts the view that a vaccine derived from cow-pox protects against small pox one is forced to believe in the identity of cow-pox and small pox., with the reservation that the infectious human disease is so modified by its passage through the cow that it loses its infectious properties while it retains its protective powers. But then the question arises how and when does infectious human variola become non-infectious cow-pox: that is to say, after how many removes from cow to cow. In spite of the great difficulty experienced in variolating a cow it has, apparently, been demonstrated, though not finally, that, on occasions, the virus obtained after variolation is actually still variola and not vaccinia, since it retains its infectious properties, and has caused definite generalised variola instead of vaccinia when inoculated into a child. This infectious property is not always manifested: out of a batch of children simultaneously inoculated; only a few of the most susceptible may show a variolous eruption, while others will only show vesicles at the points of insertion, which approach the vaccinia vesicle in appearance. The infectious property of variola may, however, entirely disappear after passage through a single cow. Nevertheless, whether the infectious property be retained or not, I do not see how we can avoid saying that a child, who has been vaccinated from a variolated cow,—no matter how many removes have occurred—has been just as much variolated as he would have been if he were inoculated directly from a case of variola. This assertion on the part of variola to dissociate from itself, or its power after passage through a cow is, however, based entirely on certain experiments performed at Lyons about 1880 by Chauveau and others, the results of which seem to have been misinterpreted by the authors.

Both in Berlin and in Boston other experimenters variolated cows, and stated that children subsequently vaccinated from them developed infectious variola and not vaccinia, but no descriptions are available. Ceely and Badcock in England, who, working independently, variolated a considerable number of cows, though with a success rate of only about 7%, and vaccinated thousands of children from them, never met with a single case in which variolous eruptions formed or infection of others occurred. On the whole, therefore, though our knowledge on this point is by no means complete, it may be taken that the chance of any variolous infection following vaccination from a variolated cow is very small indeed.

Whether horse-pox, sheep-pox, and goat-pox, are varieties both of cow-pox and variola need not now be considered. It is unlikely that it will ever again be necessary to resort to any of them for the purpose of raising a strain of lymph.

As I said before, it is hardly possible to tell now whether spontaneous cow-pox is really protective against variola or not. So little care used to be taken to use clean lancets, and to keep the vaccinated persons away from even actual contact with patients suffering from variola, that little faith can be rested on the assumed purity of the original strains of lymph used. So, altogether, it seems to me that we have not sufficient evidence yet to prove that cow-pox lymph, uncontaminated in any way by variolous matter, protects from variola, while on theoretical grounds there is every reason to believe that lymph from a variolated cow, deprived of some of its virulence by several passages, will protect. In practice too this variolous lymph has been found to confer ample protection, and to it is probably due, to a great extent, the present state of comparative immunity against small-pox in England. The duration of the immunity in the case of small-pox is as much a matter of personal idiosyncrasy as is natural immunity in the case of other microbic diseases, and, when Jenner claimed that his system of vaccination would confer as much immunity on the subject as would be gained by having previously passed through an attack of small-pox, he was probably no more aware than the public of the extraordinary susceptibility displayed by some persons towards infection. If he had definitely pointed out that whereas small-pox does not by any means invariably protect against future small-pox, it could

hardly be expected that any form of vaccination would be more potent in this respect than the unmitigated disease, he might have saved himself half the criticisms that were levelled against him, and the majority of the explanatory letters the best part of his life had to be wasted in composing.

It is a familiar sight in Madras in jails and coolie depôts, where vaccination is compulsory, to see young adults deeply pitted with previous small-pox and bearing at the same time on their arms six as typical vaccine vesicles as would ever develop on a new-born babe. Clifford Allbutt quotes the case of a woman who had small-pox three times and was successfully re-vaccinated once after each attack, making in all 7 distinct infections in one lifetime with a specific virus. The chemical composition of some persons is obviously of such a nature that no immunity, either autogenous or heterogenous, can exist. While, on the one hand, there does not seem to be any relation between the duration and amount of the protection established by an attack of small-pox and the copiousness of the eruption; on the other, the protection by vaccination is gauged by the number and area of the cicatrices, and this practice is amply borne out by statistics. The peculiarity lies in the fact that six vaccinal vesicles give rise to no greater amount of constitutional disturbance in the subject than a single successful one, though the amount of protection conferred by the six is greater than that of the one. I am not aware if anyone has claimed to have demonstrated the existence of a definite ratio of protection directly dependent on the number of vesicles, and it is hardly to be expected. We must content ourselves with the hypothesis that a large area cicatrised shows that the dose of virus has been large, that a severe attack of vaccinia has followed, resulting in complex chemical changes in the organism, which proceeded without concurrent recognisable constitutional signs, and that a correspondingly high degree of immunity has been established.

The pathogenic identity of vaccinia and variola of course cannot be doubted, when the vaccinia has been derived from an experimentally variolated cow, though no organism common to both has yet been demonstrated. I will not weary you with an account of the various researches in this direction, but will just mention the principal results so far obtained.

The protozoon theory has not of late received much support, though Funck not long ago described what he called the *Sporidium vaccinale* circulating in the blood of both calves and men after vaccination, attached to the red discs in much the same way as the malarial parasite. I have seen no confirmation of this observation, and I have myself failed to find the organism in the blood of calves after vaccination.

Klein discovered a minute bacillus in pure cultivation in vesicles not more than three days old, which disappeared, or perhaps spored, a few days later. It would not grow on any laboratory media. He considers it possible that preserved lymph contains the spores of this bacillus.

Monckton Copeman, working with the same or a similar bacillus, which would not grow on ordinary media, managed to cultivate it anaerobically inside a hen's egg. A calf, vaccinated with the growth, developed apparently typical vaccine vesicles, which were subsequently successfully transferred to a few children, but for some reason Copeman was not quite satisfied, and, though these experiments were made three or four years ago, he has published nothing further of importance.

In conclusion, I may re-state my thesis in these terms—Although there is no *a priori* objection to the view that idiopathic cow-pox in the cow is really acquired human variola, modified by the different composition of the cow, and that, being so, it will protect against human variola, there is no definite proof that this is the case. If, however, it be not the case, there are many *a priori* objections to the view that pure, uncontaminated, cow-pox lymph has had, or does have, any protective influence whatever.

The question cannot be finally settled until the bacteriology of variola and vaccinia and idiopathic cow-pox has been worked out, and under the favorable conditions which I hope will obtain at the new Vaccine Institute at Gairdner, there is no reason, if the officer in charge is not hampered by a number of superadded executive duties, why some of the problems in connection with vaccinia should not be solved. The economical aspect and financial importance of such researches need only be mentioned to be realised.

Two varieties of volvulus with untwisting and recovery with some surgical notes from mofussil practice.

By CAPTAIN C. L. WILLIAMS M.D., I.M.S., OOTACAMUND.

Laparotomy for volvulus with untwisting of the gut is an unsatisfactory operation: so much so that comparatively recently Colonel Maitland and Major Robertson wrote a paper on the formation of an artificial anus for this emergency. I am unable at the moment to put my finger on the reference, but think it is in our Transactions of about a year or so ago. There was nothing very unusual about the two cases I now record except that volvulus of the small intestine is not an everyday occurrence in mofussil practice and that, as so commonly happens, its interest was emphasised by contrast with a volvulus of the large gut occurring nearly at the same time in a comparatively small hospital. An old and feeble pariah woman, aged by guesswork at 50, was brought to hospital the end of last November with the usual signs and symptoms of intestinal obstruction. A diagnosis of probable volvulus was made. Her history was one of bending over a box four days before when the twist occurred. General condition on admission fairly good as regards pulse but there was some chronic bronchitis present, and whatever her years she was an old woman. Laparotomy was done and the usual distended sigmoid found and untwisted. She was an excellent patient and recovered perfectly in spite of a little peritonitis after operation.

The other case was in February last and was a male cooly, aged about 30, who eat his evening meal about 9 p.m. one night and went to lie down to sleep, when sudden pain came on. He was brought to hospital and operated on the next evening, i.e., about 24 hours after the occurrence. In this case a probable diagnosis of twist was made, because in 1895, I had an almost exactly similar case in the General Hospital, Madras, in which laparotomy was done and the mesentery untwisted, but the result was the post-mortem table. In that case I remember very well the boggy feeling in the recto-vesical pouch to the finger examining per rectum. This same feeling was present here also. In the limited literature at my command up here I do not find much about twists of the mesentery at all nor any mention of this aid to diagnosis per rectum. The man's condition was fairly good and lapa-

rotomy was done. The mesentery had turned on itself through 180° and a constricting band ran from above and on the left down and to the right across the spinal column, the band being a fold of mesentery. It untwisted fairly easily and the man recovered well.

Looking up my books for the last three years, which have been spent in the mofussil, many other cases of interest, hitherto unrecorded, come to mind.

Epithelioma of the external ear, occurred in male Mahomedan, aged about 35, at Masulipatam in 1898. According to the aurists this is far from a common condition. One verified the clinical diagnosis by microscopic sections before removing the auricle down to the membrana tympani. The man had much pain for a time after, but got well and left the hospital some time after. I also left soon after and have never heard of him again, so am unable to give his ultimate history. He, however, was glad it had been done.

Suprapubic prostatectomy.—I removed the prostate by suprapubic incision with enucleation in an old Hindu, perhaps 65, at Coimbatore, in October 1899. He recovered perfectly, and for the short time I saw him afterwards was enjoying his life and was quite a different man. An old man, from whom I removed the prostate in the same manner in the General Hospital, Madras, some years ago also recovered and was relieved of all his sufferings. One old man in Madras was relieved by Harrison's operation of complete vasectomy, but I am still waiting for more material on which to write a paper on enlarged prostates in India. Operations for this condition are not very common out here, I fancy. My last case was a Toda here with a very large and hard prostate and very marked pyuria, the urine being acid. He had, I suspect, pyelitis from backward pressure. At the mention of operation, however, his friends promptly removed him in spite of the fact that he had to kneel on the bed and bend down till he nearly stood on his head to pass his urine.

Myxoma simulans hydrocele of the neck.—This was a tumour the size of an English hen's egg in a European girl of 28 up here. It was very deep behind the clavicle and except for the depth from which it had to be extracted was only interesting from its pathological structure, being a pure myxoma with absolutely no trace of its original structure.

Melanotic tumour of eyeball.—This was a growth in a Hindu adult woman the size of half a walnut and projecting like a staphyloma. After removal it could be traced no deeper than the conjunctiva, from which apparently it sprang, just behind the sclero-corneal junction. And it is in this origin that its interest lies.

Trephining for supposed cerebral abscess.—This case was a young pariah woman, about 25, with giddiness, ataxia, a scar in the upper and posterior part of the membrana tympani, a voracious appetite, a painfully emaciated appearance, and tenderness sometimes above the ear: with persistent headache along a line from behind the ear, above it and to the outer angle of the orbit. The condition was of about four months duration. The history of fever, vomiting and syphilis was very unreliable, owing to the low intelligence of the patient and her people, but as Iodide of Potassium had no effect whatever on the condition I trephined over the temporo-sphenoidal lobe and explored the brain deeply in half a dozen places but without finding either pus or signs of a new growth. She recovered, however, and the headache has not returned.

Tubercular peritonitis.—Two adult native women were admitted to hospital, to the same ward, nearly at the same time. On one I performed laparotomy and she improved very much at first and left the hospital better but, I heard, died soon after discharge. The diagnosis of this was of course certain, as one saw the studded peritoneum. The other case I did not operate on but treated with Creasote and Iodoform. She recovered perfectly. One can, of course not speak to the diagnosis as a fact in this case, as the peritoneum was not exposed, but there is no reasonable doubt of it from the clinical signs. The two cases presented a very interesting contrast as one visited them day by day: and Creasote and

~~the patient~~ certainly took the honours.

CASE OF INTESTINAL OBSTRUCTION.

By MAJOR D. SIMPSON, M.D., I.M.S., COONNOOR.

The following account of a case of intestinal obstruction in a Hindu girl of 13 is of some surgical interest. She was brought to the Coimbatore Hospital on the 13th August and it was evident the moment she arrived that she was suffering from obstruction which had lasted some time. No motion had been passed for five days, the abdomen was tense, distended and tympanitic. It was reported that she had had attacks of vomiting at intervals during the whole of this period and, in any case, at the time of admission this symptom was present and the vomited matter had a foul odour of decomposing matter. The abdomen was too distended to make out or locate the cause or site of the obstruction. An enema of warm water with Ol. Ricini which was administered was at once returned without containing any faecal matter. I ordered the patient to be prepared and all the necessary arrangements made for laparotomy. In recalling my experience in such cases that the usual sequence of events has been that a patient is brought in a weak exhausted condition with the usual signs of intestinal obstruction having existed for some time, the abdomen has been opened and a groping search made for the site and cause with little relief, even when found and apparently rectified. There has been the usual morning report that the patient sank in the night and died of exhaustion. On this occasion I resolved to be guided, as far as possible, by the dictum laid down by Treves in the treatment of such cases that "it is essential to recognise that the surgeon's object should be rather to relieve the obstructed bowel than to remove the cause of the obstruction."

the incision to an embarrassing extent. The bowel was streaked with films of lymph deposit from inflammatory exudation due, evidently, to a peritonitis, its colour being of a deep rose-pink from acute inflammation. By means of a trocar and cannula I perforated the bowel to permit the escape of gas, but such was its state of atony, from its ballooned condition, that, even after the escape of gas and a small amount of fluid matter, there was no perceptible diminution in its size, even after placing and pressing it between the palms of my hands, though it was much less tense. With a larger cannula more might have been effected, and in similar cases I would use the largest one available. I found the small intestine at one point quite flaccid, which therefore eliminated the large intestine from being implicated, and inasmuch as I was unable to trace it by two fingers, I enlarged the wound, and searching with the hand inside the abdominal cavity, I followed the bowel down to a point where I found one coil glued to an adjacent coil by inflammatory deposit on its surface and so contracted, in an hour-glass manner, at their points of adhesion, as to render the lumen of the tube quite closed to the passage of its contents. Above this point there was visible distension and obstruction, while below it the bowel was empty and flaccid and much less inflamed. On bringing this part outside the abdominal cavity, I carefully separated the two coils and peeled off the constricting lymph bands. This produced no immediate visible effect in diminishing the calibre of the bowel though tension was diminished. With the bowel between two fingers I pressed the semi-solid contents along past the now relieved site of constriction, but this did not affect the condition of atony into which the intestine had passed. I removed the cannula and stitched up the opening with catgut suture and then proceeded to return the bowel inside the abdominal cavity, which was a matter of some difficulty from its constitution. I had not been able to relieve and diminish it to an extent which has been achieved by the use of a cannula in the way described, it would have been necessary to have opened the bowel and to have relieved the urgent condition by the use of a cannula.

hour by mouth containing a drachm of whisky, and on the subsequent days one ounce of peptonized milk every 2 hours, the alcohol being continued and increased for some time. Liq. Morphine in xv minim doses was also given as required. The temperature remained subnormal until the end of the 3rd day when it arose to 99.2, but for the first day after the operation it was under 97°. There was nothing passed by the bowels until the end of the 3rd day when two motions were passed, a glycerine enema having been given some hours previously. A scanty motion was passed daily after this until the 6th day when she had eight motions followed by three in the night. This showed that the peristalsis of the bowel was now asserting itself markedly and may be taken as an index of the probable time the bowel takes to recover itself after being rendered powerless by prolonged distension as the subsidence of the distension was simultaneous with the free action of the bowels. From this onwards, the action was less free, becoming gradually reduced to two motions in the day. In a fortnight the case was feeling convalescent and was only delayed by the slow union of the abdominal wound which was retarded by some suppuration between the edges.

