and irregular; respirations 25, temperature 102° ; serum, 10 c.cm., injected 10 P.M.

April 6th. Next day, twelve hours later, the temperature fell to 101.4° , but afterwards rose to 102.8° ; still very delirious, general condition rather worse; at 2 P.M. serum injected.

April 7th. The temperature gradually fell to 100.8° at 10 A.M., very delirious; pulse 140, feeble, slightly irregular; respirations 38, shallow, slight tremor present; temperature, 6 P.M., 103° ; serum, 10 c.cm., injected.

April 8th. Less delirium, feels better, highest temperature 102° ; subsequent progress was slow, but the temperature did not rise again above 102° , reaching 99° three days later; convalescence was delayed by furuncles, but no abscesses formed.

CASE IV.—J. P., a previously healthy man of 21, admitted with initial temperature of 101° . A very severe confluent attack, accompanied by much active delirium and some bronchitis.

April 21st. Pulse 118, weak; respirations 28, irregular, tremulous at times, tries to get out of bed. Patient very weak. Temperature 101.8° ; serum, 10 c.cm., injected at 6 P.M.

April 22nd. Temperature rose to 103° at 6 A.M., but gradually declined to 101° ; general condition rather better.

April 23rd. Very delirious, had to be tied in bed. In very exhausted condition; pustules drying up. At 10 A.M. the temperature rose to 104° ; serum, 10 c.cm., injected. Temperature, 10 P.M., 102° .

April 24th. Very weak; pulse 130, irregular; respirations 34, shallow. In the afternoon the temperature rose to 104° ; sponged, fell to 101° , later rose to 103° ; serum, 10 c.cm., injected at 6.30 P.M.

April 25th. The temperature has steadily fallen to 100.2° ; seems better, much less delirium; pulse 110, regular; respirations 25, very weak; temperature at 2 P.M., 103° ; sponged; temperature 101° ; subsequently temperature only exceeded 100° on one occasion. The prostrated condition lasted for several days, but convalescence was later very rapid, though accompanied by almost complete alopecia.

CASE V.—A woman, aged 44. Admitted on third day of disease (temperature 105°) with severe confluent attack. For five days after admission she was very restless. At times delirious; pulse 110 to 120, temperature fluctuating below 101° . On the fifth day the temperature reached normal; on the sixth day secondary fever began. During this period she was very restless and at times maniacal; the vesicles remained of small size, and early ran together in large irregular confluent areas. At this period the condition was very grave; pustulation was in progress, there was much vomiting and delirium; the pulse was 120, weak; respiration 25, cardiac sounds feeble; the temperature steadily rose, till at 10 P.M. on the ninth day it reached 103.2° . Serum, 10 c.cm., was then injected. Four hours later the temperature reached 104° , after which it steadily fell to 100° at 2 P.M. on the tenth day. At 10 P.M. the temperature again reached 103° . Serum, 10 c.cm., was injected during this period. The woman's condition was very critical; she was getting weaker, and evidently was losing ground. Eight hours after the serum the temperature fell to 101.4° , but later rose to 104.2° , when more serum was injected, followed by a fall of temperature to 103° ; death, however, occurred twelve hours later on the twelfth day.

CASE VI.—W. H., labourer, admitted on the fifth day, with very copious eruption on face, neck, hands, and arms, less copious on trunk; secondary pyrexia began on the eighth day, and pustulation occurred about the same time. The general condition and progress closely resembled that described in other cases. On the twelfth day the temperature reached 104° , when serum, 10 c.cm., was injected. In twelve hours the temperature fell to 101.8° . The pulse was 125, very weak and irregular. Respirations 25 twenty-four hours later. On the thirteenth day the temperature again reached 103.8° . More serum was then injected, with the result that the temperature fell in sixteen hours to 101° on the fourteenth day. From this date till the eighteenth day the temperature only once reached 102° ; the patient seemed stronger and took food well, though pustules cleared up slowly. On the eighteenth day the condition became worse, very restless; irregular pulse, 130, and some tremor; temperature 103° ; more serum injected, resulting in a fall of temperature to 100.2° in twelve hours. Temperature again began to rise, and patient, who showed signs of cardiac failure, died four days later, the temperature for eight hours before death being 107° . The long interval preceding the third injection was due to accidental causes.

In earlier cases serum injections were repeated only as the temperature rose after a previous injection, and the interval between the injections therefore varied. Later, however, better results were obtained after injections at regular intervals of twenty-four hours, beginning, as a rule, with the onset of pustulation. In no case were more than three injections given. Probably in some cases the injections should be continued for longer periods, or the amount of the earlier injections increased.

In cases treated with serum, the critical period following the absorption of the pustules was shortened, the intensity of the toxæmia seemed to be less, there was much less tendency to cardiac failure or collapse. The pulse throughout, though fast, was regular, and the strength of the beat was well maintained. Convalescence set in earlier and progressed rapidly. These patients were out of danger, and out of bed, before others with attacks of similar intensity. Most important of all, not one of the four patients treated with serum who recovered developed a single abscess throughout the convalescence. In cases of similar severity it was often necessary to make from 30 to 60 incisions in the same patient for abscesses or cellulitis, and many patients died in this condition of semi-pyæmia. That the severity of attack in these reported cases was as great as in those often fatal, where complications above referred to arose, is shown by the fact that

they, too, suffered from acute furunculosis, almost complete alopecia, and flesh was lost as rapidly as in other cases. No local pain, local abscess, arthritis, or hyperpyrexia ensued in any of these cases.

BACTERIOLOGY.

To establish bacteriologically the value, whether great or little, of this treatment, would require a prolonged and careful bacteriological examination of the vesicles, pustules, and resulting abscesses in all their stages, such as the writer was unable to carry out. More or less roughly, by cultivations on ordinary media, organisms were obtained from pustules and from the pus of abscesses giving reactions similar to streptococci, and in a few cases to staphylococci. The contents of a vesicle, which appeared to have undergone purulent change in its interior, rather than on the surface, was examined by the Clinical Research Association, they reported staphylococcus aureus and staphylococcus albus present.

The bacteriology of variola is very incompletely known. Cohn¹ found cocci in variolous lymph, and this observation was confirmed later by Burdon Sanderson. Weigert² found the lymphatics in the region of a pustule, both in human small-pox and in sheep-pox, filled with cocci which were later named streptococcus variolæ et vaccinæ. Hlava³ established the presence of streptococcus pyogenes in small-pox pustules. Garre⁴ found streptococci in the internal organs in a case of variola hæmorrhagica, and in a fatal case complicated by pemphigus he found the streptococcus pyogenes aureus in the pemphigus vesicles. Steinberg⁵ says that the microbes found in variolous pus are the usual pyogenic organisms.

Finally, the object of this paper is to set forth clinical facts that occurred under the writer's observation; not to propose a theory, but to leave others, whose opportunities for treating variola patients and for making the necessarily extended bacteriological inquiry are more prolonged than was the writer's, to test by a fair trial the value of this treatment.

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THE TREATMENT OF INGUINAL HERNIA IN CHILDREN.*

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INGUINAL hernia in children is a curable affection. Nature herself tends to bring about a cure, and it should be the aim of the surgeon to aid her in this. Yet it is a fact that there are very divergent opinions as to the best method in which art may thus assist the natural disappearance of the condition.

It is only my intention to discuss the treatment of the protrusion; yet to understand this thoroughly a few points in the etiology and the anatomy of the affection may not be out of place.

ANATOMICAL CONSIDERATIONS.

In both sexes a finger-like process of parietal peritoneum passes down through the inguinal canal, in the male accompanying the testis, and in the female the round ligament of the uterus. It is usual for this prolongation of the serous membrane to become obliterated and converted into a fibrous cord, wholly in the female, and except the lowest part in the male, this latter portion remaining as the tunica vaginalis. This closure should be complete very soon after, if not before, birth. Any failure in the obliteration of the process predisposes to protrusion of some of the abdominal viscera into the ready-formed sac. But I firmly believe that a very considerable proportion of infants who have a patent processus vaginalis never become the subjects of inguinal herniæ, and therefore it is necessary to look further for an exciting cause other than this predisposing condition.

* Read before the West Surrey District of the South-Eastern Branch of the British Medical Association.

Such a determining influence is generally said to be found in some factor which may of itself tend to produce violent expulsive efforts on the part of the child—as, for instance, a cough, constipation, phimosis, etc.; but I must confess that, while allowing that these have, perhaps, a certain amount of action in the production of the descent of the viscera, yet I do not think that the general and probably the most potent cause is to be found in any one of them. Improper diet in the early months of life is almost universally the factor that is at work. The faulty food sets up gastro-enteritis, leads to diarrhoea, vomiting, and to the development of a large quantity of gas in the intestines, and so to over-distension of the bowel. This in its turn produces greatly increased intra-abdominal tension, and thus the gut is brought into almost forcible contact with the weak spots on the abdominal wall, and hernia results. Certainly umbilical herniæ owe their origin to this factor, and I think also the majority of inguinal protrusions do the same. At the same time, the crying of the child, caused by the colic from which it suffers, will enhance the likelihood of a hernia appearing.

TREATMENT.

Passing now to the actual treatment of inguinal herniæ in children, I purpose to discuss it under two headings—mechanical and operative. The majority of inguinal herniæ—and for that matter all herniæ—in children are reducible, probably from the fact that the omentum is but seldom in the sac, as it is at this early age imperfectly developed. Sometimes there is some amount of difficulty in returning the contents of the sac, generally owing to the overdistended condition of the abdomen.

The rational palliative, or rather non-operative, treatment of the protrusion consists in the removal of any exciting cause, reduction of the contents, and the application of some form of apparatus to maintain the viscera in the abdominal cavity. The natural processes will then usually lead to the closure of the patent tube of peritoneum, and thus to the cure of the protrusion. It is only so long as the process of the serous membrane is dilated by the descent of viscera that its opposing surfaces are kept asunder. Remove this dilating force and obliteration will follow.

First, then, as to the possible exciting cause. Diet should have the utmost attention paid to it, but it is beyond the scope of this paper to more than indicate this important fact in connection with the successful treatment of these congenital protrusions. Careful regulation of the bowels is very necessary. With regard to phimosis, although admitting that in extreme cases where ballooning of the prepuce is occasioned by every act of micturition, I do not think a tight foreskin has much to do with the production of a hernia for the following reasons:

1. A large number of boys are afflicted with phimosis who never become the subjects of herniæ.
2. Congenital inguinal protrusions are decidedly frequent in Jewish male infants.
3. The phimosis in the majority of cases does not produce much, if any, obstruction to the outflow of urine, and therefore little or no straining on the part of the child.

If then phimosis exercises only a very moderate amount of influence in the production of a hernial protrusion, the question naturally arises as to whether circumcision can be beneficial so far as the hernia is concerned. I think that in some few instances the removal of the prepuce may tend to diminish the probability of increase of the protrusion, but I am quite sure that the operation will not cure or even materially benefit a hernia which is already in evidence.

It is unfortunately not infrequent to find that the operation of circumcision is performed and the child is not afterwards fitted with a truss, because it is thought that the removal of the foreskin is all that is needed to cure the hernia, while the fact is that in such cases the protrusion steadily enlarges.

To put it briefly, therefore, phimosis is seldom, if ever, an exciting cause of hernia in children, and consequently circumcision alone is not very likely to bring about a cure. This statement does not, of course, imply that the operation should not be performed for other adequate reasons, but that it must not be considered as of primary importance in its relation to congenital protrusions.

Secondly, we come to the reduction of the contents of the sac, and the application of some form of apparatus that is to keep the viscera within the abdominal cavity. As has been said, reduction is usually easy, but it is often not a simple matter to keep the contents of the sac reduced.

The form of instrument to be applied again occasions some divergence of opinion. It may be said that there are two chief varieties of apparatus in use—the skein of wool, and the steel spring truss. I may at once say that I strongly disapprove of the former, and earnestly recommend the latter.

THE WOOL TRUSS.

When one has to deal with a large number of congenital inguinal herniæ, the uselessness of the skein of wool truss becomes only too apparent. I believe that this form of appliance was first introduced by Mr. William Coates in the year 1848, and it still holds its own in the practice of many.

Let me give shortly the arguments for and against its use:

For: (1) Its simplicity; (2) its cheapness; (3) the ease with which it can be changed; (4) that it can be worn in the bath, and a dry one applied immediately afterwards; (5) that no attention is required except at the moment of changing.

Against: (1) It is inefficient, and therefore a false security, except in the simplest of cases; (2) it exercises little if any pressure directly over the hernial apertures, and thus no likelihood of a permanent cure is gained; (3) it may cause excoriation.

THE SPRING TRUSS.

Let me also give shortly the arguments for the spring truss:

For: (1) It is very efficient in retaining the viscera within the abdomen; (2) it exercises pressure directly over the inguinal canal, and thus tends to bring about obliteration of the processus vaginalis, and to enhance the prospect of a lasting cure.

In discussing the application of a steel spring truss to an infant, it may at once be conceded that an ill-fashioned instrument, covered with impure red composition rubber, one which is either too small or too large, or one that is improperly adjusted, will inevitably cause trouble. On the other hand a well-made truss, covered with pure rubber, with no seam that is next to the skin, of the right size, and properly adjusted, but seldom causes much inconvenience.

The method of measurement for an inguinal truss for an infant or young child is the same as that for an adult, that is to say, the tape should be carried round the pelvis obliquely, at the base of the sacrum behind, half way between the crest of the ilium and the top of the great trochanter at the side, and above the symphysis pubis in front.

For a single truss the actual number of inches thus obtained is the correct size; for a double truss it is well often to add an inch to this measurement, because a double truss does not stretch at all. The adjustment of a truss at so tender an age is of the utmost importance. The inguinal canal in infancy is practically non-existent, since the deep abdominal ring lies almost directly behind the superficial, but both, it must be remembered, are placed above the level of the pubic bone, and therefore of the symphysis. In children the upper part of the symphysis pubis is considerably higher than it is generally supposed, or than it appears, to be. There is, however, a distinct guide to the level required, for every child, and particularly a well-nourished one, presents a curved line running across the lower part of the abdomen, known as the fold of Venus, which accurately indicates the upper limit of the pubic bones.

The important fact to be borne in mind is that the whole of the pad of the truss must lie above this line, for if it be placed below it, the soft parts upon which it will then impinge must of necessity be compressed between the pad and the unyielding bone beneath, and, moreover, the pad would in no way tend to retain the intestine, seeing that it is placed altogether below the site of the rings through which the protrusion passes. Very soon such pressure would cause irritation, and then excoriation, but this untoward result can be entirely avoided if the truss is worn at the proper level, where it will press only on the soft parts. Here, moreover, it has but little tendency to shift its position, or to be displaced by the intentional acts of the patient.

A truss thus carefully adjusted must be worn by the child

continually, day and night, sleeping and waking, crying and peaceful. Temporary removal is necessary for the purposes of cleanliness, and when this is needed it should be undertaken with the patient recumbent, and when left unguarded by the truss, the hernial aperture should be protected by the nurse's finger or thumb.

It is remarkable how rapidly, often within a few weeks, after the application of a truss of a proper form for a congenital inguinal hernia, descent of the viscera ceases, but such would soon recur if the truss for any reason were discontinued. Permanent closure of the processus vaginalis will be obtained in the majority of cases only after a continuous action of the pressure of a spring truss over a period of some years. A cure, therefore, can be safely predicted, but the truss should not be discarded until the child has reached the age of at least three years.

Treatment by trusses should be begun at the very earliest possible moment, as for each year of life which is passed without the use of the instrument there is a corresponding diminution in the probability of a permanent cure. It is highly fallacious to aver that a hernia in an infant will become spontaneously cured without active treatment by truss pressure. Such a result is so extremely rare that it must be disregarded in practice.

Congenital inguinal herniæ in female infants are even more likely to be cured by treatment than those in male subjects. In certain instances young boys may develop very large scrotal herniæ, the outcome of neglect, which may not be efficiently controlled by an ordinary truss. In such cases a rat-tail or a forked-tongue truss will be required. In all cases of hernia in the young, attention should be paid to the encouragement of muscular development by means of calisthenics, etc.

THE RADICAL OPERATION.

Passing now to the operative treatment of inguinal herniæ in childhood, I would preface my remarks by saying that it is only a small minority of cases that need operation.

There are two chief arguments against a radical operation with a view to a cure in the case of young children, say before 3 years of age. One is the strong probability there is that a spontaneous cure will result, provided efficient truss pressure is secured, and a proper diet is given to the patient. That such a happy termination does frequently ensue is, I think, the experience of most practitioners, and it is certainly not common to be given the history of a hernia having been present in infancy, then an apparent cure, and afterwards a relapse in later life. This fact would seem, therefore, to be a valid argument against the necessity of an operation.

The other argument that is put forward is that the wound formed so near the urinary apparatus in a child is very liable to become septic. I do not think that this has much weight, for it is comparatively easy to prevent infection if the wound is made, as it should be, in the inguinal region and immediately closed with a collodion dressing of small size. It is a great mistake in all operations about this region in children to apply a bulky dressing, for such is much more liable to become contaminated than is a small one.

The following are the cases in which an operation may be advised:

1. Where a child is being properly fed, but in whom a hernia after a fair trial is not retained by a suitable truss, so that there is little or no chance of a spontaneous cure.
2. Where part of the contents of the sac are irreducible.
3. Where a truss has been worn for at least three years, but with no apparent cure of the protrusion.
4. Where a child has reached the age of at least 3 years but has never worn a truss.
5. Where a herniotomy has to be performed for strangulation.

Now, it is unusual for a hernia in a child not to be adequately controlled by a proper truss. It is rare to have irreducible contents in early life. A truss generally brings about a cure. The subject of a hernia in infancy is not often in the present day allowed to go for three years without treatment, and strangulation seldom needs an operation in children, so that it will be seen that the cases where a radical operation is needed are not by any means common.

The preparation of a child for a radical operation upon its

hernia is a matter of considerable importance, for asepsis is a primary necessity to safety and success.

I always prefer to have the patient in bed for two days prior to the operation, so that the child may become somewhat accustomed to the necessary restraint, and in order that the skin may be thoroughly prepared. Two days, therefore, before the morning of the operation, the surface of the skin in the area of the wound that is to be made, should be scrubbed with soap and hot water, then the parts treated with ether, and finally with an antiseptic solution consisting of 1 in 2,000 biniodide of mercury. It is not well to use too strong an antiseptic upon the tender skin of a child, otherwise there is a great tendency to the formation of an eczematous eruption.

Directly after the application of the antiseptic, a dressing of the double cyanide of mercury and zinc gauze is to be firmly and immovably adjusted. This is left on until the following morning, when it is removed, and the whole of the process of cleansing repeated.

The second dressing is untouched till the time of the operation itself. On the table the cleansing is again carried out in a similar manner, so that the parts are only exposed immediately before the incision is made. I believe that this method of preparation is one that causes the least irritation, and one that at the same time induces true asepsis, for any septic material that lies at the bottom of the glands of the skin has time to be brought to the surface by the actively secreting glands. It is absolutely necessary that every step of the operation should be conducted with strict attention to the question of asepsis.

With regard to the actual operation, as the case is one of a congenital inguinal hernia, and presents merely a congenital aperture in the parietal peritoneum, there is nothing that is needed save to close this opening, seeing that the musculature of the abdominal wall is not at fault. This closure, however, must be performed at the site of the deep abdominal ring, and but little account need be taken of the superficial aperture.

The older the patient the more external lies the deep ring or the entrance of the canal, and thus the more it is under the cover of the arching fibres of the internal oblique and transversalis muscles. It is this fact, again, that renders the prospects of a lasting cure after operation so genuine.

An incision, which need not in a child be more than $1\frac{1}{2}$ inch long in the majority of instances, is made over the line of the inguinal canal, extending from a little external to the middle of Poupart's ligament to just below the level of the crest of the os pubis. By this incision, the whole length of the canal will be uncovered. The aponeurosis of the external oblique muscle is thus exposed, and is to be divided the entire length of the wound, but at a somewhat higher level than the skin incision.

The neck of the sac is now separated from the spermatic cord, or the round ligament of the uterus that lies behind it. This dissection in the male subject may be a matter of some difficulty, and needs care to avoid injury to the vas.

When the neck of the sac has been isolated right up to the parietal peritoneum, which can be done by retracting the fibres of the internal oblique and transversalis muscles upwards and outwards, it should be opened, and any contents completely reduced into the abdominal cavity. I then usually deliberately sew up the aperture in the parietal peritoneum by a continuous suture of fine silk, in the same manner as in an ordinary laparotomy wound. In this way obliteration of the mouth of the sac is secured, and that quite at its connection with the serous membrane lining the wall of the abdomen. It is not necessary to close the lower end of the funicular portion of the processus vaginalis, for a natural tunica vaginalis will be formed in the male.

In the majority of instances this is all that is required, for I do not think that it is advisable in a congenital hernia to suture the arching fibres of the internal oblique and transversalis muscles to the lower half of Poupart's ligament in front of the cord.

These fibres normally act as a kind of sphincter and even in a sense as a valve, and the less they are disturbed either by division or suturing the better. In some cases where the hernia has been much neglected, and the parts have become a great deal stretched, it may be essential to insert one or even two sutures of silk so as to approximate the roof of the canal to its floor.

The aponeurosis of the external oblique muscle is now brought together by a continuous suture of fine silk, and the skin wound by interrupted sutures of silkworm gut. Then a small collodion antiseptic dressing is applied and the parts left untouched for five or six days, when the dressing is removed and the superficial stitches cut out and the wound redressed.

The child need not be kept in bed longer than ten days, after which period it may be allowed to run about, provided that sound healing has taken place. There is no necessity for such a patient to wear a truss subsequent to the operation, unless the parts previously had been much dilated by a large hernia. In this instance it is well that a truss should be applied for about a year as a precaution. The results of these operations are most satisfactory, and it is doubtful whether a promise can really be made of a lasting cure, save in the congenital inguinal herniæ of children.

IRREDUCIBLE HERNIA.

So far I have only dealt with reducible herniæ. A hernia which is in a condition of simple irreducibility, that is, one which is irreducible, but not strangulated, is not common in young children, but it does occur occasionally as the outcome of a congenital cæcal hernia on the right side, and more rarely owing to adherent omentum.

Both of these irreducible herniæ are perhaps best treated by operation, although if this for any reason is contra-indicated, then the application of a hinged-cup truss is to be advised.

When strangulation occurs in the congenital inguinal herniæ of childhood, it is seldom very acute—that is to say, the signs of intestinal obstruction are not well marked. Moreover, reduction is usually comparatively easy by taxis, or the hernia may become reduced either spontaneously or after the lower limbs and pelvis of the patient have been kept elevated for a few hours.

If these means fail, then herniotomy is necessary and should be performed together with a radical treatment of the sac.

TWO CASES OF RESECTION OF THE LARGE INTESTINE, WITH RECOVERY.

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THESE two cases are examples of the commonest causes for which the large intestine may require resection—namely, for strangulation and gangrene by hernia, and for carcinoma. They both illustrate the wisdom of postponing resection when obstruction exists until this has been relieved. Case I is published especially to draw attention to the merits of extraperitoneal resection and suture for artificial anus.

CASE I. Strangulated Left Inguinal Hernia: Herniotomy: Perforation of Transverse Colon: Resection of Bowel Five Weeks Later: Recovery.—T. T., aged 46, was admitted to the London Hospital on November 23rd, 1896, with a large, strangulated, left scrotal hernia. The hernia had existed for twenty years, and he had worn a truss. On November 20th the rupture came down and he was unable to reduce it. Vomiting commenced on the 22nd instant. The bowels had not acted since the 10th. On November 23rd herniotomy was performed. The sac contained omentum and a portion of the transverse colon. This was deeply congested and perforated, the opening was too large and the condition of the bowel too unsatisfactory to admit of closing the opening by sutures. A glass tube (Paul's) was tied in the large intestine, and this was fixed by one or two sutures to the skin in the inguinal region. The patient recovered from this operation without any troublesome complications. A portion of bowel covered with granulations protruded from an opening in the abdominal wall, and the whole of the faeces were discharged through it. After allowing an interval of five weeks to elapse in order that the parts might consolidate and the inflammatory thickening disappear, the operation of resection was performed on January 2nd, 1897. Anæsthetic, ether and A.C.E. mixture. An incision was made vertically upwards in the semilunar line from the small protrusion of the bowel. This divided all the structures down to the peritoneum. It was my intention to perform the resection entirely extraperitoneally, after the manner suggested by the late Mr. Greig Smith.¹ But the peritoneum was found so thin and delicate that it would not permit of the necessary manipulation. This was doubtless due to stretching of the membrane from the proximity of the hernia. The peritoneal cavity was therefore opened, the proximal end of bowel secured, and the protruded portion then separated by the division of the abdominal parietes around it. The knuckle of intestine to be excised was brought quite out of the abdominal wound and the peritoneal cavity protected with sponges. The gut was resected, and the divided mesentery brought together with a running suture. The mucous membrane of the free ends of the intestine was first united by a continuous suture of fine silk. Next the peritoneal

and muscular coats were united by about fifty Lembert sutures. The running suture through the mesentery was tied last. Finally, a graft of omentum was fixed around the line of sutures, especially near the mesenteric attachment. The abdominal wound was closed and a small drain was left in it. This was removed in twenty-four hours. The operation lasted about two hours. The patient suffered considerably from shock after the operation, but was never sick, and the wound healed by first intention. He was fed by nutrient enemata until the fourth day, when champagne and milk were given by the mouth. On January 28th he was able to leave his bed, and soon afterwards he was discharged quite well.

CASE II. Carcinoma of Descending Colon: Colectomy: Recovery.—B. D., aged 47, was admitted to the London Hospital under the care of my colleague, Dr. F. J. Smith, on January 28th, 1898, suffering with chronic constipation.

History.—Her illness commenced at the beginning of the summer of 1897 with pain in the abdomen and vomiting. The vomiting occurred about two hours after a meal, and the pain was relieved by it. Some months ago she noticed a lump in the left loin. She had passed blood with the stools occasionally for some years, and had resorted to enemata for constipation for two years. Lately tenesmus had existed. She had lost two stone in weight within the last six months. She was transferred to the surgical wards on February 6th. Occupying the left loin just below the level of the kidney was a sausage-shaped tumour distinctly movable from side to side, and evidently situated in the descending colon. No enlargement of the liver existed. The abdomen was somewhat distended. Carcinoma of the descending colon was diagnosed. As a preparation for resection of the bowel a mild purgative (magnesiæ sulph.) was given, with the result that the constipation became absolute, the abdomen distended, and she vomited.

Operation.—February 10th, 1898. Anæsthetic, ether. The tumour was exposed by a longitudinal incision in the left flank, and found to be a constricting carcinoma of the descending colon just below the splenic flexure. The tumour was brought out through the wound, together with some inches of bowel on each side of it, and was stitched to the parietes, the wound being partially closed. An incision was then made into the bowel on the proximal side of the tumour, and a glass tube (Paul's) was tied in. It was not thought advisable to perform resection and suture of the intestine immediately, owing to the fact that the intestines were considerably distended, and the patient's condition not favourable for so serious an operation.

February 21st. The portion of the bowel with the tumour protruding from the wound was cut away level with the skin. The incision was so planned that more of the concavity than of the convexity of the protruding knuckle was removed, in order to permit subsequently of easier approximation of the ends. An attempt was made to prevent formation of a spur by suturing together the mesenteric borders of the ends. Microscopic examination of the tumour showed it to be a typical columnar-celled carcinoma. An interval of about a month was allowed for the inflammatory effusions around the wound to become absorbed.

On March 25th, under ether, an incision through the skin and parietes was made around the colotomy wound, and this was continued above and below the artificial anus for a considerable distance. These incisions were carried down to the peritoneum, which was then separated from the parietes for a distance of 1½ inch to 2 inches all round the bowel. The collar of skin attached to the divided ends of the bowel was removed, and the latter were refreshed, except at the united mesenteric borders. The ends of the bowel were then brought together by two rows of sutures, one uniting the mucous membrane, and the other the peritoneum and muscular coat. The bowel with the peritoneum was then pushed inwards, and the parietes united with silkworm gut, the wound being completely closed with the exception of a small gauze drain. Food by the mouth was given on the fourth day.

On April 3rd, nine days after the operation, a small fistula formed, and a slight faecal discharge appeared on the dressings. Subsequently the wound was washed out with 1 in 4,000 solution perchloride of mercury whenever the dressings were changed, but there was no further discharge of faeces. The sinus was quite closed on April 20th. The patient was then allowed to get up. She is now (May, 1899) perfectly well, with no symptom of recurrence.

The propriety of draining the perforated intestine at the first operation in Case I, instead of attempting an immediate resection, is scarcely open to doubt. This remark applies to the present day, when Murphy's button is so much used, nearly as forcibly as it did in 1896, when the case related occurred; and it would apply more strongly to the large intestine than to the small. The introduction of Murphy's button has not in my opinion affected the justice of the conclusion expressed by Mr. Greig Smith as follows: "I have come to the conclusion that to resect living intestine during obstruction is surgically unsound; and I doubt if any improvement in methods will ever make the operation justifiable. The shock and the illness which follow resection of bowel are too great to put on a patient suffering from intestinal obstruction." It has occurred to me that a perforation or other limited lesion of intestine, not suitable for suture, might be treated by an invagination of a portion of the circumference of the bowel, the invaginated part being retained in position by sutures; but I have not had a favourable opportunity of putting this to the test. Before performing resection I considered whether I would suture or use a Murphy's button, and came to the conclusion that for the large intestine, at any rate, the former was the safer.

In regard to Case II the same remarks concerning immediate resection at the first operation apply, although the obstruction