a prolongation outwards to be inserted into the ileo-pectineal line, this is also divided close to the bone and sutured to Poupart, and thereby much additional strength is given to the inner part of the posterior wall of the canal. In tying these sutures, the "relaxing" suture is first tied and the others after it.

An assistant now draws upon the testicle so as to stretch the cord, and three or four sutures are passed external to the latter between the oblique and Poupart so as to draw the muscle down in front of the cord (see Fig. 3).

6. The cremaster flap is drawn upwards and inwards as far as possible, and sutured to the anterior surface of the internal oblique and of its tendon over the rectus by deep as well as marginal sutures. (The appearance of the wound at this stage is shown in Fig. 4.)

Fig. 4.

7. The aponeurosis of the external oblique is now sutured as close as possible; a buried suture is used for the subcutaneous tissue layer, and finally the skin is sutured.

RESULTS.

Twenty patients have now been operated upon by me in this manner, and although no great interval has elapsed since the first case was so treated, there is no instance of any recurrence of the hernia.

All the cases have been seen frequently, and the region of the operation in every one is firm and tight.

None of the patients after operation developed any thickening of the cord above the level at which the veins were ligatured; and the object for which that procedure was adopted appears, therefore, to have been attained. Oedema of the scrotum has been very markedly less than in my former experience, and only one of the patients developed a hydrocele.

I believe strongly in the advantage of a pad formed from the hernial sac as advocated by Sir William Macewen, and think that the method I employ for making it is a good one. In a patient recently operated upon who had both an irreducible inguinal and umbilical hernia, the inguinal was treated in the way above described in the first place, and when the umbilical hernia was dealt with I took the opportunity of examining the state of the inguinal region from the abdominal aspect, and found the closure to be as accurate as it could possibly be. The peritoneal pad was tight and hard and rounded, projecting above the surface of the abdominal wall at the internal ring like one-half of a small ball.

There is no transplantation of the cord which forms such a prominent feature of the Bassini-Halsted operation. I take every care that the cord shall cross Poupart's ligament at its normal situation. The cord, however, in my operation is practically reduced to the vas and its own vessels, for by tying and dividing the veins I get rid of them as venous channels as completely as if they were actually excised; the amount of tissue they represent in their collapsed condition is very small indeed, so that the opening through which the cord has to be transmitted beneath the internal oblique is of the smallest diameter.

My reason for dealing with the veins in this way is that I believe it offers the best means of preserving intact the nerve to the cremaster. Normally this nerve runs in close proximity to the spermatic veins at the posterior and outer part of the cord; if it can be preserved the substance of the cremaster flap will thereby be preserved, and in that case will be of much greater value than it can be if it atrophies, as must happen if the nerve be destroyed. When the cremaster flap is sutured into position on the surface of the oblique it is drawn both upwards and inwards a little further than its

actual natural position (compare Figs. 1 and 4); the two structures mutually support each other, and form a small canal in which lies the vas along with the collapsed veins. The flap remains a taut layer, always, as I have found, of a definite value, which, however, will vary in different cases. I have been struck with the degree of contraction possessed by the fibres of what at first sight looks like an attenuated and thin muscle. After the flap is cut and dissected down it will contract into quite a compact layer.

I have quite recently learned that an account of an operation somewhat similar to what has just been described was published by Halsted in the *Johns Hopkins Bulletin* for August, 1903: it constitutes a very marked modification of the operation which has hitherto been known by his name. In his new operation Halsted removes the sac, excises the veins, and employs the cremaster as an additional layer of tissue much in the same way as I have done; but he places it deeper than the internal oblique, suturing it to the under surface of the latter.

It appears to me to be distinctly preferable that the flap made of cremaster and the other fasciae should be placed in front of the internal oblique; it does not interfere in any way with the suturing of the oblique to Poupart's ligament, and it has, as it seems to me, this great advantage, that nothing remains except the vas—and in my operation the empty veins—to be passed beneath the inferior border of the oblique. Whereas if it be placed deeper than the oblique there will be a puckered-up portion of these fasciae to be transmitted, and consequently, a less close approximation of the oblique to Poupart is possible, unless the flap is cut away from its prolongation into the scrotum—a procedure which I do not gather from his description is carried out by Halsted.

Excision of the spermatic veins is, I believe, absolutely certain to lead to division of the cremasteric nerve and consequent atrophy of the cremaster fibres, a result which in my method I have all along done my utmost to avoid, and as I believe with success, for several of the patients have shown a good cremasteric reflex after operation.

FEMORAL HERNIA.

In my operations for this variety of hernia after freeing the sac I return it in the same manner as above described so as to invaginate and "ball" it. Then I make a longitudinal incision at the inner part of the femoral sheath, so as to open the venous or middle compartment, free the inner border of the femoral vein with the handle of the knife and draw the vein outwards. Then pass a needle carrying a strong catgut suture from the venous compartment (and therefore to the outer side of the septum between it and the "femoral canal") through the pectineus muscle, and bring it out close to Gimbernat's ligament; the two ends of the suture are then passed from below upwards through Poupart, and, at the inner side, through Gimbernat.

This suture lies entirely outside the walls of the femoral canal, and when it is pulled up and tied closes the latter completely; no chink is left between the margin of the ring and one of the sutures through which a hernia can wedge its way.

Further closure of the canal and reinforcement of this deep suture are obtained by two or three interrupted stitches which are passed between Poupart and the pubic portion of the fascia lata over the pectineus, and the wound is closed by suturing the subcutaneous tissues and then the skin.

No case which I have operated upon by this method is known to me to have had a recurrence of the hernia.

ON GASTRO-JEJUNOSTOMY FOR PYLORIC STENOSIS, GASTRIC ULCER AND SOME OTHER NON-MALIGNANT CONDITIONS.

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My observations will not be rigidly circumscribed to the title of my paper as there are operations similar in purpose to gastro-jejunostomy to which I must briefly refer, so also some other conditions than actual pyloric stenosis and existing gastric ulcer will be considered, as duodenal ulcer, for instance, and hour-glass stomach. The radical procedure of excision of the pylorus or some other area of the stomach I have, however, purposely excluded as these would expand my remarks to undue length. In my own hands gastro-jejunostomy has

been performed for a variety of conditions which I will classify into three groups:

1. For stenosis of the pylorus, for hour-glass contraction of the stomach, or for a stenosis of the duodenum in each case to allow the contents of the stomach to pass freely into the intestinal tract and thus provide relief to gastric stasis with its distressing symptoms and the incapacity for work which it brings.

2. For the purpose of putting the stomach at rest, to stop haemorrhage from ulcers, whether situated in stomach or duodenum, with the intention also of relieving pain and procuring the healing of the ulcers.

3. For atonic dilatation of the stomach with marked proptosis it being hoped that the substitution of a passive opening for the pylorus, and at a more dependent position of the stomach, would relieve the organ of its burden of overfullness and consequent pain and vomiting. Chronic dyspepsia, without evidence of gastric ulcer or dilatation, has also thus been treated as a refuge when no relief was obtained by dieting or other medical measures.

How far has gastro-jejunostomy fulfilled the purposes for which it was undertaken? The answer varies with the condition for which the operation was done. In simple uncomplicated stenosis of the pylorus or of some other part of the stomach (hour-glass contraction), the relief has been almost always complete and thoroughly gratifying, the more severe the symptoms the more marked the benefit. If, as is not rarely the case, the patient has been markedly neurasthenic, the full benefit of the operation has been somewhat delayed, and subsequently under stress of work or anxiety a threatening of the old symptoms of pain and vomiting has arisen due to gastric catarrh or to an easily exhausted nervous apparatus. With appropriate treatment these threatenings have passed off and the former condition of improvement has been maintained. Many in the group of patients now under consideration have attained a power of digestion so robust that I have been astounded by an account of what they can dispose of: happily their nutrition and power of work has been equally satisfactory.

When haemorrhage or pain due to gastric or duodenal ulcer has been the necessity for operative interference both symptoms have been relieved. The relief may be permanent, but I have had two experiences to the contrary. One patient was the subject of duodenal ulcer for which an anterior anastomosis was made with complete cessation of severe pain and bleeding which had produced extreme anaemia. At the end of two years, however, the ulcer extended and produced death by perforation. In another patient with gastric ulcer causing severe pain, relief was given by an anterior anastomosis, and a year later, when the patient appeared to be doing well, a sudden severe haematemesis caused death. The ulcer in this case was extensive and firmly adherent by its base to the liver and probably therefore a difficult one to heal, but as it was not possible to obtain a necropsy there is, of course, room for doubt whether this or some other condition produced the fatal haemorrhage. Neither of these ulcers could have been excised without great risk to life, but where excision of an ulcer is feasible its removal, in addition to gastro-jejunostomy, should be considered.

Group 3 in my classification mentions atonic dilatation of the stomach, and chronic indigestion, producing pain and vomiting unrelieved by medical treatment and dieting, without evidence of stenosis, ulcer, or dilatation of the stomach or duodenum. I have operated in one case of each kind. The example of atonic dilatation was in a woman, feeble, emaciated to a degree, and very neurasthenic. In the first instance I thought this patient's pylorus somewhat more rigid and narrow than in health, and regarding pyloroplasty as a less severe measure than anastomosis resorted to the former but without any relief to the symptoms. Later I performed posterior gastro-jejunostomy by suture, and though a good recovery followed the operation scarcely any benefit was derived from it: pain is still complained of after all kinds of nourishment, the stomach is still as dilated as formerly, reaching almost to the pubes, the neurasthenia is as profound as ever and the emaciation as extreme, but the patient does not vomit now. The patient with chronic indigestion was a man aged 28, engaged in laborious work, which he frequently had to give up owing to pain after taking food and vomiting, though at no time had he suffered from haematemesis. The patient was sent to me in 1901 as ordinary treatment had failed to relieve him, and at the General Hospital I opened his abdomen to see if an ulcer

existed in stomach or duodenum, but after careful search neither ulcer, stenosis, nor dilatation of the stomach was found and the operation was finished as a mere exploratory one. He seemed better for a time, an improvement due probably to rest in bed and very careful dieting, but in six weeks the patient was as bad as ever. For months he haunted the out-patient room complaining of the old symptoms, and in February, 1902, I readmitted him for observation. Whilst he was in bed he did not vomit, but when allowed to get up and move about the ward, pain in the epigastrium occurred every day and was followed by vomiting. In March, thinking that I might have missed an ulcer at my previous examination, I re-opened the abdomen, and again could find no gross lesion, but lest I should have overlooked anything I did a posterior gastro-jejunostomy by suture, unfortunately without benefit and the man is still under treatment in the medical out-patient department. The result then in this limited group of cases has been discouraging.

Taking the whole of the cases together, pyloric stenosis has been the reason for surgical interference in a large majority. How this particular stenosis arises is not clear, whilst in some instances it is due to the cicatrix of healed ulceration; in most this is probably not the correct explanation. The local condition usually found is a pylorus which will only admit just the tip of the little finger, the opening feels like a button-hole, the surface layers of the stomach over the pylorus are supple and not infiltrated, there is no puckering or scarring on the peritoneum. This condition appears to be brought about by persistent spasm of the pylorus, initiated by an ulcer at a less or greater distance from the pylorus, or by excess of hydrochloric acid in the gastric secretion, perhaps in some cases ulcer and hyperchlorhydria coexist. I show you a specimen which illustrates these points, taken from a patient who died nine days after anastomosis by Murphy's button. At the necropsy the pylorus admitted a No. 10 catheter with difficulty, a chronic ulcer existed on the anterior surface extending across the lesser curvature to the posterior surface, where it was adherent to the pancreas, having perforated all the coats of the stomach; the ulcer came near to but did not involve the pylorus; the circular muscle of this orifice appeared to be much hypertrophied and fibrosed. Dr. Saundby's note states that free HCl was present to the extent of 0.0357 per cent., that is, it was in excess.

The signs and symptoms of pyloric stenosis are quite definite in the later stages when the stricture is well marked and the dilatation and proptosis have advanced to an extreme degree, associated with in some cases a good deal of hypertrophy of the muscular coat. The story generally told by these patients is one of long-continued indigestion, with pain and vomiting at varying time after the ingestion of food, sometimes of haematemesis or melaena. The vomiting eventually may not be constant, but occurs at intervals of a day or two, large quantities then being brought up with food material very incompletely digested though it might have been taken days before. When the stomach is artificially distended its lower border will be found some inches below the umbilicus, and its upper border is also displaced downwards, showing proptosis as well as dilatation. When the stomach is palpated, and sometimes even when it is not, powerful waves of peristalsis may be seen crossing the organ from left to right. There may be intermission of the symptoms after careful dieting, and especially when the patient is resting in bed, but a return to activity starts the whole train over again. In such cases there is clearly a mechanical obstacle to the emptying of the stomach and a definite thickening may be palpated about the right rectus. But this is the condition of the patient after much suffering, great loss of weight, and inability to work. These severe cases when submitted to operation, if they recover, are enormously benefited, and are restored to health and active life, but because of their enfeebled condition they are exposed to undue risk from operation, and by earlier surgical interference might not only escape this risk but much misery and disability.

Dr. Saundby is of opinion that the minor degrees of obstructive dilatation are often overlooked as in them the classical symptoms, periodic vomiting, and visible peristalsis are absent, and the symptoms are ascribed to chronic gastritis. He holds that the only way to avoid this mistake is by the systematic employment of inflation in the examination of stomach cases. But dilatation of the stomach is not always dependent upon pyloric obstruction, and where it is due to simply atony experience shows that surgical interference does not give good results. It is, therefore, important

to determine whether obstruction exists or not. Dr. Saundby believes that this may be done by the examination of the contents of the fasting stomach twelve hours after a test meal of bread and meat. He recommends a supper of bread and meat, usually minced meat, to be given at 9 o'clock at night, and at 9 o'clock the next morning the stomach tube should be passed and the stomach emptied. If there is no obstruction the stomach will be completely free from even microscopical traces of food. If there is slight obstruction there may be traces of food, the amount of residue being in proportion to the degree of obstruction. This method has been too recently introduced to enable a final opinion to be given as to its value, but it seems to be based on sound principles and has proved trustworthy in several cases transferred to me by Dr. Saundby for operation.

The earlier recognition of gastric stasis leading to earlier relief by surgical measures is what we should aim at; patients should not be allowed to go on for years in more or less constant distress becoming more and more unable to perform their duties in life, and having to face an operation of some risk at the end. Early operation, in this as in so many other conditions, means safe operation. That the operation must be one of small mortality I fully concede, how this is to be secured I have just indicated. With these general observations on the kind of cases requiring operation, the benefit conferred by gastro-anastomosis, derived from an experience which now extends over about seven years, and the necessity for early operation in pyloric stenosis I turn to the methods of operating. First, let me say a few words as to the rival operations of pylorodiosis or stretching the stricture and of pyloroplasty by which it is incised and subsequently sutured, in either case for the relief of pyloric stenosis. With regard to the first mentioned, in my opinion it should be absolutely abandoned; if dilatation is thoroughly performed the risk of splitting the peritoneal coat and causing a fatal peritonitis is considerable, if the stretching is less complete the stricture is apt to recur quickly as in one of the cases I shall presently relate.

Pyloroplasty is a much better operation than that just alluded to, and is an occasional alternative operation to gastro-jejunostomy. When there is a choice between the two some surgeons prefer it to gastro-jejunostomy, but this is a preference I do not share, the results attained by it in my cases have not been as satisfactory as those brought about by anastomosis, consequently I rarely resort to pyloroplasty. On the making of an anastomosis between stomach and jejunum much ingenuity has been expended and very numerous methods suggested—a sure sign of dissatisfaction with most if not all. I do not propose to occupy your time with a full discussion of these, but will quite briefly summarize the matter and give the conclusions I have arrived at.

First, the union may be made either with the anterior or the posterior surface of the stomach. My earlier operations were all made with the anterior surface, either by means of suture alone, by suture with the aid of a bobbin, or by Murphy's button. The subsequent course was nearly always an anxious one owing to interference with the onward passage of the intestinal contents between the pylorus and the anastomosis, with resulting regurgitation of bile and pancreatic secretion into the stomach and vomiting. In some cases death appeared to me to be brought about directly in feeble patients by this vomiting. This "vicious circle," as it is termed, seemed due partly to the awkward displacement of the jejunal loop when it is brought out of its usual position from the back of the abdominal cavity to the front of the stomach and partly to the drag of the transverse colon, with its constantly varying distension, around which the portion of jejunum is brought to apply it to the stomach. For the last two years I have, therefore, abandoned the anterior anastomosis unless I have been driven to it by some diseased condition which forbade a posterior junction. The posterior union may be carried out in various ways, each having strong advocates in whose hands the method recommended has given very good results. In France the "*methode en Y*" is much practised. This requires a complete section across the jejunum, the junction of the distal end with the stomach and of the proximal end into the side of the distal portion of the jejunum. This elaborate plan was devised to prevent regurgitant vomiting, but as it involves the risks of a double anastomosis I have personally not practised it. We then have left the choice of posterior union by suture alone, by suture with the support of some absorbable material such as Robson's bone bobbin or by the use of Murphy's button. Each has some advantage and some disadvantage. Suture takes longer

to apply than does Murphy's button and is more apt to be followed by regurgitant vomiting, as will be exemplified later on, but it leaves no foreign body in the stomach or to be passed out by the bowel with possible risk of ulceration or obstruction. The bobbin helps, I think, to prevent regurgitant vomiting, but is a rather inconvenient object to suture round owing to its bulk, and in a case which I shall presently mention its use was followed by death from haemorrhage. Murphy's button is quickly applied, and its use is generally followed by an easy recovery with very little, if any, regurgitant vomiting. It may, however, produce obstruction if it escapes down the bowel, a point which I shall presently illustrate, and it may cause perforation about the line of union with fatal peritonitis. If retained in the stomach, as the button often is, it is doubtful if harm happens.

In the choice of methods just alluded to I am not in a position to speak dogmatically, though my judgement, on the whole, is in favour of suturing, still I cannot ignore the easy recovery generally associated with the use of Murphy's button nor can I forget the briefer time occupied in applying the latter when the patient is very feeble, as not infrequently happens, and even a quarter of an hour's prolongation of the anaesthetic is a serious addition to the risks of the operation. In a few cases, too, it is more convenient to use the button because anatomical or diseased conditions allow only of small exposure of the posterior stomach surface with scarcely room for satisfactory suturing as in a patient whose case will be described presently where there was widespread adhesion from an old perforation.

I will not weary you with full details of all the cases in which I have performed posterior gastro-jejunostomy for innocent conditions, though a few I must describe at some length, but I wish to record my results by this method and to urge its general adoption. I have done the operation 18 times with 2 deaths, 8 of them were by suture only with no death, 2 were by suture and absorbable bobbin with 1 death and 8 were by Murphy's button with 1 death. So much as to the safety of the operation.

The cause of death in the case anastomosed by suture and bobbin was haemorrhage into both stomach and peritoneal cavity, the source of which could not be discovered. There was nothing in the patient's history suggestive of any haemophilic tendency, the operation presented no difficulty, and the suture was carried out exactly as in the other cases. Since this accident I have taken even more precaution to ligature any tiny vessel divided in the transverse meso-colon and to close by ligature or suture the vessels divided in the stomach wall. The other death was due to the Murphy button ulcerating through the junction on the ninth day after operation. The patient, a male aged 52, had emaciated and lost strength very rapidly the few days preceding operation, and I am perfectly convinced that his days were lengthened rather than shortened by the operation. My reason for not suturing in this case was the absolute necessity of saving every minute possible at the time of operating, and for the next 24 hours the patient was so feeble that it seemed impossible that he should struggle through, but stimulants and very early feeding by the mouth carried him through this extreme depression. When nutrition is at so low an ebb repair can hardly be carried out in a satisfactory manner, and this no doubt in part, if not entirely, explains the perforation at the line of union. It makes one inclined in future to run the immediate risk which suturing with its greater consumption of time implies but, perhaps, the most useful lesson of the case is the necessity for earlier operation.

As to ease of recovery, I find that in 8 cases of suture troublesome vomiting occurred in 4, in 1 of them presently to be described a secondary anastomosis between the portion of jejunum above and that below the union with the stomach was necessary to save the patient's life. In 2 cases treated by suture and bobbin troublesome vomiting did not occur in either. In 8 cases anastomosed with Murphy's button troublesome vomiting occurred in none.

As to the subsequent patency and efficiency of the opening it appears to me to matter little how the union is effected. I have patients going about in comfort and taking ordinary diet years after the anastomosis was made and without any suggestion of narrowing of the anastomotic opening whatever method was used.

I now propose to describe the chief details of the operation. Little preliminary preparation of the patient is necessary, nothing beside milk is allowed for forty-eight hours before the operation, all mouth feeding is interdicted after 6 o'clock in

the evening preceding operation, and nutrient enemata are then commenced and repeated every four hours. Stomach washing is never resorted to, a few patients do not resent it, but to the majority it is very disagreeable and occasionally distressing. Cultivations made from 15 of my cases by my friend, Dr. Hewetson, show that the contents of both stomach and jejunum are generally free from bacterial life under the conditions above mentioned. Of the 15 cases 9 gave no growth at all from the stomach or jejunum. In the cases in which growth occurred torulae and staphylococci were each found three times, bacilli, the exact kind undetermined, five times, and streptococci once. Even if washing out were resorted to I doubt if it would have much effect on any organisms in the stomach, and it certainly would have none on those in the jejunum.

To gain access to the stomach the abdomen is freely opened in the middle line, the transverse colon and great omentum are turned upwards, the transverse mesocolon is divided, care being taken to avoid the arches of vessels supplying the colon, and the posterior surface of the stomach is seen. Lying close to it is the junction of the duodenum and the jejunum to the left of the vertebral column. A portion of jejunum not less than 12 in. from this junction is selected for the anastomosis, it is emptied and lightly clamped with Doyen's forceps so as to control its canal and its circulation. A pouch of stomach, drawn through the opening in the mesocolon, is similarly treated and the parts surrounded by sponges are as far as possible brought outside the peritoneal cavity. The junction is made by two rows of sutures, the outer, including peritoneum and muscle, is interrupted once when it has completed a half circle and is then laid aside. Stomach and jejunum having then been opened, and the larger vessels in the stomach incision ligatured, the second suture is applied including all the coats, and it makes a complete circle without interruption. The parts have been held in apposition by an assistant who manipulates the clamp forceps, and at this point the forceps may be taken off before the outer row of suturing is resumed and completed. The parts are swabbed over with normal salt solution and returned into the belly. Recently I have adopted a suggestion of Littlewood's, of Leeds, removing some of the redundant mucous membrane of stomach and intestine before making the second row of sutures, but I have not yet had sufficient experience to approve or condemn this. I may here state that in no case of gastro-jejunosomy, however the anastomosis has been made, have I had a death from septic peritonitis set up by the operation. Indeed, in all cases, both anterior and posterior, numbering about 40, there has been only death due to faulty technique, namely, the one due to haemorrhage which I have already described. The after-treatment is simple.

Nothing is given by the stomach for a few hours, then sips of hot water are allowed, and at the end of twenty-four hours tablespoonfuls of milk and water are taken every half hour. This is steadily increased until by the end of the fourth day a couple of pints of milk per diem are being disposed of, custard, beef tea, or similar food is then added to the diet. On about the tenth day minced meat or chicken is allowed and additions are gradually made until at the end of three weeks an almost ordinary diet is taken. This is subject to variation in patients who suffer much from regurgitant vomiting and is modified also by the condition for which operation is undertaken as, for instance, active ulceration still present in the stomach.

I have already given the number of my cases operated on by posterior gastro-jejunosomy, the general results of the operations, and a few other details.

The following are a few of the more remarkable included in my list of cases, and are introduced in detail to illustrate some particular points:

CASE I. *Failure of Pylorodiosis: Complete Relief by Posterior Gastro-jejunosomy.*

History—Miss K., aged 29, sent to me November 24th, 1901, by Dr. Martin, of Stourport, with a history extending over four years, during which time she had been subject to pain in the stomach immediately after taking food, and vomiting, but at no time had there been haematemesis. Two years before I saw the patient a surgeon in London had opened her abdomen, but the incision was merely exploratory and nothing else was done. In April, 1901, another surgeon in London reopened the abdomen and finding a stenosis of the pylorus did Loreta's operation of stretching the stricture which gave relief to the symptoms, but by August, 1901, the patient was as bad as ever.

Condition when First Seen.—The only food the patient could take without vomiting was milk; when in bed and taking milk she was free from pain, but was always in pain when up and about. The lower border of the stomach when it was distended reached more than

half-way down between umbilicus and pubes; in the epigastrium nearly 2 in. above and slightly to the right of the umbilicus a slightly tender and movable mass measuring about an inch in all directions could be felt, there was no visible peristalsis of the stomach. Discomfort in the region of the left kidney was complained of and the organ was found to be freely movable.

Operation.—On November 26th, 1901, I opened the abdomen and found the pylorus densely thickened, and it evidently formed the mass felt from the outside. Posterior gastro-jejunosomy was performed by suture and Robson's bone bobbin.

After-history.—The operation was well borne; the patient vomited a little during the next two days, and not at all afterwards. Her recovery was quick and easy; she was soon able to take ordinary diet, has continued to do so since, and leads an active life.

In October, 1903, Dr. Martin wrote to me, in answer to my inquiry, and said that the patient is very well indeed.

CASE II. *Pyloric Stenosis, Pyloroplasty: Relief for a Time; Relapse: Posterior Gastro-jejunosomy by Suture: Persistent Regurgitant Vomiting: Secondary Anastomosis: Recovery.*

History and Condition.—Mrs. C., aged 41, was admitted to the General Hospital on May 21st, 1902, for pain in the stomach and vomiting. Her illness began eight months previously with several attacks of haematemesis, accompanied by pain in the stomach after taking food. When admitted only fluid nourishment could be taken, as had been the case for months, and even this caused vomiting about twenty minutes later. The stomach was dilated until its lower border reached about 3 in. below the umbilicus. The patient was very neurotic; she suffered from palpitation, from prolapse of the uterus; the period was irregular, the bowels constipated.

First Operation.—On May 26th the abdomen was opened and a stenosis of the pylorus found, which would only admit the tip of the little finger. Pyloroplasty was performed and a good recovery ensued, with fairly complete relief to the symptoms, but by the end of the summer the patient's complaints of pain and vomiting were as bad as ever.

Readmission.—She was readmitted on September 26th, 1902, with pain in the stomach, vomiting, and haematemesis.

Second Operation.—Posterior gastro-jejunosomy was performed on October 6th by suture, and during the following seventeen days persistent regurgitant vomiting occurred, varying from 1 to 3 pints, the last-mentioned quantity being vomited on October 23rd.

Third Operation.—As the patient was rapidly losing ground, becoming thinner and feebler, the abdomen was reopened on this day. The portion of jejunum between the duodenum and the anastomosis was found hugely dilated, so a secondary anastomosis was made between it and a portion of jejunum beyond the anastomosis.

After-history.—Some ounces per diem were vomited for the first few days, the largest amount in any day being 7 oz. Then matters settled down, and the patient was discharged on November 9th, able to take ordinary diet.

CASE III. *Pyloric Stenosis and Hour-glass Stomach: Pyloroplasty and Posterior Gastro-jejunosomy.*

History—Mrs. D., aged 47, sent to me by Mr. Macleod, of Shrewsbury, with pain in the stomach and back and vomiting, became an in-patient at the General Hospital June 13th, 1903. For several years she had been subject to attacks of pain in the stomach and back, accompanied by vomiting, with intermissions lasting three or four weeks. Latterly the periods of relief had become shorter, until finally the pain became continuous and was quite independent of taking food, but was relieved by vomiting, the vomit at times being very large in amount. The patient had been carefully dieted and treated, most relief being afforded by lavage of the stomach, but latterly this had failed and there was steady loss of weight. Distension of the stomach with CO₂ did not show any extreme dilatation, but there was a marked notching in the distended organ suggestive of hour-glass constriction.

Operation—June 15th the abdomen was opened and a double condition found, namely, a narrow stenosis of the pylorus and a severe constriction of the stomach about the junction of the middle third with the pyloric third of the organ. The first condition was relieved by pyloroplasty, the latter by posterior gastro-jejunosomy between the proximal portion of the stomach and the jejunum. Being driven by the contraction much nearer than usual to the cardiac end of the stomach only a small area of the posterior surface could be exposed without risk of injury to the arterial supply of the colon. This space seemed insufficient for a safe anastomosis by suturing, so a 1 in. Murphy button was employed.

After-history.—An excellent recovery followed the double operation, and the patient was discharged from hospital at the end of a month taking ordinary diet in comfort. A month later she was threatened with an attack of intestinal obstruction due to the button, but this was voided in a day or two, and for five months all went well, weight and vigour were gained and the patient resumed her ordinary household duties. Quite recently she has experienced a new pain immediately under the left costal arch, and vomiting has occasionally happened. It is not evident yet to what this relapse is due, whether to adhesions outside the stomach, to fresh ulceration, to contraction of the anastomotic opening, or possibly to some transient condition which careful dieting and management will put right. The patient is now well again.

CASE IV. *Huge Thickening around Gastric Ulcer Simulating Malignant Growth: Posterior Gastro-jejunosomy with Rapid Diminution of the Swelling and Complete Relief to Symptoms.*

History.—In October, 1903, I was asked by Dr. D'Abreu to see a Mrs. R.,

aged 43, who was suffering from pain in the stomach and vomiting. The history extended over six years, but there was at times intermission of the symptoms, but never permanent relief; at no time had there been haematemesis or melaena.

Condition when First Seen.—The patient was extremely emaciated, had been confined to bed for some weeks, and subsisted entirely on milk. No other food of any kind could be tolerated, and even with milk alone she occasionally vomited a large quantity of fluid. The stomach appeared to be much dilated, reaching nearly to the pubes, and peristaltic waves could be seen passing across it from left to right. In the umbilical region was a mass larger than one's fist, which appeared to be closely attached to the stomach, it was firm, rather lobulated and tender, the mass moved with some freedom in the lateral but only slightly in the vertical direction; the patient was extremely anaemic and weighed only 4 st. 9½ lb. The vomit and the motions were free from blood. The long-continued history, the mobility of the stomach tumour, and the absence of cachexia such as is associated with advanced malignant growth, led me to believe that I had to deal with a case of chronic ulcer with massive inflammatory thickening around, and I proposed gastro-jejunostomy for the relief of the condition.

Operation.—On opening the abdomen on October 26th, 1903, the large mass felt through the parietes was found to occupy that portion of the stomach near to but not involving the pylorus, the tumour was pinkish in colour, as from inflammatory injection, and it was markedly oedematous. A posterior anastomosis was quickly made with Murphy's button as the pulse was very feeble and quick, running up to as high as 120.

After-history.—This was entirely uneventful, the patient was never sick, the tumour mass shrank rapidly appearing by the eighth day to be reduced to about half its former size; on the twentieth day the patient's weight had increased 9 lb., and she left the hospital on the twenty-third day after, taking solid food. Since that time she has continued to thrive, can do her household work, and has gone up in weight from 4 st. 9½ lb. to 8 st. 3½ lb.

CASE V. *Perforation of Gastric Ulcer: Excision of Ulcer: Recovery: Recurrence of Stomach Symptoms: Pyloric Stenosis Found: Posterior Gastro-jejunostomy: Recovery.*

History.—B. P., aged 24 years, was sent to me by Dr. Mary Hamilton-Williams, and was admitted to the General Hospital on January 6th, 1904. In March, 1902, she had been treated at the Liverpool Infirmary by Mr. Hamilton for a perforated ulcer on the anterior wall of the stomach; the ulcer was excised. Prior to that she had suffered from indigestion for seven years, with periodical attacks of vomiting, and at times haematemesis. Following the operation just mentioned the patient had a period of comfortable digestion which lasted a few months, then the old pain began to return, and vomiting a little later, whilst on three occasions blood was vomited, the last time being about three months ago. The pain came on very soon after taking food, and was generally relieved by vomiting.

Condition on Admission.—The patient was anaemic but well nourished: the bowels were constipated: the period was irregular. There was no evident dilatation of the stomach; no definite thickening could be felt in it, but there was some degree of tenderness all over the upper zone of the abdomen. Milk could be taken as a diet with freedom from pain and vomiting, if the patient was absolutely recumbent, but if she resumed active habits even milk gave rise to pain and vomiting; if she remained in bed, no other food but milk was tolerated.

Operation.—On January 18th, 1904, posterior gastro-jejunostomy was performed with difficulty owing to the very widespread adhesions from the old perforation. Only a small area of the posterior surface of the stomach could be exposed—too little to allow of safe suturing and a sufficiently large anastomotic opening, so the union was made by a 1 in. Murphy button. The pylorus was so narrow as only to admit the tip of the little finger; whether an active ulcer existed in any part of the stomach it was impossible to determine, but none was felt.

After-history.—An easy recovery followed; the patient vomited about 2 oz. of watery fluid the day after operation, and not again; the button was passed on the sixteenth day, and on the twenty-third day the patient was discharged from hospital, taking practically an ordinary diet, and free from all discomfort.

CASE VI. *Duodenal Ulcer: Gastro-jejunostomy: Complete Relief to Pain and Bleeding.*

History.—J. M., aged 32, was sent to me by Dr. Martland of Walsall, and was admitted to the General Hospital on January 20th, 1904, complaining of severe and persistent pain in his back, of vomiting, and loss of weight. The history extended over about six years, although four years earlier still vomiting of blood had given rise to a suspicion of gastric ulcer. In the earlier part of this time the symptoms were intermittent and the patient was generally able to work, but for some months prior to admission he had been much worse, especially in regard to pain, and had been entirely disabled from work.

Condition when First Seen.—The pain was experienced chiefly to the right of the lumbar spine, passing occasionally round to the umbilicus; it was often worse when lying down. To the right of and some 2 in. above the umbilicus there was a persistently tender spot, but no tumour was palpable nor was there any unusual pulsation. The urine was normal, as was the function of micturition; there was nothing in the history suggestive of biliary colic; the patient had never been jaundiced. Vomiting occurred at irregular intervals and gave some relief to the pain, but the pain and vomiting appeared to be independent of food taking. The patient denied any haematemesis for some years, but the guaiacum test showed the presence of blood in the vomited

matters, and examination of the stools showed that a considerable quantity of blood escaped by the bowel. The patient was very anaemic; he was neurasthenic, and presented the appearance of a man who was gravely ill; morphine was required at night to procure any rest.

Operation.—Duodenal ulcer was diagnosed, and at the operation a dense thickening over an area of about an inch in diameter was felt in the second portion of the duodenum mainly in the posterior surface, but encroaching somewhat on the outer wall. Posterior gastro-jejunostomy was performed.

After-history.—An absolutely uneventful recovery has followed, entirely free from regurgitant vomiting. Pain has been entirely absent except on one occasion after an indiscreet meal; no morphine has been required, and there has been no further loss of blood by the bowel. At the end of nineteen days the patient was up and about in the ward taking the ordinary house diet; he was discharged apparently well on February 18th, and has since been in excellent health.

ACUTE INTESTINAL OBSTRUCTION CAUSED BY SYPHILITIC ULCERATION IN THE ILEUM.

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E. L., aged 23, labourer, was admitted to the ophthalmological department of the Montreal General Hospital on August 20th, 1903, suffering from extensive ulceration of the left upper eyelid. This trouble, he stated, began about one month prior to admission in the form of a small, painless papule on the lid, which so rapidly increased in size that the surrounding swelling of the lid prevented him from opening the eye. The affected area on the summit of the lid then broke down, forming a spreading painless ulcer, which showed no disposition to yield to topical healing remedies.

State on Admission.—The patient, a fairly well-nourished young man, not markedly anaemic, showed three ulcerating patches, almost coalescing, on the left upper eyelid, one about the centre of the lid, ¼ in. above and parallel to the ciliary margin, 1 in. long and about ¼ in. wide. The second, near the outer canthus, was circular, and about ½ in. in diameter. The third was at the inner canthus, somewhat smaller and elongated. All three were depressed, had sharp, punched-out edges, with unhealthy bases and absence of granulations. The skin of the upper lid was congested, but there did not appear to be any tendency to infiltration. The skin of the lower lid was unhealthy looking, and at the outer side of the eye there was a well-marked conjunctivitis.

Abdominal Attack.—A few hours after his admission to the hospital he developed acute abdominal symptoms, the first thing noticed being a sharp intermittent pain at the umbilicus coming on half an hour after a stool. He next felt nauseated, but could not vomit. Rectal tenesmus was persistent. He passed urine normally. The pain became continuous, and as the abdomen was becoming markedly distended and rigid, and the patient's general condition one of collapse, I was sent for in the night to see him. I found him very depressed and mentally dull, with shallow breathing, rapid pulse, and subnormal temperature (97°F.). The abdomen was moderately distended, rather more about the umbilical region than elsewhere; marked rigidity of abdominal muscles, especially in the epigastric region, but tenderness only to a moderate degree, and with no point of maximum tenderness. There was no vomiting, but occasional hicough. I got the history as given above, and was assured by the medical superintendent that the patient was hourly growing worse, as indeed I saw for myself. A careful urinalysis gave us no clue to the condition. I therefore determined upon an exploratory laparotomy as the only means of clearing up the diagnosis, and of possibly saving the patient's life.

Operation.—He was taken at once to the operating room, where, under ether anaesthesia, the abdomen was opened by a 3 in. median incision, below the umbilicus. In the peritoneal cavity was a moderate amount of turbid, yellowish, odourless sero-purulent fluid, in which floated a number of large jelly-like pieces of fibrin. The peritoneum was injected, but no ulcerating areas could be seen. The ileo-caecal valve being found, the colon, caecum, and adjacent part of the ileum were found collapsed and the appendix normal. This showed that the obstruction was higher up and in the small bowel. On tracing up the collapsed ileum no enlarged gland or Peyer's patches or other evidences of inflammatory processes were noticed. At a point about two and a-half feet from the ileo-caecal valve the gut was bound down to the posterior layer of the peritoneum, and it was with some difficulty that these adhesions were separated and the ileum delivered through the incision. It was then seen that at this point the omentum, firmly adherent to the bowel in fully two-thirds of its circumference, grasped it like a band. This was evidently the site of obstruction, as the bowel above, markedly distended, overhung the constricting ring. The bowel above this point, for a considerable distance, looked very dark, and evidently contained blood. The omentum was carefully separated from the underlying bowel, to which it was attached by firm, old adhesions. But the separation of the adherent omentum in no wise freed the passage through the bowel, which was here completely obstructed by a firm nodular mass in its lumen. I accordingly proceeded to resect this part of the bowel, along with about 3 in. below it, which looked discoloured and unhealthy. We found, as we expected, that the bowel above the