pancreatic fistula remained for several months. Health and weight fully regained. In October, 1903, reported to be quite well.

CASE XII.—July, 1901; female, aged 28. Had six years' history of increasing indigestion, dating from an illness described by the doctor as "ulcerated stomach." Pain comes on one hour after food, worse when lying on the right side. Vomits after nearly every meal. Is getting steadily thinner. Signs 1, 2, 3, 4, 5, 6, and 7 all present. At the operation an hour-glass stomach was found and very tight pyloric obstruction. Gastroplasty and posterior gastro-enterostomy into the distal pouch. The patient died. The patient was seen by Dr. Baxter-Tyrie of Keighley. Death from pneumonia on the fifth day. The anaesthetic was badly taken, lividity and rigidity of abdominal muscles being present throughout.

CASE XIII.—April 22nd, 1902; female, aged 42. Has had chronic indigestion. The symptoms came on gradually—pain after food, vomiting, and constipation. Eighteen months ago had haematemesis, and since then the symptoms have been greatly increased. Signs 1, 2, 3, 5, and 6 present, and a diagnosis of hour-glass stomach made. At the operation an hour-glass stomach (a perfect example) was found. The constriction in the body admitted the little finger snugly. In the narrowed isthmus, on the posterior surface, a densely hard indurated area, at least $\frac{1}{2}$ in. in thickness; the lesser and greater omenta both puckered up. Gastroplasty—a scar of the ulcer seen on mucous surface of posterior part. A very tight stricture found at the pylorus, the pyloric pouch being dilated also. Posterior gastro-enterostomy from pyloric pouch. The patient recovered. The patient was sent by Dr. H. H. Greenwood. A very rapid pulse for four days after operation. Report in October, 1903:—"Quite well; six months pregnant."

CASE XIV.—November 29th, 1902; female, aged 27. Nine years' history. Pain after food and vomiting were the symptoms first noticed. Soon all solid food caused pain, and was rejected. The food became "sour," and the gas belched up smelt putrid. On several occasions blood has been vomited. The signs and symptoms of hour-glass stomach were elicited, and a confident diagnosis made. The two pouches of an hour-glass could be distinctly seen on inflation. Signs 1, 2, 3, 5, and 6 present, and an hour-glass stomach diagnosed. At the operation an hour-glass stomach was at once exposed, but on tracing the stomach up to the cardiac orifice another stricture and another pouch were found. There were thus two annular constrictions in the stomach and three pouches. The first pouch was the largest, the pyloric the smallest, being only of the size of a lemon. Gastro-gastrostomy and gastro-enterostomy were performed. The stomach was scarred almost universally. The patient recovered. The patient was sent by Dr. Knowles, Newstead, Halifax. She made a most excellent recovery. In October, 1903, she had gained $1\frac{1}{2}$ st., and was taking food well.

CASE XV.—January 20th, 1903; female, aged 34. Nine and a-half years ago vomited a "great deal" of blood. Dr. Mackenzie then diagnosed ulceration of the stomach. Since then has always been ailing, especially after a moderate meal. Five years ago was very ill; had acute abdominal pain, severe vomiting, and haematemesis. Was in Manchester Royal Infirmary with "ulcer of the stomach." One year and a-half ago had haematemesis. For several years has taken no solid food, and has never had an ordinary meal. Has lived on milk, custards, porridge. On examination an hour-glass stomach was diagnosed. Woelfler's two signs; paradoxical dilatation; increase in subcostal tympany; gurgling sound at left end of stomach, all well-marked. At the operation an hour-glass stomach and an hour-glass duodenum were found. There were two large stomach pouches, united by a narrow isthmus, at the lesser curvature. Tight constriction at the pylorus; the first portion of the duodenum was dilated to form a sac the size of a lemon; beyond this another constriction. The pyloric pouch of the stomach was more densely scarred than any stomach I have seen: its texture was almost wholly fibrous. On its posterior surface also many scars were seen. Gastro-gastrostomy, and posterior gastro-enterostomy to the pyloric pouch. The patient recovered. The patient was sent by Dr. Mackenzie, Burnley. Within three weeks of the operation she ate solid food heartily and had taken all the vegetables in season.

CASE XVI.—July 14th, 1903; female, aged 35. For the last six years has had abdominal pain, to the left side of the epigastrium chiefly, especially after food. Has vomited every week during this time; and six years ago, three years ago, and in February, 1903, had haematemesis. Since February has had constant pain and vomiting; is unable to take any solid or semi-solid food, and but little fluid. Is wasting rapidly, and looks thin, haggard, and very wasted. At the operation an hour-glass stomach was found. A deep pucker on the anterior wall and upper surface, pulling the lesser curvature down to the greater. From the centre of the dense indurated stenosing ulcer, a thick band and a web of adhesions passed up to the liver. The posterior surface of the stomach also was very adherent, so that a posterior gastro-enterostomy was performed with great difficulty. The patient recovered. The patient was sent by Mr. Jessop, and operated upon in his absence. Her recovery was most satisfactory.

Malignant Cases.

CASE XVII.—March 3rd, 1901; male, aged 54. Vomiting of fluid if taken in quantities exceeding an ounce. At the operation an hour-glass stomach was found. Narrowing close to cardia due to malignant disease which had invaded the stomach everywhere (jejunostomy). The patient recovered. The patient was seen with Dr. Sykes, Cleckheaton. Died April 9th.

CASE XVIII.—July, 1901; female, aged 38. At the age of 17 had a gastric ulcer; vomiting and haematemesis for several weeks. Since then has always had gastric uneasiness. Ten years ago "an ulcer burst" after a long walk. She suddenly experienced acute pain in

epigastrium and fainted; during the subsequent night she vomited a "chamber utensilful" of blood, and latter coffee grounds material. Since this attack has never enjoyed a hearty meal. For last few months has lost flesh rapidly; for the last three years she has been in bed, and has not been able to take anything but milk and water, and has returned most of that. Gastric tetany in limbs. Free HCl present. At the operation an hour-glass stomach, nearer the cardiac than the pyloric end, was found. The stomach was adherent over an area about $2\frac{1}{2}$ in. in diameter to the anterior abdominal wall and liver. On detaching, the stomach was opened. The opening was about $1\frac{1}{2}$ in. in diameter, the edges over $\frac{1}{2}$ in. thick, and the mucous membrane greatly thickened and pouting. At the point of adhesion the stomach was markedly narrowed. The ulcer and a surrounding mass of stomach were excised and gastroplasty performed. Pylorus would only admit the passage of a director, and pyloroplasty was therefore performed. The patient died. The patient was sent by Dr. Cheetham, Guiseley. She seemed to be going on well until the fourth day when the pulse rapidly failed. The examination of the excised mass showed malignant disease to be present. The lower margin of the ulcer was greatly thickened by heaped-up granulation tissue, which, on microscopic examination, proved to be carcinomatous.

TREATMENT.

In many cases of hour-glass stomach there is a narrowing, not only in the body of the stomach, but also at the pylorus. This illustrates the undoubted fact that gastric ulcer is often multiple. The result, so far as the treatment of the condition is concerned, is that in many of the cases no single operation will suffice to fulfil all the requirements. If gastro-enterostomy is performed from the cardiac pouch, the pyloric pouch remains undrained. Symptoms of stasis are then observed, as in a case recorded by Terrier, and a second operation is necessary. An anastomosis from the second pouch is obviously futile. A gastroplasty which relieves the obstruction in the body of the stomach does not deal with the pyloric narrowing. In many cases it will be necessary to perform a double operation, gastro-enterostomy from both pouches, gastroplasty combined with gastro-enterostomy from the pyloric pouch, gastro-gastrostomy with gastro-enterostomy, or gastroplasty and pyloroplasty.

Thus I performed—

Gastroplasty alone in Cases, I, II, III, V, XI.

Gastro-enterostomy alone in Cases VI, VII, VIII, IX.

Gastroplasty and gastro-enterostomy, XII, XIII.

Gastro-gastrostomy alone in Case IV.

Gastro-gastrostomy and gastro-enterostomy in XIV, XV.

CONGENITAL NARROWNESS OF THE PYLORIC ORIFICE A CAUSE OF CHRONIC GASTRIC DISEASE IN THE ADULT,

ILLUSTRATED BY SEVEN CASES SUCCESSFULLY TREATED BY OPERATION.

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In operating upon various cases of chronic gastric derangement I have met with a condition of the pyloric orifice that seemed to me not only sufficient to explain the symptoms which existed, but to suggest that the condition itself was probably of congenital origin.

I shall possibly best introduce the subject by first narrating the history of the cases upon which the subsequent observations are based. It might be reasonably contended that the fullest details of every case should be given in order to eliminate all causes that might be considered, were they present to offer an explanation other than that which I shall venture to give. But I am compelled, in order to bring my contribution within reasonable limits, to introduce only such salient features in each case as appear to me fairly to support the views I hold.

CASE I.

Mrs. A. B., aged 31 years. Gastric symptoms commenced when 24 years old; were of a simple dyspeptic character. Later the symptoms were those of chronic gastric catarrh; much mucus present both in vomit and in motions; much emaciation, and relief only obtained by lavage; food generally caused pain. Dilatation occasionally present. No history of haemorrhage. Patient in good station of life and unable to account for the early appearance of her symptoms.

Operation.—On May 14th, 1902, in private home. Direct external examination of stomach negative. Internal examination, mucous membrane livid and coated with much mucus. Pyloric orifice with rather tight ring admitting index finger with difficulty. Posterior gastro-jejunostomy performed. Eighteen months after patient in excellent health, in every way a different woman.

CASE II.

Miss B. C., aged 46 years. Gastric symptoms as long as she can remember, chief symptom being occasional attacks of vomiting after food not accompanied with pain, but food causes a sense of weight in the epigastrium. Dilatation takes place if careful attention is not paid to diet and lavage practised. Patient much emaciated and in general feeble health. No history of haemorrhage, nor can any reason be assigned for the commencement of her early symptoms. In a comfortable position in life.

Operation.—On June 5th, 1902, in private home. Direct external examination of stomach and pylorus negative; internally a uniform ring-like constriction of pylorus admitting about a No. 12 urethral catheter. Posterior gastro-jejunostomy. Fifteen months after considerable and continued improvement.

CASE III.

Miss C. D., aged 20 years, one of a very healthy family. Gastric symptoms commenced when 14 years old in the way of ill-defined indigestion—the tolerance of certain foods and not of others. Laterally pained by food and relieved by lavage. Any indiscretion in diet brought on symptoms and caused gastric dilatation. No history of haemorrhage, or any other cause to explain why she should differ from other members of the family, who were all healthy. She lived in a good station in life.

Operation.—On October 20th, 1902, in private home. Direct external examination of stomach negative; internal examination, pyloric orifice contracted by a uniform ring-like constriction which would only admit the apex of the index finger. Posterior gastro-jejunostomy. Twelve months after in good health.

CASE IV.

Miss D. E., aged 27 years, one of a healthy family. Gastric symptoms as long as she can remember; a feeling of weight and general discomfort after food; no pain or vomiting, but attention to diet and occasional lavage always gave relief. The food took, as she said, about six hours to pass out of her stomach. Dilatation marked. No history of haemorrhage, or other cause to account for the onset of her symptoms. In very good position in life.

Operation.—On October 30th, 1902, in private home. Direct external examination of stomach and pylorus negative; internal examination pyloric orifice a uniform narrow tense ring which only admitted tip of index finger. Gastro-jejunostomy performed. Twelve months after, improvement continuing but so far not so marked as the other cases.

CASE V.

M. R., aged 21 years. Gastric symptoms commenced when 16 years old, and consisted of pain and vomiting an hour after food. Dieting improved her condition, but return to ordinary food brought on the attacks. Treatment never produced more than temporary improvement. No history of haemorrhage, or other cause to account for onset of symptoms. A dressmaker by occupation.

Operation.—On November 7th, 1902, in Victoria Infirmary. Direct external examination of stomach and pylorus negative; internal examination pyloric orifice uniformly contracted, admitting only the apex of the index finger. Posterior gastro-jejunostomy performed. Twelve months after never better in her life, and back to her work.

CASE VI.

Miss E. F., aged 27 years; gastric symptoms commenced a year and a-half ago, mostly with pain after food. She found that by limiting herself to milk and fluid diet she was freed from any discomfort, but any attempt at a return to ordinary solid diet caused a recrudescence of her symptoms. She always noticed that small quantities agreed with her much better than large. Dilatation was occasionally present. No history of haemorrhage or of other cause to explain onset of symptoms. Was of good complexion and fairly well nourished. In good social position.

Operation.—On November 27th, 1902, in private home. Direct external examination of stomach and pylorus negative; internal examination, pyloric orifice uniformly contracted to a narrow ring which hardly admitted the apex of the index finger. Posterior gastro-jejunostomy performed. Twelve months after, in excellent health.

CASE VII.

S. K., aged 27 years. Gastric symptoms commenced nine years ago, and were mostly of a simple dyspeptic character. Pain and vomiting sometimes present. Can only take milk and soups; solids, as butcher's meat, etc., caused pain and were vomited. Test breakfast showed free hydrochloric acid, and inflation marked distension. She is of a fresh colour, and fairly well nourished. No history of haemorrhage, or other cause to account for onset. Is a shop assistant by trade.

Operation.—On September 15th, 1903, in Victoria Infirmary. Direct external examination of stomach and pylorus negative; internal examination revealed a tight and uniformly ring-like constriction of the pyloric orifice which the index finger could not enter without force. No thickening or irregularity present to suggest old ulceration. Posterior gastro-jejunostomy performed. Two months after was in a convalescent home showing marked signs of improvement.

In operating upon these, and in most of my other gastric cases, I have to acknowledge the kind and valued assistance of my friend, Dr. J. Grant Andrew, Assistant Surgeon to the Victoria Infirmary.

The first point to which I should like to draw attention is the particular character of the constricted orifice met with in these cases; and before doing so I ought perhaps to state

what may be considered the normal condition of the orifice as met with by the surgeon on the operating table. Under complete anaesthesia the gastric parietes are more or less flaccid; the pylorus externally presents a line of somewhat deeper colour than the neighbouring parts; only the faintest constriction is visible, the duodenum often passing so imperceptibly into the stomach that it is only by the tactile sensation offered by the sphincter that the exact seat of the pylorus is detected.

There is no constancy in the amount of induration—if I may so express it—which the pylorus presents; a fact which seems to suggest that though the patency of the canal may be quite normal, there may be great differences in the developmental condition of the sphincter—differences possibly dependent upon the same physical causes which may naturally affect other parts of the body. I have little doubt that this variation has led to the difficulty experienced by some of determining whether the greater thickness met with in one case as compared with another was or was not due to some undue hypertrophic or inflammatory cause. I am, however, convinced that this variation is quite normal and may exist within considerable limits. Regarding the calibre of the pyloric orifice I have always found that, while the index finger passes easily, it has conveyed to it the sense of a uniform narrow elastic ring which feebly embraces and seems to roll over the finger as it is gently pushed onwards. I should consider from 12 to 15 mm. as the normal calibre of the canal during life and under relaxation (see Fig. 1). If one looks at a section of the pylorus, such for instance as is given in Quain's *Anatomy* by Allen Thomson, a sensation such as that above described is what might be reasonably expected. A uniform ring-like projection of mucous membrane is seen containing within its folds of reduplication circular bands of muscle fibre.

Fig. 1.—Diagrammatic longitudinal section of pylorus (natural size). a. Normal diameter of pyloric orifice—12 to 15 mm. b and c. Abnormal diameters—7 and 3 mm.

When in my earlier cases I first met with the abnormally narrowed condition of the canal I was inclined to believe that, if not due to chronic spasm, it was the direct result of the introduction of the finger into the pylorus; that such a solid substance as the finger within the stomach cavity was certainly likely to stimulate contraction of the pylorus, whose very function is to resist the passage of such indigestible objects as my finger presented. However, I had on one occasion when operating a very striking illustration of what both the stomach and pylorus is like under contraction. I had the stomach partly withdrawn from the abdomen with the pylorus in view; the patient seemed suddenly to come out of the anaesthetic when an almost violent contraction of the gastric parietes took place, causing a little of the clear fluid within the stomach to be forcibly spurted out. Immediately there followed contraction of the pylorus, which assumed the appearance of a rigid structure about 2 in. in length and about the circumference of the ring-finger. Pressing the anaesthetic soon relaxed the parts, and it was under this relaxed state that I felt a narrow uniform ring-like constriction at the pyloric orifice incapable of admitting the apex of the index finger.

It was the information gained in the observation of this particular case that led me first to doubt that these narrowed orifices were spasmodic in character; rather that they owed their existence more to some abnormality in development than to any acquired cause.

As to the nature of this abnormality, I am inclined to regard it as due to an excess of reduplication of the pyloric fold, whereby the valve width is increased but the orifice correspondingly diminished; that it is, therefore, purely anatomical and congenital in its origin. Such a definition entirely fits in with the facts revealed in the various cases above narrated; for the obstruction was always perfectly uniform and simply gave the impression that it was abnormally small, and the smaller it was the greater the resistance

it offered to the introduction and passage of the finger. Further, it may be noted that resistance was in no sense like that of non-giving cicatricial tissue. That, as is well known, rarely gives way except with laceration, while in most of these cases—with the exception possibly of the most extreme—the ring gradually gives like an elastic band over the advancing finger. If I have been right in the construction which I have ventured to put forward regarding the nature of this obstruction, then it is possible to conceive how we may have solely as the result of development any calibre of the pyloric orifice between that which we consider as normal and that which will admit only a small-sized—say No. 6—ordinary urethral catheter.

Before passing on to the more clinical aspect of the subject, I ought perhaps to indicate that these cases of pyloric obstruction in the adult in no way come under the category of that form of obstruction occasionally met with in earliest infancy. The so-called "congenital hypertrophic stenosis" of that period is of the nature of a very definite thickening of the pyloric region, and so quite distinct from the condition at present under discussion. While much has been written about this form of obstruction at the earliest period of life, very little appears to be mentioned of the particular kind specially referred to here. That this "hypertrophic" form may in some modified degree exist in the adult and be the cause of chronic gastric trouble I have very little doubt. Indeed, its existence has, I think, been fully established by Maier, whose cases I shall refer to later.

I should say, before proceeding further, that although ignorant of the fact when I first met with the condition that I have just described, subsequent investigation into the subject has brought to my notice the description of this same appearance of the parts by others. Landerer, quoted by Maier, seems to have been the first to draw attention to this simple narrowing of the pylorus unassociated with any marked thickening or other changes connected with the part. Maier discusses this same congenital abnormality, and also indicates very clearly other appearances equally of a congenital origin. Maier's cases numbered 21, and were necropsies upon patients who had died mostly from other causes than those connected with the gastric condition. In some a definite history of stomach trouble was known to exist during life. While Maier's paper deals essentially with the anatomical and pathological conditions, it is also intended to indicate the clinical symptoms which may be present during life, and to suggest that due regard be had to their possible significance in this particular connexion. For some years, therefore, the possibility of chronic gastric disturbance in the adult dependent upon an abnormal narrowing of the pylorus has been recognized; but it is only comparatively recently since surgery has attacked the stomach during life, that the cause and its effect have come to be more exactly noted and still further treated. The subject is briefly referred to by Mayo Robson and Moynihan in their work on *Diseases of the Stomach*, a very typical case illustrative of the condition being described. The patient was a male, aged 24 years, who had suffered from indigestion for five years, which had commenced gradually and painlessly. When operated upon, his symptoms were typically those of obstruction at the pylorus, and it was for this that he was treated. But the peculiarly simple and uniform nature of the obstruction, admitting only with difficulty the little finger, seems to have led the authors to regard this case as one of congenital narrowing of the pyloric orifice.

The simplest way, it seems to me, of considering the clinical aspect of the subject is to view the matter from the point of view of an obstruction at the pylorus; for the symptoms which arise from this must depend not only upon the calibre of this orifice—whether it is only slightly contracted or very markedly so—but upon the very build and constitution of the patient. Given the same amount of abnormal development of the pyloric valve in two persons, there may be the utmost difference as to the time of appearance of the earliest symptoms and their special character and severity. The stomach of a well-developed constitutionally healthy patient would probably overcome the obstruction and be free from symptoms to a much later period in life than one not so physically robust; and then, when symptoms did appear, in each case they might be totally distinct. I merely mention these matters in a general sort of way to show how extremely difficult must be the question of

Diagnosis.

In reviewing the cases I have briefly narrated there are not two that can be said to have presented symptoms of any

marked similarity either in the initial or the later stages of the disease. It is no doubt due to this variableness of the symptoms that has served to mask the true cause of them. As an illustration of this I may instance the first of my cases, that of Mrs. A. B. She was a patient of Dr. Alexander Shiels, of Glasgow, who asked me to see her with him in consultation. Her symptoms were solely those of chronic gastric catarrh from what cause it was not possible to ascertain. The amount of mucus discharged from the stomach was at times so large that it clogged the tube used for gastric lavage. Nothing but the very simplest and most meagre diet could the stomach stand. As seen at this time she was in a wretched state of health, and although in a position to have all that means could supply, no permanent improvement had ever been attained by treatment.

We discussed the case very fully and I must own to a sense of reluctance at the time either to propose or accede to operation. Would the performance of a gastro-jejunostomy give the stomach rest sufficient to enable it to recover from its chronically inflamed condition? Dr. Shiels seemed settled in his own mind that it was the right thing to do; his opinion being based on the success which he had seen follow operative treatment of a similar condition. Strange, therefore, as it may appear to some, the physician and not the surgeon was the one who advised operation. I accordingly performed a gastro-jejunostomy. Improvement was not immediate, but at the end of about six months progress, which had been slow, became rapid; and, without going further into details, this lady at the end of eighteen months was almost in what one might term robust health. The chronic catarrh in this case was evidently the result of many years of irritation, dependent upon the detention of food in the stomach by the narrowed pylorus.

The symptom of dilatation is a very variable one, sometimes present, sometimes not. What is usually found is that so long as the stomach is systematically washed out and only fluids and easily-digested substances taken no dilatation takes place; but any liberty in diet or relaxation in treatment, dilatation becomes manifest.

A sense of weight in the epigastrium is often a striking symptom after food, and in some instances no relief was obtained until the contents of the stomach was either artificially or naturally removed. In one case the patient said her food usually took about six hours to digest.

There is nothing really pathognomonic about these symptoms, but the most suggestive I would consider the following:

1. The existence of obstinate gastric symptoms during young adult life, not to be accounted for by any of the usually recognized causes, functional or organic. Often the patients are in a fairly good social position, where neither excess nor deficiency in the necessities of life exist; and often, too, the sufferer is one only of a family otherwise healthy in all its branches.

2. The patients are mostly women under the normal standard both in stature and build. It is only somewhat natural to suppose that this is likely to be so, because an amount of development of the fold, which in a viscus of naturally large size might not be sufficient to produce obstruction, would certainly do so in one of less dimensions. My cases were all women of comparatively small build, and, on account of the usually smaller stature of the female as compared with the male, we may reasonably suppose that the former are more likely to suffer from any undue narrowing of the pyloric orifice than the latter.

3. Another feature of diagnostic significance is, the great improvement it is always possible to effect by dieting, but the certainty with which any return to a normal state of living will call forth a renewal of the symptoms. This was most strikingly borne out in my cases.

Treatment.

As has just been stated, it is possible to greatly improve the patient by attention to all those means usually employed for the same symptoms arising from other causes. I think it must be that owing to the improvement it is thus possible to effect, many men have been led into the erroneous belief that a cure has been attained where really nothing more than temporary relief has resulted. Dissatisfied after a time in not being permanently cured, the patient seeks advice elsewhere, and so leaves his or her original attendant in the erroneous position of believing he has effected a cure. Certain it is that some of my patients had seen as many as half-a-dozen separate medical men; and, as I personally know, some of these

gentlemen have been indignant at hearing the patient has been operated upon for symptoms which they considered perfectly curable by the ordinary medicinal measures.

Operation is, of course, the only means of cure. It is not absolutely necessary in all cases, as a patient may, by careful attention to diet, doubtlessly live for years, and eventually die—as they did in some of Maier's recorded cases—of diseases quite unconnected with the stomach trouble. In nearly every case, however, it must be more or less an invalid existence.

Of the three operations which may be performed—pyloroplasty, pylorodiosis, and gastro-jejunostomy—I have little hesitation in saying that the last is the proper one to adopt. It was successfully employed in my 7 cases. Relief may be more or less immediate, but often it takes months to effect a cure. Where the stomach has been deranged for years careful treatment must be carried out for some time after the operation. So important and so frequently executed in this operation, that I should like just to add a few remarks with regard to it. What is frequently and quite properly asked is—"You may perform your operation quite successfully and relieve the symptoms, but what about the new relationships established? Are they of themselves ever likely to cause trouble?" I say that it is quite a proper question to ask because, unless we can honestly feel that the artificial and unnatural connexions we are establishing can, of themselves, in no way interfere with the future welfare of our patients, we ought probably to limit our practice to cases of necessity and not employ it where the question is one merely of expediency. It would take far too much time to discuss the many points in connexion with the performance of this operation; but after trying many methods and variations in detail, all aimed at procuring the most perfect, immediate and remote ends, I regard the following as the best. It is based solely on the attempt to leave the parts after operation as much as possible in their normal anatomical relation.

An oblique incision is made through the skin commencing about 1 in. below the right costal margin and 1 in. to the right of the middle line, and extending for from 3 to 4 in. across the middle line downwards and outwards at a distance of about 1 in. from the left costal margin (see Fig. 2). By this incision the right rectus is divided for about

Fig. 2.—Position of the parts after the performance of posterior gastro-jejunostomy. a, Skin incision. b, Orifice of bimuscular fistula, with union of gut above to under surface of stomach.

$\frac{1}{2}$ in. and the left for 2 in. or 3 in. The pylorus is exposed and an easy examination of the stomach afforded. The division of the rectus muscle I consider of no importance. What, however, I do think necessary towards the attainment of a perfect cicatrix is the union of the anterior and posterior layers of the rectus sheath by separate lines of suture. I have not failed once in obtaining a perfectly sound and non-giving cicatrix by this method.

The posterior operation by simple suture is the one, with few exceptions, practised. After withdrawing and turning upwards the stomach and transverse colon, the mesocolon is teased through and its edges secured by three or four stitches to the posterior wall of the stomach, which is made to present. The jejunum is picked up, closed to the duodeno-jejunal bend, applied to the stomach, and stitched to it for about 3 in., the direction being such that when the stomach is replaced it and the united bowel still occupy much the same relation as before union (Fig. 2). The opening of communication about $\frac{1}{2}$ in. long is made close to the great curvature, so that it comes to occupy the most dependent part of the viscus, and has also an inch or two of stitched surfaces above it. Thus it will be seen that no "angulation" of the gut is possible; there is no long loop of proximal bowel to become

"waterlogged," and possibly cause trouble in the remote future; there is no need for an entero-enterostomy; and as the bile and pancreatic juices very soon mix with the gastric juice, there is little fear of the formation of peptic ulcers in the distal limb. The ejection of bile into the stomach never takes place, because the method of attachment adopted causes it and the pancreatic juice to be shot past the opening into the more readily accessible channel below. The method, practised now for more than a year, has been followed by an entire absence of all untoward symptoms, and I believe ensures against any complications in the future.

In conclusion, let me sum up my remarks by saying:

1. That there exists a considerable class of patients in young adult life who owe their chronic gastric trouble to a congenital narrowness of the pyloric orifice.
2. That this "narrowness" is due in many cases to an undue development of the pyloric valve lessening the calibre of the orifice to anything between the normal of 12 to 15 mm., and 2 or 3 mm.
3. That the proper treatment is gastro-jejunostomy performed with due regard to the normal disposition of the parts after operation.

REFERENCE.

¹ *Virchow's Archiv*, Band cii, p. 413.

THE SUBSEQUENT HISTORY OF EIGHTEEN PATIENTS UPON WHOM GASTRIC OPERATIONS HAD BEEN PERFORMED.

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ONE of the most important points in connexion with the surgery of the stomach upon which definite information is lacking is the ultimate condition of cases in which it has been considered advisable to perform gastro-enterostomy or some similar operation. The immediate results are well known, and are excellent. What is wanted is the after-history—what happened later, after the patients returned to work and to their ordinary diet and mode of life; whether they were permanently relieved, or whether the improvement that immediately followed the operation may not have been only of a temporary character, due perhaps quite as much to the rest in bed, the quiet and good feeding, as to the operation itself. In the hope of obtaining some information upon this point, I asked Mr. Hugh Lett, the Surgical Registrar at the London Hospital, kindly to collect for me a few particulars with regard to all the cases upon which I had operated before the end of 1902, excluding cases of perforated ulcer (in which operation is compulsory, no matter what may be the ultimate result) and cases of carcinoma. The result, as usual in such inquiry, cannot be called satisfactory. Many of the patients could not be traced—a larger proportion, in fact, than is usual, because the majority of them were young women; but still I have been able to obtain a record of 18 altogether.

The questions asked were the same in all alike. Have you any pain after meals? If you have, is it severe? Are you often sick? Have you ever brought up blood since the operation? Is your general health better than it was?

The number of these cases is, of course, far too small to justify the formation of any general conclusions; but they illustrate a few points which appear to me to be worthy of attention. One of these is concerned with the hæmorrhage from what are often called erosive ulcers of the stomach, but which for reasons I have already given elsewhere I cannot help thinking would be better described as recurrent. There is no difficulty in arresting the bleeding. The base of the ulcer may be ligatured or it may be excised (in one or two instances in which there was a considerable number of bleeding points simple exposure to the air seemed to be sufficient); and in cases in which the amount of blood lost is becoming dangerous, such an operation may be, and in some of these cases I believe has been, the means of saving the patient's life; but it must always be borne in mind that the operation deals merely with one of the consequences of the ulceration, not with the cause, and that it cannot in any way prevent other ulcers forming subsequently, or bleeding taking place from them if they do form. And this no less true of gastro-enterostomy; I have known recurrent ulceration follow this operation in just the same way, in spite of the fact that the artificial communication was acting in a perfectly satisfactory manner. In two of my cases (Nos. 2 and 13) in each of