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 bimostric 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.

By C. MANSELL MOULLIN, M.D., Oxon., F.R.C.S.,

Senior Surgeon and Lecturer on Surgery, London Hospital; Examiner in Surgery, University of Cambridge.

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

No.	Name.	Sex and Age.	Date.	Condition, etc.	Remarks.
1	A. H.	F., 42	Nov., 1899	Numerous erosive ulcers on posterior wall, ligatured. Haematemesis for six years. Recently very severe	Free from pain. Has been sick twice since discharge, and on each occasion brought up small amount of blood. General condition much better.
2	A. A.	F., 34	March, 1900	One erosive ulcer on posterior wall, near lesser curvature, ligatured. Haematemesis eight times in five days. Very anaemic	No pain, bleeding, or sickness since operation. General state about same.
3	J. C.	M., 42	May, 1900	Chronic ulcer $\frac{1}{2}$ in. in diameter near cardiac end of lesser curve. Ligatured en masse. Haematemesis, pain, and vomiting five years; recently much more severe	No pain or haematemesis. Two attacks of vomiting since operation, each following exposure to wet and great cold. General health much better.
4	J. M.	M., 50	June, 1900	Tight annular stricture at pylorus, with dilated stomach. Pain, vomiting, and haematemesis six years before. Pyloroplasty	No pain or sickness since. General health "first-rate."
5	G. S.	M., 19	March, 1901	Tight annular stricture at pylorus. Pain and vomiting for four years. Very ill-developed, only weighs 3 st. 8 lb. Pyloroplasty	No pain or vomiting. Has more than doubled weight.
6	E. B.	M., 23	April, 1901	Perigastric adhesions around pylorus. Pyloroplasty. Pain and vomiting off and on for seven years. Haematemesis once recently	Still has occasional attacks of pain at night time; no relation to food. Not often sick; never brings up food. No haematemesis. General condition good when not in pain.
7	G. B.	M., 19	June, 1901	Pain and vomiting after food. Gastrotomy. No cause found	Condition much the same. Apparently atonic dyspepsia.
8	A. G.]	M., 39	Sept., 1901	Pain and vomiting beginning three years before. Four attacks of haematemesis; last two very severe. Haemoglobin 48 per cent. Gastrotomy. Nothing found	Has had no pain, vomiting, or haematemesis since. General condition better, but still anaemic. Has improved his business position considerably.
9	H. A.	F., 20	April, 1902	History of haematemesis. Persistent vomiting, one small erosion ligatured	Relieved for some months; vomiting returned and continued. General condition excellent. Red blood corpuscles 4,800,000. Hysteria (?).
10	A. M.	F., 23	April, 1902	Pyloric obstruction due to swallowing corrosive acid. Gastro-enterostomy	Married since. In perfect health. Absolutely no digestive trouble.
11	E. A.	F., 29	May, 1902	Very severe pain for last two years. Perigastric abscess opened. Blood and pus vomited	No trouble of any kind. Never felt better.
12	S. P.	F., 26	May, 1902	Very severe pain for years. Haematemesis four months before, and also seven times in last five days. Chronic ulcer on lesser curvature excised	No pain or sickness since. General health much better.
13	C. A.	F., 30	May, 1902	Indigestion twelve years. Severe haematemesis many times in last few days. Seriously anaemic. One erosive ulcer found and ligatured	Occasional indigestion, but not severe. Never sick. Has never brought up any more blood. General health about the same.
14	H. S.	F., 54	June, 1902	Indigestion all her life. Haematemesis once. Pain extreme. Old ulcer on anterior wall near lesser curvature. Anterior gastro-jejunostomy	No pain or sickness since operation. General health very much better.
15	F. G.	F., 30	June, 1902	Haematemesis on many occasions in last three years. Severe pain after meals. Pylorus rather tight; no ulcer found. Mucous membrane deeply congested. Anterior gastro-jejunostomy	Haematemesis once since. Was in hospital at the end of 1902. Noted that there was nothing abnormal; she took food well, and there was no vomiting.
16	H. M.	F., 27	July, 1902	Very severe haematemesis two years ago and again recently. Collapsed. Chronic gastric ulcer on posterior surface ligatured en masse	No pain or vomiting since. General health very much better.
17	M. C.	F., 25	July, 1902	Haematemesis, vomiting and pain at intervals for last two years. Numerous erosive ulcers and also blackened patches found. Ulcers ligatured	Immediate recovery perfect, but since has suffered from attacks of haematemesis as frequently as before operation.
18	J. A. F.	M., 48	Sept., 1902	Epigastric pain and vomiting for 16 years. Many attacks of haematemesis. Very anaemic. Anterior gastro-jejunostomy. Chronic ulcer near pylorus	No pain. Never sick. General condition very much improved.

which only one of these erosive ulcers was found, no further trouble has followed; and as one of them is of nearly four years' duration, the patient may reasonably be considered to have been cured; but in several others, after an interval of apparently perfect recovery, the haematemesis occurred again. Whatever may be the exact pathological condition underlying this particular affection, it is most essential that patients who are suffering from it should be carefully distinguished from those in whom the ulceration is chronic and persistent. In the one case operation is only required when the bleeding is so profuse as to place life in danger; in the other haemorrhage is an indication that the ulcer is extending, either in depth or breadth or both, and therefore requires a different method of treatment from that which it has hitherto been receiving. As a rule, the two can be distinguished from each other without any difficulty by the fact that a patient, who is suffering from recurrent ulceration, is perfectly well and free from pain in the intervals between the formation of these erosions; while, though not altogether unknown, an interval of perfect ease, lasting for any length of time, is certainly exceptional in those who are suffering from chronic ulceration.

Another point is connected with the presence of adhesions. If these are left, whether gastro-enterostomy is performed, or the ulcer is excised or ligatured, the patient will always be liable to suffer more or less from pain after taking food, owing to the stomach in its movements dragging upon the parietal peritoneum which is so abundantly supplied with sensory nerves. It seems reasonable to think that this would be less liable to occur after gastro-jejunostomy than after excision of the ulcer. The artificial communication has no sphincter, and consequently the stomach can empty itself with greater speed and against less resistance; but I am unable to form an opinion as to the relative merits of these two methods in this respect from the present series of cases, as unfortunately all the early ones of gastro-enterostomy, these in which there had been sufficient time to judge, failed to answer my letters and cannot be traced.

Simple division of gastric adhesions in the majority of instances is of little or no use. They nearly always form again. The only way in which it is possible to avoid recurrence of pain arising from this cause with anything like certainty is to excise that portion of the stomach wall to which these adhesions are attached, and bring the cut edges together carefully by means of sutures. The sero-muscular coat alone is concerned, and there is no need to touch the mucous membrane or lay the stomach cavity open; but it is evident that such a proceeding can only be carried out thoroughly so long as the area to which the adhesions are attached is limited; and therefore it is imperative, if the patient is really to obtain relief, that exploration should be undertaken before a condition that is incurable has been reached.

In three of my cases no cause could be found that was sufficient to account for the symptoms. One of these (No. 9), I think there can be no doubt from the subsequent history of the patient, must be classed among what are called, for want of a better term, hysterical cases. The patient was relieved for a time, but has been in hospital on several occasions since. She nearly always gives a history of haematemesis while out of the hospital. In the hospital there has never been any bleeding, but there have been pain and vomiting, and the latter is of a very peculiar character, very small quantities of food being brought up at intervals of a few minutes, without any apparent effort or nausea, just as with animals when they are ruminating. Meanwhile the patient keeps in excellent condition, with rather a high colour; and a blood count gives 4,800,000 red corpuscles to the millimetre.

Of the other two, one was in all probability an instance of atonic dyspepsia with some dilatation of the stomach, and would most likely have derived relief if gastro-enterostomy had been performed. The other (No. 8) is very perplexing. The patient was a man 39 years of age, who had had four attacks of haematemesis with melaena in the last two years. The two last attacks, the second of which occurred about six months before admission, had been very severe. The stomach was opened by an incision parallel to the curvatures, but

nothing was found to account for the symptoms. He recovered rapidly from the operation, and since then (September, 1901) has been free from pain, is never sick, has never brought up any more blood, and though still anaemic (as he was before the operation) has been able to do his work and improve his position in his business as clerk of the works in a building firm. I fully expected in this case to find a chronic ulcer of the stomach, and there may have been one which I overlooked, or there may have been an ulcer in the duodenum just beyond the pylorus; but the result, whether there was or was not an ulcer, is equally difficult of explanation. The cessation of the symptoms after the operation (the pain for the six months previous, since the latest attack of haematemesis, had been very severe and continuous, though made worse by food) may have been simply a coincidence, but, if so, it must be admitted that it was a singularly happy one. The explanation which has been advanced to account for the undoubted fact that the haemorrhage from erosive ulcers not uncommonly ceases as soon as the stomach has been opened and the mucous membrane exposed to the air—namely, that the effect is due to the influence that such a proceeding must have upon the vasomotor nerves of the stomach—will hardly hold good here. The cessation of the pain cannot be accounted for in this way. With greater probability, it seems to me that improvement was due to the free division of the circular muscular fibres of the stomach near the pylorus which such an incision involves; for the opening made was free, sufficient to introduce a large vaginal speculum. This would ensure that that portion of the stomach at least was kept at rest for some considerable time, long enough, perhaps, to enable it to recover and regain the power of performing its functions in a normal manner.

FIVE CONSECUTIVE CASES OF PERFORATED GASTRIC ULCER TREATED BY EXCISION.

By SINCLAIR WHITE, M.Ch., F.R.C.S.,

Senior Surgeon, Sheffield Royal Infirmary; Lecturer on Surgery, University College, Sheffield.

Four of the five cases were young anaemic women, and the fifth was a delicate, tuberculous-looking man. All had suffered from symptoms of gastric ulcer for a year or upwards, and in each the evidences of perforation were unmistakable. In each case the rupture occurred in the anterior wall of the stomach, and the opening was in the centre of a patch of thickened, inelastic, and friable stomach tissue. In three instances the walls of the stomach immediately surrounding the perforation were at least $\frac{1}{2}$ in. in thickness. In all there was extensive fouling of the peritoneum, the stomach contents having in each case reached the pelvis. Although gas was found in the peritoneal space in every case, in three only was the normal hepatic percussion note absent.

CASE I.—E. B., a woman, aged 24 years, operated on in the Sheffield Royal Infirmary on May 5th, 1902, ten hours after perforation had taken place. Appeared to progress favourably for three weeks, then began to have rigors, irregular pyrexia and sweating attacks. Died at the end of six weeks from multiple hepatic abscess secondary to a small collection of pus behind the stomach.

CASE II.—A. H., a girl, aged 18 years, operated on in the Sheffield Royal Infirmary on December 12th, 1902, twenty-eight hours after perforation. Made an excellent recovery.

CASE III.—F. D., a girl, aged 19 years, operated on in the Sheffield Royal Infirmary on January 6th, 1903, twenty hours after perforation. Made an excellent recovery.

CASE IV.—W. F., a man, aged 31 years, operated on in a surgical home on January 15th, 1903, thirteen hours after perforation. Appeared to do well for twelve days, then had repeated attacks of profuse haematemesis, from which he died on the fifteenth day. A few hours before death gastro-enterostomy was performed under cocaine anaesthesia.

CASE V.—H. E., a woman, aged 26 years, operated on in the Sheffield Royal Infirmary on May 22nd, 1903, seven hours after perforation. Made a slow but satisfactory recovery.

Excision of the ulcer was practised in each of these cases. The resulting wound in the stomach was closed by two rows of continuous sutures, an inner of fine catgut through the mucous membrane only, and an outer of silk through the musculo-peritoneal coats. The line of suture was strengthened by stitching over it a strip of adjacent omentum. Vigorous and prolonged flushing with warm salt solution followed, beginning in the spaces between the liver and diaphragm, and working down towards the pelvis. The period occupied in flushing varied from ten minutes to half an hour, and the entire peritoneal surface was systematically gone over at least twice. Towards the end of the process the shoulders of

the patient were raised so as to allow the fluid to gravitate into the pelvis. While the flushing was proceeding, an assistant, with the aid of pieces of gauze, detached flakes of lymph from the surfaces of the stomach and intestines, but in no case was anything like a complete removal of the lymph accomplished. The final flushing concerned the pelvis, and was kept up until all the stitches had been inserted. A glass drain tube was passed through a small suprapubic wound down into the pelvis, and retained for two or three days. Fluid collecting in the pelvis was aspirated through it every six hours. Severe shock existed at the end of the operation in every case, and was combated by hypodermic injections of strychnine, warmth to the skin, and rectal injections of hot water and brandy. The amount of strychnine exhibited varied with the gravity of the shock, but was always much in excess of the pharmacopoeial dose. Nothing whatever was permitted by mouth for the first four days. Every four hours half a pint of warm salt solution was slowly injected into the rectum, and half an hour later 4 oz. of a nutrient enema were administered.

The fact that two of the five cases died long after recovery from the immediate effects of the perforation and subsequent operation is disappointing, and is evidence of how formidable the sequelae to the condition may be.

In both cases the fatal result was the outcome of ulceration of the mucous membrane along the line of suture. In Case 1 quite 2 in. of the silk suture that had been used for joining the musculo-peritoneal coats was found hanging free in the stomach cavity.

Where the ulcer is easily accessible its excision, together with the surrounding indurated and thickened tissue, secures a far better closure of the perforation than merely bringing together the peritoneal surfaces, and with the use of the continuous suture takes up very little additional time.

Much discussion has taken place respecting the relative merits of flushing and mopping for cleansing the peritoneum in cases of perforated gastric ulcer, and experience has shown that success may follow either method. If the fouling is strictly limited to the immediate neighbourhood of the perforation mopping alone is sufficient; indeed, flushing in these cases might be injurious by disseminating the escaped stomach contents. In many cases, however, the contents of the stomach will be found to have spread over a large area of the peritoneum, and in these flushing, if not absolutely necessary, is at least expedient. Speaking generally, it may be said that flushing is required in cases where the perforation has taken place in a full stomach, and in those in which a long interval has elapsed between perforation and operation. On the other hand, mopping should suffice in cases operated on very soon after perforation, especially in those whose stomachs at the time of perforation were not distended. Many surgeons insist on the supreme importance of operating at the patient's home regardless of environment. They very properly contend that all movements of the patient after perforation has taken place tend to increase the area of peritoneal fouling. It would be foolish, however, to adopt this course in every case, as the houses of many of the poor are utterly unsuitable places for performing a laparotomy; and where this obtains it is better, I think, to remove the patient to a hospital, and to operate immediately on his arrival.

Various causes have contributed to the gratifying improvement in the recovery-rate after operation within recent years, but by far the most important of these has been the more widely-spread recognition that early diagnosis followed by immediate operation robs the catastrophe of most of its dangers to life.

A CANCER HOSPITAL IN MOSCOW.—A clinical hospital for cancer cases has recently been established in connexion with the University of Moscow. The buildings are said to have cost 400,000 roubles.

THE OLDEST AMERICAN UNIVERSITY.—Dr. Charles W. Dulles, a graduate of the University of Pennsylvania, claims to have established the fact that his Alma Mater is the oldest university in America. The University is not the oldest college, though it was established in 1740, but it was the first to take steps towards the enlargement of the curriculum by the addition of a separate department for graduate study, the school of medicine having been founded in 1765. This was the first actual realization of the university idea in the Colonies, but the idea of a university was in the minds of the founders as early as 1755, when the College of Philadelphia was given the power to grant "the usual university degree."