for the passage of food. In this case there was no tendency to "kinking," of the jejunum at the attached point, such as has been found in other cases, and there was no obstruction to the flow of the contents of the duodenum at the point attached to the stomach.

Another point is of interest as confirming what I have observed in numerous other cases of intra-abdominal suture, namely, that fine sterilised silk will lie in the coats of the bowel for an indefinite time without producing the slightest irritation. Mr. White's observation that the obstruction to the pylorus was rather from a valve-like action of the fold-like growth than from actual invasion of the sphincter, is of much interest, though, of course, with extension of the neoplasm the latter would soon almost certainly have been involved and directly blocked.

The avidity with which this patient took food and the completeness with which he digested it, as evidenced by the regularity and amount of his motions, is also interesting, and speaks well for the completeness of the functions of the new pylorus as contrasted with the old. It is only to be regretted that an intercurrent lung affection should have shortened his life and deprived us besides of the satisfaction of seeing the new condition of things leading on to its full fruition.

PERFORATION OF GASTRIC ULCER AND ITS TREATMENT BY ABDOMINAL SECTION AND SUTURE.

By R. M. SIMON, M.D., M.R.C.P.,

Physician to the General Hospital;

AND

GILBERT BARLING, B.S., F.R.C.S.,

Surgeon to the General Hospital, Birmingham.

WE have published elsewhere¹ a full account of a case of latent gastric ulcer which perforated, and for which abdominal section was performed, the patient dying the next day. The patient, a girl, aged 22, stooping to pick something off the floor, was seized with violent pain in the abdomen, collapse, and vomiting. Six hours later, in addition to these symptoms, there was rigidity of the abdominal muscles, tenderness on palpation, and some distension. There was nothing in the history to suggest gastric ulcer, so the abdomen was opened in the usual position below the umbilicus, and a careful search made for any inflammatory focus which might have burst and set up the severe peritonitis which obviously existed. None being found the wound was closed, and a drainage tube was placed in the pelvis. At the necropsy a perforated gastric ulcer was found on the anterior wall of the stomach about midway between the curvatures, and rather nearer to the cardiac than to the pyloric end. It was greatly to be regretted that nothing in the history of the case suggested the existence of the ulcer, as it was in a position where closure by suture might have been effected with some hope of a successful termination to the case.

Since the publication of this case the following has come under our care, and it seems of sufficient importance to place on record.

A girl, aged 20, was admitted to the General Hospital on Monday, October 12th, 1891, with a history of indigestion of some years' duration, and of a sudden severe pain in the left upper part of the abdomen, with moderate sickness on the Saturday. She did not feel very ill when she came to the hospital, had no fever, and was not sick, but she was admitted because she had had this acute attack of pain two days before, and said that three years previously she had been under treatment for gastric ulcer, although there had never been any hæmatemesis. She was ordered a mixture of bismuth and morphine, and passed a comfortable night. When seen on the following morning (the 13th) she was found to be rather collapsed, eyes somewhat sunken, and pulse 126, feeble and compressible. The abdomen was slightly distended, tympanitic, and very tender on palpation, especially in the epigastrium and the right hypochondrium; the abdominal muscles were tense, and the patient resented examination; there was no sickness, and though appetite was lost there was no complaint of pain after drinking milk and water, to which the diet was restricted.

With the view of relieving the distension 15-minim doses of ol. terebinth. were ordered to be given every four hours. About 3 A.M. that night she complained greatly of pain, began to vomit a green bilious fluid, and became much more collapsed. When seen in the morning it was evident that her condition was critical; the pulse was 150 and wiry, the eyes were sunken, and the face very anxious. The abdomen was more distended than be-

fore, and very tender. Whatever the cause, it was recognised that she was suffering from peritonitis. It seemed, after consultation, to be reasonable to associate her condition with the sudden onset of the pain four days earlier, and, to be imperative, if relief were to be obtained, to investigate its cause by abdominal section.

Operation.—The presence of a gastric ulcer which had perforated being strongly suspected, the abdomen was opened by an incision in the middle line above the umbilicus, and this was eventually extended to within an inch and a-half of the ensiform cartilage. The incision revealed slight peritonitis of the parts first exposed, namely, the lower margin of the stomach and the upper margin of the transverse colon, and enlargement of the wound upwards discovered a collection of semi-purulent fluid between the right lobe of the liver and the stomach. This being cleaned away, a finger was passed over the anterior surface of the stomach, and a perforation with indurated margins was felt about the middle of the organ, from which a quantity of watery fluid escaped. Several ounces having been withdrawn from the stomach by a piece of tubing, with the utmost difficulty the organ was drawn down so that the perforation could be seen. It was found to be circular and about $\frac{3}{4}$ inch in diameter. Five points of silk suture on Lembert's method were inserted, the tissues of the stomach wall bearing the strain on them well; but the position of the perforation entirely within the abdomen, in close proximity to the under surface of the liver, and the considerable distension of the abdomen, made the suturing extremely difficult. The abdominal cavity was now flushed with hot water and a Keith's tube placed between the liver and stomach, where the most advanced inflammatory mischief had been found. Nutrient was ordered *per rectum* only, the lips being simply moistened with water occasionally. There was a good deal of collapse by the time the operation was ended, and though for some hours there was an attempt at improvement, the symptoms of an advancing peritonitis prevailed, and the patient died thirty hours after the operation.

At the necropsy well-marked peritonitis was found, especially in and around the portal fissure, and about a pint of thin purulent fluid escaped from the cavity of the abdomen and pelvis. The perforation on the anterior surface of the stomach, about midway between the extremities and somewhat nearer the lesser than the greater curvature, was effectively closed by the sutures, and adhesions existed between the opposed peritoneal margins. A second ulcer was found on the posterior wall of the stomach, opposite to the one sutured; this was nearly perforating.

In commenting upon the two cases, though both of them ended in death, we still do not hesitate to urge the necessity for operation for perforated gastric ulcer. If left without operation, death in from one to two days follows in a large majority of cases; of the minority, nearly all die in a few days or weeks from mischief extending into the abdomen or thorax, or from a secondary perforation. Relief by operation has hitherto been rarely attempted; but once the possibility of this has been realised by the physician and surgeon alike, and operation is resorted to early after the perforation has occurred, it appears to us that success in a proportion of cases ought to follow.

From the literature of gastric ulcer, it is difficult to determine accurately the commonest position of ulcers which perforate. Although a very large proportion of ulcers is situated on the posterior wall of the stomach, yet actual perforation of these is quite frequently prevented by the presence of adhesion to adjacent organs, especially the left lobe of the liver and the pancreas; whilst ulcers on the anterior walls of the stomach, though relatively few in number, have a much greater tendency to perforate, owing to the absence of adhesions. This question of the position of the perforation is, however, for our purpose, not a matter of great importance, as in any case abdominal section is called for. If, when this is performed, the leaking point cannot be discovered, or from its position cannot be closed by suture, the evacuation of the escaped contents of the stomach should be effected, and, after flushing, a drainage tube inserted, and by prolonged rest of the stomach time gained for adhesions to close the perforation. If, on the contrary, the perforation is in an accessible situation, it should be carefully sutured, though the patience and dexterity of the surgeon may be taxed considerably to effect this.

The presence of a considerable quantity of fluid in the lower part of the abdomen and the pelvis in our second case, suggests the wisdom, when a widely spread peritonitis exists, of making an opening just above the pubes for the sake of draining there as well as at the site of the operation.

Cases of perforation naturally range themselves into two classes, each of which is typified in our two patients. In the one there is the immediate severe collapse, with severe pain, vomiting, and the onset of a rapidly spreading severe peritonitis, these conditions being due to a free escape of stomach contents, often induced by some exertion on the part of the patient. In these cases, given a previous history of gastric ulcer, the diagnosis is not obscure, and the indications for operation are clear. In the other class, of which our second case is an example, there is more difficulty in making a dia-

¹ Birmingham Medical Review, August, 1891.

gnosis of perforation. Here we have pain, sickness and faintness, with slowly extending tenderness and distension, but all these conditions are much less marked in the early stage than they are in the first group, though they may at the end of two or three days develop rapidly, and end the patient's life in a few hours. Here there is a smaller leakage which becomes more or less encysted by adhesions, and which may eventually form a well-defined abscess, perforating into the intestine, or on to the surface of the abdomen, or into the thorax²; or some accidental exertion, such as that of vomiting, may rupture the collection into the general peritoneal cavity, and set up a rapidly fatal diffuse peritonitis. In this second group, ill-marked as the symptoms are as compared with those in group one, yet with a history of symptoms of gastric ulcer they would generally call for an exploratory incision.

NOTES OF A CASE OF GASTRO-ENTEROSTOMY FOR PYLORIC TUMOUR, WITH GRADUAL DISAPPEARANCE OF THE TUMOUR AFTER OPERATION.¹

By J. CRAWFORD RENTON, M.D., F.F.P.S.G.,

Assistant to the Professor of Clinical Surgery in the University of Glasgow;
Assistant-Surgeon Western Infirmary, Glasgow; Additional Examiner
in Clinical Surgery in the University of Edinburgh.

A. H., age 38, was placed under my care by Dr. Crawford, with a history that she had suffered for some months from vomiting at intervals, great emaciation, constipation, and that he had detected a small tumour in the abdomen.

Since March she had been unable to take solid food without suffering from vomiting, which occurred from time to time, and she frequently noticed that she vomited at night what she had eaten in the morning. When taking milk alone she was able to prevent the vomiting for some days, but was more comfortable when she took no food of any kind. A distinct tumour was felt below the normal site of the pylorus. The stomach showed increased area of percussion, and well-marked splashing was made out.

I advised that the abdomen should be opened, the tumour examined, and removed if possible, and that the stomach should be united to the jejunum in order that the obstruction might be relieved. She was admitted to the Blythswood Nursing Institution in Glasgow on November 14th, 1891. She was fed for two days on small quantities of milk and barley water along with meat suppositories, which latter agreed with her. As she was very weak, I did not wash out her stomach previous to operation.

November 16th. Ether was given by Dr. Garnet Wilson, and assisted by Drs. Beaton and Bryce—there being also present Drs. Crawford and Sloan—I opened the abdomen, making an incision slightly to the left of the umbilicus. The stomach was found dilated, and the tumour was easily lifted upwards; it was the size of an orange, but slightly more flattened, and was quite free from adhesions, but had the look of a malignant growth.

As the patient was very feeble it was decided not to interfere with the tumour, so I made an incision $\frac{1}{2}$ inch in length at the pyloric and inferior aspect of the stomach, and, passing my finger in, I examined the constriction, and found, as we expected, that it was not due to contraction after ulceration, but caused by thickening at the pyloric orifice, which would barely admit my little finger. Loret's operation of dilatation could not, therefore, be practised, so I proceeded to join the stomach to the jejunum, making use of Senn's decalcified bone plates. Having first washed out the stomach, the wound was enlarged to $1\frac{1}{2}$ inch, and a bone plate threaded with chromicised catgut ligatures, as advised by Mr. Jessett, introduced. The ligatures, four in number, were passed, two through the coats of the stomach laterally, the other two were brought out at the upper and lower angles of the wound. A portion of jejunum was then selected which could be brought easily in contact with the stomach; the bowel was emptied of its contents, two of Makin's clamps applied with $\frac{3}{4}$ inches of bowel between them; the bowel was opened by an incision $1\frac{1}{2}$ inch in length, and a bone plate introduced and fastened as above described. The two openings were now brought in contact and the ligatures tied, a Lembert stitch being used at each end to steady the plates; the stomach and bowel were then dropped into the abdomen and the incision closed with Barker's silk. The usual dressings having been applied, the patient was lifted back to bed.

She made a perfectly good recovery, and in three weeks after the operation was taking solid food, and now—eight months after—she is looking healthy and well nourished. She is doing the usual work of a house, and recently has had extra strain owing to illness in her family, but she says she feels perfectly well and has no discomfort anywhere, and has never vomited since the operation was performed. On examination it is not now possible to make out any tumour—which may partly be due to the fact that she is so much fatter.

As gastro-enterostomy is a comparatively recent operation, I thought it might be an advantage to record this case.

Joining the stomach to bowel is evidently the natural operation to do, as Professor Gairdner drew my attention to a plate in an old pathological atlas which shows distinctly the union of the stomach and bowel in a case of ulceration with obstruction.

It may seem almost a matter for regret that the tumour was not removed, but doing so adds greatly to the risk, as there are then four wounds to heal instead of two, and the length of the operation is greater. I felt that the patient whose case I have detailed was so weak that removing the tumour would have been fatal, and I knew that if she recovered from the minor operation and the tumour gave trouble, I could reopen the abdomen and remove it.

The operation has given the tumour rest, and if it is malignant it is quiescent; if it is a fibrous enlargement it has subsided. Fibroid growths at the pylorus are not quite so uncommon as used to be supposed, and a careful examination of the abdomen should be made in all cases of indigestion, more especially when there is vomiting. The method of joining the stomach and intestine by Senn's plates is quicker than stitching the openings together, and is quite as satisfactory. Two preparations, which my friends Professor Chiene, of Edinburgh, and Dr. Beatson, of Glasgow, have kindly lent me, both show complete union of the stomach and intestine in cases of gastro-enterostomy operated on by them, the one by Professor Chiene having been united by stitching, that by Dr. Beatson by Senn's plates. The use of india-rubber rings has also been advised, and in cases where intestine has to be joined to intestine Mr. Jessett, to whom we are greatly indebted for our knowledge of intestinal surgery, has used these rings with perfect success. As the rings are not absorbed, he points out the importance of not using them in cases of stricture, as they might cause trouble by not passing.

The after-treatment of patients who have had this operation performed is most important; feeding by the mouth in small quantity should be commenced two hours after the operation, aided by meat suppositories, the quantity being gradually increased as the patient's strength returns.

The points of importance to consider are: 1. Is the operation one to be advised, and when should it be performed? 2. Should the tumour have been removed? 3. Are Senn's plates the best means of effecting union between the stomach and bowel?

CASE OF PERFORATING GASTRIC ULCER: PERITONITIS: RECOVERY.

By W. WINSLOW HALL, M.B., M.R.C.S., C.M.,
Surgeon to St. Monica's Hospital for Children.

CASES of recovery after peritonitis, due to perforating gastric ulcer, seem to be rare. I have been able to find records of only six cases. Three of these¹ are recorded as having completely recovered, while three² died in the course of subsequent attacks, and the accuracy of the original diagnosis was verified by *post-mortem* examination. In the following case recovery has, happily, been so far complete; and clinical facts alone can be offered in justification of the diagnosis:—

On February 1st, 1891, while I was doing duty for my friend, Dr. Waterhouse, one of his patients called me to see her nursemaid, who had become suddenly very ill. On my arrival I found a well-built young woman reclining on an elbow-chair, and apparently in a dying condition. I learned that, five years previously, patient had had hæmatemesis; that she then was treated for gastric ulcer as an in-patient at St. Mary's Hospital; that she had come out sooner than her friends expected; that she had had stomach troubles ever since, with occasional exacerbations of pain at a fixed point in the epigastrium. Of late, but for the epigastric pain, she had been unusually well. She had had a normal menstrual period a fortnight previously. On the morning in question she had breakfasted at 9 A.M.; she had passed water naturally at 11.30 A.M.; all the morning she had been unusually busy. Finally, at 1.15 P.M., while at house-work, she had been seized with sudden acute pain in the epigastrium accompanied by faintness and paleness, but no retching.

At 2.40 P.M., when I first saw her, the patient was of a ghastly pallor; the radial pulse was about 60, but almost imperceptible; temperature

¹ See an interesting paper by Taylor, *Birmingham Medical Review*, April, 1883.

² Read in the Surgical Section at the British Medical Association meeting at Bournemouth.

¹ Redwood, *Lancet*, vol. i, 1870, p. 647; Ross, *ibid.*, vol. i, 1871, p. 81; Tinley, *ibid.*, vol. i, 1871, p. 533.

² Fraser (2 cases), *Ranking's Abstract*, vol. i, 1861, p. 95; Hughes, quoted in Hilton Fagge, vol. ii, p. 472.