three occasions; a slight trace of free HCl was found on the first occasion only; lactic acid was always present. On examining the abdomen a large actively contracting stomach was seen: the greater curvature was 2 in. below the umbilicus. A small tumour was felt beneath the right rectus muscle. It was slightly movable, not tender, hard and rounded. The abdomen was opened on July 23rd, 1901. There was a very large stomach, which showed a slight though decided hypertrophy of its walls. There was a tumour at the pylorus about equal in size to a tangerine orange; extending from this along both curvatures, but more especially along the lesser, were hard cord-like masses of growth. There were enlarged glands along both curvatures. The growth was adherent behind to the pancreas, and in order to free it here a small portion of the head of the pancreas had to be removed.

The operation of removal of all the stomach except the "isolated area," and of the first portion of the duodenum, was carried out in the following way: A preliminary double ligature was applied to the chief vessels of supply. The coronary artery was exposed first, as it lay in the "ligament of Huschke"—the *falx coronaria*. The exposure was rendered easy by dragging the stomach downwards and to the left. The artery was then seen in a ridge of the peritoneum, which was thus upraised. The artery and vein were ligatured in two places and divided between (the vessel should be divided at a point beyond the origin of the oesophageal branches). The hepatic artery was then exposed a little above the pylorus by dragging the pylorus downwards; the pyloric and gastro-duodenal arteries, branches of the hepatic, were then ligatured and divided. The left gastro-epiploic vessels, along the greater curvature of the stomach, were similarly ligatured and divided at the junction of the "isolated area" with the body of the stomach, at a point which is near the hilum of the spleen. The lesser and greater omenta were then separated from the stomach at such a distance that the enlarged glands which they contained were left with the stomach. The middle colic artery, which is apt to be wounded in dividing the great omentum, was exposed and carefully protected. The stomach was then clamped by two pairs of Doyen's large clamps at the margin of the "isolated area" and divided between. Two smaller clamps were applied at the end of the first portion of the duodenum, and the gut was divided between. The stomach, with the involved glands and a part of the pancreas, were now removed (Fig. 2).

Fig. 2.—Showing the growth at the pylorus, the extensions along the curvatures, and the lines of incision in the stomach and duodenum.

The operation was completed by closing the cut ends of the stomach and duodenum, and by making an anastomosis between the posterior surface of the "isolated area" and a loop of jejunum pulled up through the transverse mesocolon. An end-to-end approximation was quite impossible. The operation lasted sixty-five minutes, and was attended by slight shock. No secondary nodules could be seen in the liver or elsewhere. After the operation the patient rallied well. His convalescence was uneventful, save for the fact that the abdominal wound did not heal by first intention; this was due to the fact that the Pagenstecher thread which I had used for the deep suture became septic, and caused a small abscess at the upper end of the wound. Within a fortnight the patient was taking ordinary diet, and was daily gaining health and strength. In March, 1902, the patient was shown at a meeting of the Leeds and West Riding Medico-Chirurgical Society. He was then 2st. heavier than when the operation was done, and was able to take ordinary food in full quantity.

On May 22nd, 1902, he called to see his medical man,

Dr. J. H. Waddington, who found there was a growth in the liver, and that there were signs of pleuritic effusion. The patient said he had "caught cold" a few days before, up to that time he had been quite well.

Dr. Waddington wrote:—

He walked to my house, a distance of 20 yards, and arrived suffering from great dyspnoea. On stripping him I found that the area over the posterior parts of the lungs were quite dull, up to the scapula on the right side and a little lower on the left. The apex beat was not displaced, but was diffused. I suspected fluid. On puncture I removed a few ounces, where I expected pints, I felt the lung touch the cannula. The dullness pointed either to much fluid or to solid lung. There was no bronchial breathing; no oegophony; vocal fremitus could be felt. The sputum, which was scanty, was not coloured, simply slightly frothy.

Dr. Waddington considered that there were secondary growths in the lungs, and I have no doubt that this opinion was correct.

The patient died on May 31st, 1902, 312 days after the operation. The cause of death was secondary deposit of growth in the liver and lungs.

This case, though the ultimate result of it was disappointing, is, notwithstanding, of great importance as showing that the operation which I adopted sufficed to relieve the patient of all the local growth, and was satisfactory in so far that it was not followed by any recurrence in the stomach or duodenum. The growths in the lungs and liver were doubtless present at the time of operation, but were of so small a size as to be unrecognizable. It is clear, therefore, that even in a most unfavourable case—for in this instance the involvement of the pancreas was a serious feature—the operation fulfilled all the requirements which were necessary to ensure complete local eradication. Further than this no operation for malignant disease can possibly go.

CASE OF CHRONIC PANCREATITIS, WITH AN ACCOUNT OF THE POST-MORTEM EXAMINATION.

By GILBERT BARLING, M.B., F.R.C.S.,
Surgeon to the Birmingham General Hospital.

IN the BRITISH MEDICAL JOURNAL for December 22nd, 1900,¹ I published an account of a case the subsequent history of which is of such interest as to appear well worth recording.

History.—Briefly, the early history of the patient was one of epigastric and right hypochondriac pain, going through to the back, of shivering, vomiting, and jaundice; in fact, his appearance to be a typical case of gall-stone colic. Operation in 1897 failed to find gall stones, but discovered a firm, somewhat lobulated mass in the region of the head of the pancreas, which it was feared would prove to be a malignant growth. A good recovery followed the operation, and, on the whole, the patient thought he was better after than before. Subsequently his attacks of pain, etc., returned as badly as ever, but by lapse of time it was clear that they were not due to malignant growth in the head of the pancreas, and the condition felt there was regarded as one of chronic inflammation. In January, 1901, nearly four years after the operation, the patient again came under my care in hospital with the same train of symptoms as before, namely, pain in the epigastrium and right hypochondrium, shivering fits, vomiting, and jaundice. He was considerably wasted, and was unable to follow his occupation of clerk owing to his feebleness and the frequency of his attacks. On January 4th, 1901, his abdomen was opened for the second time, and the gall bladder emptied of stinking bile and pus, and of two gall stones the size of small peas. From this fluid a luxuriant growth of colon bacillus and a few cocci was obtained. The head of the pancreas was still enlarged, and was very tough and leather-like to the feel. The gall bladder was drained in the usual way, and in the hope that it and the pancreas might be restored to something like a healthy condition the drainage tube was retained for ten months, and so long as there was free escape for the bile the patient was comfortable and free from symptoms. Soon after the tube was removed the opening almost closed and the old train of symptoms began to return. When the fistula reopened and discharged bile freely the patient was much relieved, but as the orifice narrowed so the pain, shivering, and jaundice recurred. On May 30th, 1902, the patient was readmitted to hospital, my intention being to anastomose the gall bladder to some part of the intestinal tract to enable the biliary fistula to close, and at the same time the bile to get round the obstruction caused by the pressure of the enlarged pancreas on the common bile duct.

Operation, June 4th, 1902.—With considerable difficulty the abdominal cavity was opened below the gall bladder. The matting of parts to the parietes and to each other was the most dense I have seen in this region, and it was with great difficulty that the walls of the colon and of the shrunken gall bladder could be found. The smallest-sized Murphy button was used to approximate the cavities, as suturing was inapplicable.

The operation was well borne, and such good progress was made that I hoped the patient would soon be about again, but on June 23rd three motions containing a large quantity of blood were passed, and two days later another large escape of blood occurred by the bowel, the patient dying soon afterwards. Calcium chloride was administered freely before and after the operation, but it will be seen later that the bleeding was not such as this drug could reasonably be expected to control.

Necropsy.—The necropsy made by Mr. Billington showed the following conditions: The lower part of the liver, gall bladder, and right half of transverse colon were firmly adherent to the anterior abdominal wall around the wound. The liver, stomach, colon, spleen, and duodenum were involved in a dense mass of old adhesions which bound them to one another and to adjacent parts of the abdominal parietes. From caecum to rectum the bowel was distended with blood; the Murphy button lay free in the descending colon. The gall bladder opened by a wide orifice into the transverse colon just to the left of the hepatic flexure, the junction was firm and did not leak. There was extensive sloughing ulceration of the lower part of the gall bladder and this ulcer was the source of the bleeding, though no obvious bleeding point was visible, the ulcer was just above the opening into the colon. The gall bladder was a fair size but surrounded completely by adhesions, the cystic duct, the hepatic duct, and the common bile duct were all dilated. There was no stricture anywhere and there were no gall stones present; the opening of the common duct into the duodenum admitted a No. 4 catheter. The pancreas was generally very hard and dense, presenting evidence of old chronic interstitial pancreatitis. Microscopic sections showed numerous thick bands of organizing fibrous tissue forming a coarse irregular network in the meshes of which were the pancreatic alveoli, the appearance closely resembling that seen in multilobular cirrhosis of the liver; in places the pancreatic cells had undergone degenerative changes and had been replaced by fibrous tissue. The liver showed extensive changes; there was a considerable increase of fibrous tissue around the vessels and ducts in Glisson's capsule and the liver cells showed considerable fatty and granular change, very few normal ones being left.

The history and the necropsy show clearly, I think, that chronic inflammatory changes in the pancreas were responsible for the patient's troubles. There was in the first instance marked enlargement of the organ, and at the necropsy the main bile ducts were much dilated; they were free from calculi and stricture, and the opening of the common duct into the duodenum was quite patent. The only condition found which might have caused obstruction to the flow of bile, and with it of course pancreatic juice, into the bowel was the chronic inflammation in the pancreas met with at the first operation in 1897 and recognized by the pathologist at the necropsy, when it is probable that the process of contraction of the inflammatory tissue had considerably advanced and reduced the size of the enlargement originally felt.

In the paper containing the early notes of this case with others, I pointed out that the treatment required for chronic pancreatitis will not always be the same. Prolonged drainage of the gall bladder will in some cases suffice, but in others, of which Case 4 in my original paper and the one now under consideration are examples, further measures are required. If at the first operation in the case now completed the gall bladder had been united to the intestinal tract, there would have been none of the difficulties experienced later in effecting the union, and probably the patient would have been relieved of his suffering and rendered capable of pursuing his occupation.

REFERENCE.

- ¹ Remarks on Chronic Enlargement of the Pancreas in association with or producing Attacks simulating Biliary Colic.

AN ANALYSIS OF 110 OPERATIONS FOR STRANGULATED HERNIA.

By WILLIAM THORBURN, F.R.C.S.,
Surgeon to the Manchester Royal Infirmary.

DURING my tenure of the appointment of Assistant Surgeon to the Manchester Royal Infirmary from 1889 to 1900 it fell to my lot to operate upon a very large proportion of the cases of strangulated hernia admitted to the hospital, and, as the experience thus gained is probably fairly representative of the conditions commonly met with in Lancashire, it has appeared to me worthy of record. For the collection of the very scanty notes of these cases I am much indebted to my recent house-surgeons, Messrs. Wharton and Lapage.

Within the years named the total number of cases in which I had to perform the operation of herniotomy is 110, and their

regional and sexual distribution is indicated in the following table:

			Males.	Females.	Total.
Inguinal	...	...	50	5	55
Femoral	...	...	3	34	37
Umbilical	...	...	4	13	17
Ventral	...	...	0	1	1
Total	...	...	57	53	110

The disproportion between the sexes in their susceptibility to strangulated inguinal and femoral hernia is here very marked, and is considerably greater than would be anticipated from the statistics of uncomplicated hernia. On the other hand the total number in each sex is almost equal, the male not showing the preponderant tendency to strangulation which might have been expected from the markedly greater frequency of hernia in this sex.

The case notes, which are often very defective, indicate the side which was affected in 53 cases of inguinal and femoral hernia. In 3 there was a double rupture, 2 being males with inguinal hernia on both sides, 1 (also a male) presenting a femoral on the right and an inguinal upon the left. In these 3 cases the right-sided rupture was alone strangulated. Of 48 remaining cases of single hernia with strangulation we have the following distribution: Right inguinal, 18; right femoral, 13; left inguinal, 12; left femoral, 7.

Strangulation thus appears to be more common on the right side in the proportion of 31 cases to 19, or about 3 to 2. Such a result was unexpected, and its explanation is not immediately obvious. To some extent it may perhaps be accounted for by the extra strain thrown upon the right side of the body, although it is difficult to appreciate how such strain could bear especially upon a right hernia. More probably the inequality is to be explained by the nature of the contents of the sac. Owing to its developmental position, and possibly to other causes, the omentum tends to enter a disproportionately large number of left herniae and the presence of omentum acts as a protection against strangulation by occupying the hernial canal with a yielding cushion, and thus allowing a greater amount of variation in the quantity of intestinal contents. Hence herniae of the left side may well be protected by their omentum from the danger of strangulation. The frequency of omental hernia upon the left side, and the tendency of strangulation to occur on the right are both well indicated in a table of Lockwood's: Of 79 strangulated inguinal and femoral herniae operated upon in St. Bartholomew's Hospital 49 were upon the right side, and of these 30 contained no omentum. On the other hand 30 were upon the left side, and 3 only were devoid of omentum.

The ages of the patients included in this analysis average 43.8 years, but considerable variations are naturally to be found in the case of different varieties of hernia. The 50 inguinal herniae of males include 8 children under 10 years of age, 6 cases only between the 10th and 30th year and 36 others extending up to the 84th year. The 5 females with inguinal hernia include 1 infant and 4 adults whose ages ranged from 37 to 54. The average age of all cases of strangulation in the inguinal region was 38.2 years. Femoral hernia, on the other hand, was found only in middle and late life, the extremes being 21 and 68 years while the average age was, for males 51.7 and for females 49.5. Among 17 strangulated umbilical herniae was 1 male infant of two days, the other cases ranging from 32 to 65 years of age and presenting an average of 50.3 years.

Strangulation being comparatively rare in infants and young children we may refer a little more fully to the exceptionally large number of examples here met with. One case of umbilical hernia was met with in a male infant aged 48 hours which was admitted with a very tense translucent sac about the size of a hen's egg: the sloughing stump of the umbilical cord was attached near the centre of the hernia: some meconium had been passed but there was constant vomiting. The infant was much exhausted and pressure would not replace the contents of the thin sac, which yielded no impulse on crying. The sac was entirely removed; its constricted neck divided, congested small intestine replaced in the abdomen and the operation wound closed by a single row of sutures: recovery was uninterrupted. Such a condition