management consists in supplying an aliment as little fermentable as possible; in preventing prolonged accumulation of food in the stomach; in promoting normal gastric activity; and in the administration of suitable antiseptics.

It is of first importance to ascertain whether the fermentative processes are mostly concerned with the albuminoid or with the carbohydrate constituents of the daily menu—whether, in short, the preceding type of indigestion has been of the sthenic or of the asthenic variety. The diet being arranged on a plan to meet the one or the other of these indications, ought to have, as an addition to luncheon, sour-milk cheese, which should be thickly spread on toast or biscuit and taken at the end of the meal. There are endless lactic acid preparations, but one of the best and most reliable is sold under the trade name of "Uga." It is supplied in small squares, one of which should be consumed in three or four days.

The next point of importance is to deal with the distension of the stomach from undue retention of the food which all fermentative cases present. There are two methods by which this fault can be overcome: either by the administration of emetics or by the practice of lavage. On the whole, it will perhaps be found that the best results are obtained by a combination of these plans. Despite its unpleasantness, there can be no doubt that the old-fashioned system of clearing the stomach by 15 grains of ipecacuanha, 30 grains of sulphate of zinc, or $\frac{1}{2}$ grain of apomorphine given hypodermically has much to commend it. The effect is not only to empty the stomach thoroughly, but also to stimulate its contractile power, and to counteract the tendency to pyloric spasm. When resorted to, the emetic should be administered first thing in the morning, and repeated every alternate day for three doses. If this does not succeed in affording relief and improving the tonicity of the stomach wall, it is then desirable to wash out the stomach every morning for a week or ten days with a mild alkaline solution, taking care that the lavage is carried out so effectually as to ensure the removal of every particle of fermenting food which the viscus contains.

As regards drugs, it is in this variety of indigestion that antiseptics find their greatest value; they may be given either in acid or in alkaline media, according to the requirements of the case. For acid mixtures pure carbolic acid in 2-grain doses, and for alkaline mixtures sulphocarbonate of soda in 15-grain doses, will be found extremely serviceable.

Examples of carbolic acid combinations have already been quoted in dealing with the later treatment of asthenic cases.

Constipation is the rule in these cases, and must always be corrected by simple aperients in combination with calomel. In cases that prove very rebellious it is often helpful to rest the stomach entirely for forty-eight hours. During this time of fasting the patient's nutrition can be satisfactorily maintained by nutritive enemata given every six hours. A suitable enema can be prepared in this way: The yolk of 1 egg, Carnrick's peptonoids 1 oz., glucose $\frac{1}{2}$ oz., chloride of sodium $\frac{1}{2}$ eggspoonful; peptonized milk to 6 oz.; to be made comfortably warm and slowly introduced into the bowel by a soft rubber tube and funnel.

The prescriptions which are here suggested must obviously be subject to modification according to the requirements of each case, and are to be accepted only as examples of drug combinations that have been, in my own experience, useful.

The complications which may attend indigestion have not been referred to; they are many, and require to be treated on general principles as they arise.

A VOLUME has been issued giving an account of the proceedings of the Association Médicale Internationale contre la Guerre since the date of its foundation up to its annual meeting last year. The body is one which was brought into existence mainly through the energies of Dr. J. Rivière during the Russo-Japanese war, and has for object the bringing to bear the influence of its medical adherents for the suppression of warfare. The next general meeting of the association is to be held in Paris in September. Information regarding it can be obtained from its President, Dr. J. Rivière, 25, Rue des Mathurins, Paris.

Remarks

ON

HOUR-GLASS CONTRACTION OF THE STOMACH.

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HOUR-GLASS contraction of the stomach is said to be a very rare disease, but it is probably not so rare as it is supposed to be, for I have operated upon six patients who were suffering from it during the last three years. The narrowing was due to the contraction of a simple ulcer in five, but carcinoma had been grafted upon simple ulcer in the sixth case. The condition would not have been recognized in at least three of these without the aid of the bismuth and x-ray method of examination. No operation would have been performed, and the patients, who are now living and well, would have died unrelieved with their condition unrecognized. Twice a diagnosis of late carcinoma had been made, and a hopeless prognosis had been given. The bismuth method undoubtedly affords the most reliable means of diagnosis of hour-glass contraction, and it ought to be used more frequently. Five of the patients were extremely ill at the time of operation, and had been invalids for many years. Earlier diagnosis and treatment would have saved them much pain and misery. It is even possible that malignant disease would have been prevented in the sixth case. All the patients fortunately recovered from the operation, and they are now in fair but not robust health. The patient with malignant disease, although greatly relieved, is of course only better for a time. Early operation not only lowers the mortality, but makes the restoration of health more complete. The mortality of recorded operations for hour-glass contraction is high, therefore the recovery of these patients, in spite of very grave conditions, is gratifying, and is chiefly due to recent improvements in technique, and in the treatment of patients before and after operation. In most cases gastro-gastrostomy is the most suitable operation, but in two of these patients pyloric stenosis had to be relieved at the same time. For this gastro-duodenostomy, after Finney's method, was easily done and was efficacious. On account of the interest of the condition, a detailed account of the six cases will now be given, and this will be followed by a short discussion of the pathology, diagnosis, and treatment of hour-glass contraction.

CASE I.

Mrs. M. D., an American lady aged 42, was brought to me by Dr. J. C. Cook towards the end of October, 1909.

History.

She gave a history of lifelong constipation and indigestion. About ten years ago she began to have attacks of biliary colic about once or twice a year, but these entirely ceased four years ago. She has never been jaundiced. Since she was a girl she has suffered a great deal from indigestion. For the last three years she has had almost constantly a dull pain in the epigastrium, but this has become a great deal worse within the last few months, and has lately shifted up the sternum as high as the sternal notch, where it is sometimes very severe, especially when the patient swallows. The indigestion has been very bad during the last eighteen months. At first she used to vomit about once or twice a week, but gradually this has increased in frequency to once every day, and lately after every meal containing any solid. She has never had hæmatemesis or noticed melaena. Gradually the amount that she can swallow at a time has diminished. After the food she has a feeling of a lump in the throat and under the breast-bone. For months she has not been able to take solid food in comfort. The attempt has always been followed by great pain, which is only relieved by the return of all the food. One day she took an oyster divided into four pieces; this was followed by great pain and vomiting, which was only relieved when the last piece of oyster was returned four hours later. The only solid that she could occasionally take in comfort was a Welsh rarebit. Occasionally her mouth fills with water, and then she brings up a small amount of mucus. The act of swallowing itself is not painful if the patient is content with a small amount of liquid at a meal. For the last year she has not been able to take tea. For months she has lived on peptonized milk, Benger's food, Brand's essence, and so on, in decreasing quantities at a time. These have been supplemented by nutrient enemata and suppositories. She has wasted progressively for two years, but much more

rapidly during the last six months. About two years ago her weight was 130 lb.; now she is only 56 lb., although she is 5 ft. 9 in. in height. During the last few months she has had several attacks of shivering, associated with exacerbation of vomiting. In spite of all this the patient has led an active life, often travelling 200 miles a day in her motor car and managing the business affairs of her daughter. She was taken to see a well known consulting physician in May, 1909, who is said to have diagnosed malignant disease in the abdomen, possibly in the stomach or pancreas. He gave a bad prognosis, and advised that the patient should be allowed to live and do as she liked.

Condition upon Examination.

The patient was extremely thin and feeble (Fig. 1). She was only able to walk into my consulting-room with difficulty.

Fig. 1.—Case 1: A month before operation. She was thinner at the operation. She weighed 56 lb.

She was not able to dress or undress herself. Her skin was yellow, dry, and wrinkled. The temperature was 97°. The hands and feet were cold. There was some oedema of the ankles.

Alimentary System.—All the natural teeth were missing, having been extracted about fifteen years ago and replaced by complete sets of artificial teeth. The tongue was raw and red. When asked to swallow a glass of milk she was only able to take half a tumblerful in small sips. Any attempt to take more gave rise to pain and a feeling of distension at the lower end of the sternum. The abdomen was carinated, and in spite

Fig. 2.—Case 1: Hour-glass contraction and pyloric stenosis. Bismuth shadows. Note unusually small size and high position of the cardiac shadow above and to the left of the umbilicus *o*. The pyloric shadow was partly behind the pubis, and took some time, and repeated swallowing of small amounts, to reach the size indicated.

of the fact that the abdominal wall was very thin, no tumour could be felt anywhere in the abdomen. There was a little resistance in the gall-bladder region, but no dullness or tumour. A succussion splash could be obtained a little below the level of the umbilicus. A pelvic examination revealed no abnormality. The respiratory system was normal, in spite of a history of possible phthisis at the lower part of the right upper lobe. The nervous system was normal except for great irritability of temper. In view of the difficulty of diagnosis between oesophageal stricture and hour-glass contraction of the stomach with pyloric obstruction, an *x*-ray and bismuth examination of the stomach was advised. Three days later the patient was asked to swallow a tumblerful of milk containing 1 oz. of the oxychloride of bismuth. After much coaxing she was only able to swallow half this amount. She was then placed standing before the *x*-ray apparatus. It was at once seen that the oesophagus was not distended, so that the obstruction could not be in it. A small shadow was seen just below the diaphragm, and from the right border of this a narrow streak of bismuth extended into a lower shadow, giving the characteristic appearance of hour-glass stomach, with an unusually small cardiac pouch (Fig. 2). As the patient swallowed more bismuth the lower shadow gradually increased until it was much larger than the upper one. It extended from 2 inches below the umbilicus to a little below the symphysis pubis. The fluid took a long time to run away from the upper sac, so that the obstruction was evidently severe.

The size of the pyloric pouch and the delay in the exit from the stomach made it clear that there must be pyloric obstruction as well. An operation was advised and the patient consented. The next day was spent in preparation. The patient was given nothing but sterilized milk and boiled water by the mouth and nutrient enemata and salines were also administered alternately every four hours. This improved the pulse and the general condition of the patient to a great extent. The false teeth were taken away and the mouth thoroughly cleansed several times a day with an antiseptic mouth wash.

Operation.

On the morning of the second day after the examination Dr. Page gave an anaesthetic, and the abdomen was opened

through an incision made as high as possible in the left rectus muscle, some of the fibres of which were cut across in order to give more room. The stomach was explored and the conditions suggested by the *x* rays were discovered. The upper pouch was very small, being about the size of an ordinary hen's egg. The lower pouch was fairly large, being about the size of a normal stomach. The pylorus was considerably narrowed, but fairly movable. The scar of a healed ulcer was seen upon its anterior surface. The constriction in the stomach was very hard and tight. There was not enough thickening of the wall to suggest carcinoma, nor were there any signs of any enlarged glands in the small or large omentum or pancreas. The stricture was 3 in. long and appeared to be due to the healing of a large saddle-shaped ulcer occupying the lesser curvature quite close to the oesophagus and extending far downwards upon both the anterior and posterior walls of the stomach. The lower part of the stomach was pulled downwards and to the right so as to bring the cardiac pouch into view. For reasons that will be presently discussed, a gastro-gastrostomy was decided upon. It was found to be impossible to control the cardiac pouch with clamps without passing one blade through the gastro-colic omentum into the lesser sac of the peritoneum and upwards behind the stomach towards the oesophagus. The other blade was placed in front of the stomach and the lesser omentum, and the forceps were locked and closed. Another long clamp was applied on the anterior wall of the pyloric pouch near the greater curvature, and with its points directed upwards and to the left. The clamped portions of the stomach were then carefully isolated with moist packs, and they were joined together by two layers of direct sutures, just as in gastro-jejunostomy. Linen thread was the suture material used. The opening in

Fig. 3.—Case 1: The cardiac and pyloric pouches were anastomosed, A, *a* and B, *b* being joined together respectively. The constricted pylorus *p* was greatly enlarged, after Finney's method. The incision along its lower border is shown extending into the duodenum and stomach. The edges were sewn together in such a way as to enlarge the pylorus without tension 1 to 2 and 3 to 4.

the cardiac pouch extended from the lower and right to der upwards, and to the left of and above the oesophageal orifice (Fig. 3). This was the only way to make it long enough. The wall was extremely thick and hard. The mucous membrane was inflamed and closely adherent to the other coats, so that none of it could be removed separately. Therefore an ellipse of the whole thickness of the fibrous wall was removed. It was impossible for the through-and-through suture to pick up the mucous membrane all the way round without unduly narrowing the anastomotic opening; but the other coats were so extremely fibroid that there did not appear to be any danger of the stitches cutting out. The external sero-muscular suture having been completed, tags of the lesser and gastro-colic omenta were fixed over the suture line. The pylorus was then brought into the wound, and an incision was made along its supple lower border and prolonged into the lower borders of the duodenum and stomach, which were close together. The wound was closed after Finney's method of gastro-duodenostomy, but with continued instead of interrupted sutures. Before the opening was made, clamps were applied to prevent leakage and haemorrhage. The gall bladder was found to be full of stones, but it was neither inflamed nor adherent, and the cystic duct was patent. There was no indication for removing the stones, especially as any prolongation of the operation would probably have resulted fatally. Moreover, the gall stones had given rise to no symptoms for five years. When the operation was completed the stomach seemed to be about the normal size and shape. The new pylorus was very wide. The gastro-gastrostomy had drawn the pyloric pouch upwards and to the left. The abdomen was closed in layers, the opera-

Fig. 4.—Case 1: Four months after the operation. She is now much fatter. She weighed 104 lb.

tion being completed in forty-five minutes. A saline enema was given immediately on the return of the patient to bed. The patient was rather collapsed for the first two days. She was given water to drink from the first, and saline and nutrient enemata were administered alternately every four hours. The mouth was exceedingly dry and thirst was very severe. Towards the end of the second day milk was given by the mouth, and from that time onwards nutrients were discontinued. The food given by the mouth was gradually increased so that at the end of fifteen days she was on minced full diet. Gradually the patient became able to swallow larger amounts at a time. She left the home after five weeks with her condition very much improved, having gained over a stone in weight (Fig. 4). She was last seen at the end of September, 1910. She was then very well and looked years younger. She weighed 7 st. 10 lb., having gained 3 st. 10 lb. since the operation about a year ago. She was said to be well at Christmas, 1910.

CASE II.

H. B., a married woman aged 40, was admitted into Guy's Hospital under my care on March 17th, 1909. She was sent to me by Dr. J. E. Hancock of Hurst Green, Sussex, for recurrent attacks of abdominal pain and vomiting. The following is the report of my ward clerk, Mr. Samuel: The patient had always been pretty strong and healthy as a young girl, but about twenty-two years ago, whilst in service in London, she was suddenly attacked with violent pains in the stomach accompanied by vomiting. She was attended by a doctor, who told her that she had an ulcerated stomach, and that this condition had been brought about by the dampness of the bed in which she had been sleeping. She was admitted to Hastings Hospital for her condition, and, after being detained there for a few weeks, she was discharged much better. Since then she has had repeated attacks, which vary in duration from days to months and the intervals between which vary from days to years. The patient has been married for fourteen years, and from about two years prior to that time she has been almost continually a victim to gastric troubles. About fifteen years ago she was in Charing Cross Hospital for the same trouble, and was treated there by means of rest and dieting for some weeks before being discharged much better. The pains, which are usually extremely acute, are situated in the pit of the stomach, and usually shoot into the right shoulder blade, and sometimes into both shoulder blades, but never into the left without the right being implicated, and when both shoulder blades are affected the right is always worse than the left. Occasionally the pain is in the shoulder blade but not in the stomach, and vice versa. During the attacks of pain there is usually much vomiting, and this, like the pain, is much worse after the patient has exerted herself in any way, and is sometimes worse after meals. Occasionally she brings up a little blood when vomiting. Lately she has vomited about three or four times a day without definite relation to food. During the attacks she is constipated, but she attributes this to the low diet which she usually follows when she is ill. In the intervals between the attacks of pain the bowels are always quite free, but certain foods such as cheese, meat, tea, etc., and violent forms of exertion, soon bring on the attacks again. The last attack began in November, 1908, and has lasted ever since. For the past month she has been practically living on nothing else but milk and arrowroot, but still she gets no relief. The pain has been very great, and the patient has begun to feel very weak. She sleeps very badly. Since November the patient has lost flesh, has had no appetite, and has felt very ill in herself.

Condition on Admission.

The patient is extremely thin and sallow. She is always cold, especially in her extremities, and she is very irritable in temper. The tongue is swollen and raw. The patient suffers very much from thirst.

Fig. 5.—Stomach area after inflation with CO₂—that is, dilated and dropped, but no sign of being bilocular. Possibly a second division might be at the fundus, but there was no delay in filling up of pyloric pouch.

"Examination after bismuth showed the bismuth retained in the upper part of the stomach (cardiac end) for several minutes. The bismuth gradually passed down to 3 in. below the umbilicus and collected there. Small streaks of bismuth could be seen passing between the two places, but the two were never actually united. There is active peristalsis of the cardiac

end. After air injection there was no definite shadow of any neoplasm, and the condition appears to be one of hour-glass contraction."

Dr. Hertz kindly examined the patient in various ways and reported as follows:

"Stomach area, after inflation with CO₂s, dilated and dropped, but shows no sign of being bilocular. (Fig. 5.) Possibly a second division might be at the fundus, but there was no delay in filling up the pyloric pouch. After a bismuth meal the food passed slowly through the narrow constriction into the pyloric pouch, which is dilated and low, as shown by the CO₂ inflation. (Fig. 6.) The examination was in the vertical position, when the cardiac pouch extended below the neck leading to the pyloric pouch. On washing the stomach out three and a half hours after the test meal, there was no food residue. A fair amount was found on a second occasion after one hour and twenty minutes. Hence there is no constriction sufficient to produce stasis of food. Of 5½ pints run in, 4 pints could be withdrawn. On the second occasion it appeared as if most food was in the lower division, as the water returned almost clean when the tube was introduced a short distance, but turbid and blood-stained when introduced any further.

Fig. 6.—Bismuth shadows. A, Cardiac pouch. B, Constriction. C, Pyloric pouch. D, Umbilicus.

Operation.

On April 1st, 1909, the patient was anaesthetized, and the abdomen was opened through the upper part of the left rectus muscle. The left costal margin was retracted. The stomach was examined and found to be hour-glass in shape, due to a very large saddle-shaped ulcer on the lesser curvature near the oesophageal orifice, and extending on to the anterior and posterior walls. Contraction of this ulcer had greatly narrowed the stomach at this point, the lower border being drawn up in a striking manner. The pyloric pouch was the larger, and was joined to a smaller cardiac pouch by a narrow constriction. The ulcer was extensively adherent to the under surface of the liver, which it had deeply eroded. The pylorus and duodenum were healthy. Gastro-gastrostomy was decided upon because the cardiac pouch was so fixed high up under the ribs as to make posterior gastro-jejunostomy very difficult. Gastroplasty was not chosen owing to the depth at which the sewing would have to be done. Moreover the incision would extend into the thick-walled ulcer, making the suturing difficult and risky. About 4 in. of the anterior wall of each gastric pouch near the greater curvature was clamped obliquely on each side of the constriction. The points of the strong clamps were directed upwards and to the left. After carefully packing with moist gauze, the clamped portions of stomach were joined together by means of two continuous silk sutures, one piercing all the walls and the other only the serous and muscular coats. Elliptical pieces of mucous membrane were removed. The opening was 3¼ in. long. A few more sero-muscular sutures were used at intervals round the anastomosis for greater security. After mopping with moist gauze, the packs were removed, and the abdomen was closed in layers, catgut being used for the peritoneum and the rectus sheath, and salmon-gut for the skin, superficial and deep fascia. The wound was then dressed aseptically. The operation lasted thirty-five minutes. Soon after the operation the patient was given water to drink, and a rectal saline was also administered. She vomited three times after the operation, bringing up a little brown fluid which contained blood. Otherwise her recovery was uninterrupted. The wound healed perfectly. The temperature was normal throughout. The diet was gradually increased. She rapidly put on weight, and left the hospital on April 20th, just three weeks after the operation. The food was minced, because the patient had no teeth. When she went home her food was also minced, and as far as possible the diet was restricted for the same reason. In spite of this she put on weight, and rapidly improved in general health. About six months later she was able to buy a set of artificial teeth, since when she has got on even more rapidly. She suffers no pain, and has not vomited. The bowels act regularly. About fifteen months after the operation there was some recurrence of indigestion. The patient was working very hard at the time. The symptoms abated under treatment, with avoidance of overwork. At Christmas, 1910, the patient was very well, and expecting a baby.

CASE III.

Mrs. A., aged 60, a patient of Dr. Colin King, Dr. Owen Lankester, and Dr. Hertz; a housekeeper. The patient had suffered from indigestion for many years, and had vomited about once every twenty-four hours for the last fifteen years. She had had a great deal of abdominal pain, especially in the epigastrium. This was considerably relieved by vomiting. The bowels had been constipated for years, and she had been in the habit of taking tabloids of cascara sagrada every other night. She never saw any blood in the vomit until about Christmas, 1909. There was no history of melaena. Gradually the attacks of sickness have become much worse and more frequent, and the patient has been unable to do her work since Christmas, 1910. At that time she brought up a large quantity

of black vomit which was proved to be blood by Dr. Colin King. She has not seen any blood since. She has had to limit her diet more and more, and to mince her food. She was able to take chicken finely minced a fortnight ago. The patient has lost all her teeth except two for many years, but she uses artificial ones. For about two months she has been in the habit of having the stomach washed out about once every third day without getting much relief. She has been sleeping badly and has wasted a great deal, but she has not weighed herself.

Examination.

On examining the stomach with the *x* rays an hour after bismuth oxychloride had been taken with bread and milk, a dark shadow was seen above the costal margin and about 3 in.

Fig. 7. — A Shows the shadow seen by Dr. Hertz one hour after taking bismuth oxychloride. B Indicates the appearance six hours later. Without the second examination after some hours a mistake in diagnosis would have been made. C Indicates the umbilicus.

Dorset House for this to be performed on Saturday, July 2nd, 1910.

During the four days that the patient was in the nursing home she was sick once or twice every night, bringing up a large quantity of sour fermented material. She could not sleep until vomiting had occurred in the early hours of the morning. She was able to take milk, fish, jelly, and beef-tea. The bowels were only opened once, in spite of several large doses of cascara sagrada and some white mixture. Saline enemata were given three times in twenty-four hours, and these were well retained. The stomach was washed out on the night of July 1st, and again before the operation on the morning of July 2nd, half a pint of water being left in. The patient was sick in the night, in spite of the washing out. Her general appearance improved a good deal; she became less shrivelled, and had less pain.

Operation.

At 9 a.m. on July 2nd, Dr. Shipway giving the anaesthetic, the abdomen was opened through the upper part of the left rectus. The constriction was at once seen, and it was found to be adherent to a band stretching from it to the round ligament.

Fig. 8.—Case III: Hour-glass contraction. U, Circular ulcer and stricture with suspensory adhesion extending to the abdominal wall. The A and B incisions into the cardiac and pyloric pouches start an inch below the stricture and run an inch in front of the curved lower and inner border of each pouch. This method allows very large openings to be made without either invading the ulcer above or trespassing on the gastro-colic omentum and its large vessels below. The ordinary short vertical incisions are less radical.

teriorly instead of one. The opening was $3\frac{1}{2}$ in. long. The stricture was extremely tight, the external circumference just beyond the ulcer being no thicker than an ordinary lead pencil, so that it was difficult to imagine anything getting through. Pagenstecher's thread was the suture material used. The abdomen was closed in layers in the usual way. The operation lasted three-quarters of an hour. The patient was not shocked when she was put back to bed. She was given $\frac{1}{2}$ grain of morphine and 1 pint saline enema. During the next twenty-four hours the patient vomited several times, bringing up small

quantities of brown material. The stomach was therefore washed out, and this immediately relieved the vomiting. Afterwards the patient made an uninterrupted recovery, and was last heard of in November, 1910, when she was quite well—in fact, better than she had been for over twenty years.

CASE IV.

E.B., aged 47, a married woman, having had eighteen children, thirteen of them dying before they were 1 year old. Five are now in excellent health. She has not yet reached the menopause. Apart from the present illness the patient has been remarkably healthy.

History.

The present illness started two years ago, a little before the birth of the last child. She then vomited frequently, and had severe abdominal pains. She had also been excessively constipated ever since, having to take large doses of castor oil at frequent intervals. These symptoms got gradually worse, and the patient states that at one time the bowels were not opened for six weeks and two days, and that she was only able to take slops during this period. She went to the Greenwich Hospital on February 19th, 1907, where she had her stomach washed out. She was referred to Guy's Hospital, but was too ill to come up until February 25th. The bowels were opened once during the interval. She states that she has lived mostly on milk and fish for the last two years, and that any attempt to take meat or other solid food made her vomit. For the last month she has vomited frequently every day after any kind of food. When she was admitted she was thin, sallow, and anaemic, and appeared to be in pain. Many of her teeth were missing and her breath was foul. On watching the patient the stomach became prominent above the umbilicus, and marked peristalsis could be seen. On February 27th the stomach was washed out, and a large amount of partly digested vegetable food came away. There were pieces of carrots, turnips, and cabbage, clearly proving that the patient's statement as to her diet was inaccurate. No meat was found. The food must have been taken before the patient's admission into hospital three days before. There was no free hydrochloric or lactic acid. The bowels opened several times after the washing out, but the vomiting continued to get gradually worse until March 7th, when she vomited frequently all night and during the following day. On March 8th, at 12 a.m., the patient complained of loss of power and stiffness in the legs and fingers. The fingers were fully extended and the patient was unable to flex them. Then suddenly, while the clinical clerk was watching her, the fingers became forcibly clenched, the elbows flexed, and all the muscles of the arm and forearm were firmly contracted and then slightly relaxed again to their fullest extent. Her legs also became suddenly extended to the full, being stretched out in bed with the balls of the big toes touching. The calf muscles were very hard and so were all the thigh muscles. The facial muscles contracted, distorting the face. The patient could not speak. After about half an hour the attack slowly passed off. Then the patient lay in bed quite exhausted. She said that the contractions had been very painful. She had similar attacks at 1 p.m., 5 p.m., and 8 p.m., the latter developing while the stomach was being washed out.

Operation.

An operation was decided upon and performed at 10 p.m. on March 8th. It was not thought wise to wait until the next day on account of the increasing severity of the tetanic attacks. When the abdomen was opened a large saddle-shaped ulcer was found 3 in. to the left of the pyloric ring. This was situated at the lesser curvature and extended to the anterior and posterior walls of the stomach, mostly the latter. The greater curvature had been drawn close up to the ulcer, thus making a very tight constriction and an hour-glass stomach, but there was no obstruction of the pylorus, so that the small pyloric pouch was not dilated. It was therefore decided to make an opening between the cardiac pouch and the jejunum. There was clearly no indication either for a plastic operation upon the stomach or for a double gastro-jejunostomy. A posterior gastro-jejunostomy without a loop and without inversion was made, the opening being at least 3 in. in length (Fig. 9). The patient was very bad under the anaesthetic and the operation had to be performed as rapidly as possible. The patient was back in bed within twenty-five minutes of leaving it. A saline rectal infusion was given shortly after the operation and the patient then developed her most severe attack of tetany, and it was feared that she was dying in it, but fortunately it passed away. She had one other slight attack at 6 p.m. the following day, twenty hours after the operation. From this time she made an uninterrupted recovery, gaining flesh rapidly. She left the hospital quite well about three weeks after the operation. An attempt to trace her in September, 1910, failed. She had left her former address, but when she was last heard of, about a year after the operation, she was quite well.

Fig. 9.—Case IV: Hour-glass contraction in the prepyloric region without pyloric stenosis. A single posterior gastro-jejunostomy proved entirely satisfactory. The patient was suffering from severe tetany.

CASE V.—Hour-glass Contraction and Pyloric Stenosis.
Miss N., aged 40, sent by Dr. Wynne of Northiam, was admitted into Guy's Hospital on June 9th, 1910, for gastric symptoms which were very suspicious of hour-glass contraction of the stomach. The following is the report of the ward clerk, Mr. Price Harris

History.

The patient first noticed symptoms fifteen years ago. These were acute attacks of indigestion followed by vomiting. These attacks lasted from a week to a month, there being some very acute stages when the patient had to lie down for some hours to get relief. On careful dieting with milk the patient was then able to keep off another attack for two or three months. During the attacks she often had a burning sensation which she referred to her throat, and after taking food it would generally be vomited up about an hour and a half later. In the vomit slight streaks of blood were noticed in the early attacks. During later years the attacks have not been so frequent, but they have been more severe. Four months ago the patient had her worst attack. This was accompanied by a great deal of bleeding, the patient being unconscious for twenty-four hours. In the interval between the early attacks and the last one, no blood had been noticed in the vomit. The patient has always been very constipated. For months she has not been able to take any solid food without vomiting. The pain comes on soon after eating.

Examination.

The patient is rather thin. No enlargement of the stomach could be made out on palpation. No splash could be discovered and no peristalsis could be seen.

X-Ray Report.

X-ray examination shows an irregularly shaped stomach, especially at the lower end of the cardiac and pyloric portions. The bismuth was retained at the cardiac end, and passed with difficulty to the pyloric end. Once there it passed freely through the pylorus. From appearance this may be due to adhesions or to a neoplasm.

Operation.

An operation was performed on June 10th. The abdomen

Fig. 10.—Case v: Hour-glass contraction and pyloric stenosis. Gastroplasty and pyloroplasty openings are shown at x and y respectively. The incision at x is a little anterior to the border of the stomach, which is occupied by the drawn-up gastro-ocolic ligament and its large blood vessels. In this case the cardiac pouch was the smaller.

pyloroplasty after Finney's method was performed for the relief of the pyloric constriction. (Fig. 10.) This was not quite so satisfactory as usual, because the pylorus was not freely movable. The patient made a rapid and good recovery. She was last heard of early in December, 1910, when she was in excellent health and able to eat full diet.

CASE VI.

Previous History.

Mrs. W., aged 39. The patient (sent by Dr. A. J. Russell and by Dr. John Robertson) has never been very robust, although she never suffered from any illness until she was 17 years of age, when she had attacks of sickness. A gastric ulcer was diagnosed and treated. The attacks passed off and the patient remained fairly well, except for indigestion, of which she had a very severe attack about nine years ago. Two years before admission she began to suffer from attacks of sickness after meals. The sickness occurred sometimes directly after a meal and sometimes after two or three hours. The vomiting was sometimes unaccompanied by nausea and almost effortless. A clear, colourless fluid was first brought up, followed by food. The sickness was unaccompanied by any other symptoms, except that the constipation, from which the patient had always suffered, became more severe. The attacks of sickness lasted usually for two or three days, and have persisted, with intervals of not more than a month, till admission. The patient began to waste. Nine months before admission the patient began to suffer from severe pain after meals. This was situated a little below the left costal margin close to the middle line. It was relieved by vomiting and tended to spread downwards to the hips. It was frequently referred to the right and left lumbar regions and to the left shoulder. With the pain a number of other symptoms appeared. Bright blood was passed in the motions, which gave place later to tarry motions during the attacks. The patient had difficulty in swallowing solid and semisolid foods, but not liquids. A feeling of obstruction was referred to the episternal notch. The patient was unable, both

during and between the attacks, to take more than a cupful of food at a time. A lump appeared under the left costal margin. It was especially marked after taking food, but never quite disappeared. The attacks, which now became more frequent, were accompanied by severe headaches and shivering. The patient began to lose weight more rapidly. Between the attacks she feels fairly well and is able to take a light diet of fish, etc. She has been feeling better during the last few weeks.

Examination.

The patient, when examined on November 3rd, 1910, was very thin, with a carinated abdomen and no subcutaneous fat. No tumour could be felt and no signs of dilatation of the stomach could be made out. The diagnosis of hour-glass contraction was suggested chiefly because of the patient's history, and the absence of signs of dilatation of the stomach, the recent rapid wasting, and the fact that she could not take more than half a tumblerful of liquid at a time, and even that gave her great discomfort. She was admitted into Guy's Hospital on November 9th. A test meal was given and the contents of the stomach removed some hours later and sent for chemical examination. There was no free hydrochloric acid. On the morning of the 10th the patient was given a bismuth meal and examined with the x rays. This immediately showed the cardiac pouch, and soon afterwards a narrow streak of bismuth passing downwards to the right from the right border of the cardiac pouch. No second examination was possible some hours later, because the apparatus had gone wrong, but hour-glass contraction was strongly suspected from the x-ray appearances.

Operation.

On November 11th, 1910, the abdomen was opened through the epigastric angle a little to the right of the middle line. There was some free fluid in the abdomen and a large hard mass was found under cover of the liver to which it was adherent. This mass was a little to the right of the middle of the stomach, the lower border of which had been drawn up towards the upper, which was firmly adherent to the liver. It was 3 in. long, and the constriction was tubular and very tight. The mass was also adherent posteriorly and to the mesocolon. The pyloric pouch was small, and the pylorus was not constricted. The duodenum was dilated. It was impossible to bring the cardiac and the pyloric pouches together, because of the small size of the pyloric pouch, and especially the rigidity and extent of the growth. Moreover, it was clearly sufficient to drain the cardiac pouch into the intestine. The cardiac pouch was small, and so tightly distended that it could not be brought into the wound. A stomach tube was sent for, but meanwhile an attempt was made to empty the cardiac pouch through the constriction, and this succeeded sufficiently to allow a pouch of the stomach to be got into the clamps. A posterior gastro-jejunostomy was impossible, because the growth was adherent to the mesocolon. Therefore the jejunum, 8 in. from the duodenum, was joined to the front of the lower left anterior part of the cardiac pouch well away from the growth, the jejunum being turned to the right, so that the distal part of it could be attached to the lower end of the gastric wound for better drainage. The splenic flexure was so movable that it was easy to place the loop of the jejunum to the left of the transverse colon instead of in front of it and the lumbar spine. As it lay in the hollow of the left loin it seemed to be in a very satisfactory position for drainage. The abdomen was closed in layers, catgut being used for the peritoneum and rectus sheath, salmon-gut uninterrupted sutures for the skin and rectus sheath, and catgut for the skin.

PATHOLOGY.

For a long time hour-glass contraction was thought to be nearly always congenital in origin, but Moynihan has shown that it is almost invariably due to gastric ulcer. The ulcer, which is generally placed at the lesser curvature and extends on to the anterior and posterior surfaces of the stomach, gradually contracts and draws the greater curvature upwards. Adhesions also form to the under surface of the liver, to the anterior abdominal wall, or towards the spine. These may drag upon and narrow the stomach. In a few cases carcinoma may give rise to hour-glass contraction, but it is probable that even then a simple ulcer is the primary lesion. The history of my sixth case suggests this view. There is little doubt that spasm of muscle around an ulcer also plays an important part in narrowing the tubular orifice joining the two gastric pouches, and it must be remembered that hour-glass contraction frequently develops in the neighbourhood of the mid-gastric sphincter. There is a specimen in the museum at Guy's Hospital showing a moderate degree of hour-glass contraction due to gastrectomy. In 5 of my patients the contraction was undoubtedly due to gastric ulcer. In 4 of them there was active ulceration at the time of operation, and in one of these the left lobe of the liver was excavated by the ulcer. In the other 2 there was so much thickening and scarring as to leave no doubt as to the previous existence of ulceration. The situation of the constriction varied a good deal; thus the cardiac pouch was the larger in 3 and the pyloric in the other 3. In Case 1 the cardiac

pouch was extremely small, being only a little larger than an ordinary hen's egg. Usually, the cardiac pouch is the larger. In 2 of my 6 patients the pylorus was also contracted as the result of previous ulceration. In these 2 the pyloric pouch naturally was dilated, and was even larger than the cardiac.

DIAGNOSIS.

It is a very striking fact that 5 of the 6 patients had suffered from severe gastric symptoms for many years—1 for 26 years, 1 for 22, 1 for 15, 1 for 9, and 1 for many years. The chronic course of the disease is dependent upon the position of the ulcer opposite a wide part of the stomach, where it takes a long time to cause obstruction. It is notable that in the only case in which the ulcer was in the pre-pyloric region the symptoms progressed far more rapidly and terminated in tetany within two years of the first symptom. It is noteworthy that melaena only occurred in one of the patients, and that haemorrhage is not recorded at all in 3 of them and only once in the others. All the patients had wasted a great deal, and 3 of them looked so ill as to suggest the existence of malignant disease. Various signs which are supposed to be of diagnostic value may now be mentioned. The following account is taken from Mr. Moynihan's¹ classical paper upon the subject:

1. If the stomach tube be passed and the stomach washed out with a known quantity of fluid, the loss of a certain quantity will be observed when the return fluid is measured. Thus, if 30 oz. be used, only 24 can be made to return. Wölfler, who called attention to this sign, said that some fluid seemed to disappear "as though it flowed through a large hole"—as, indeed, it has, in passing from the cardiac to the pyloric pouch. (Wölfler's "first sign.")

2. If the stomach be washed out until the fluid returns clear, a sudden rush of foul, evil-smelling fluid may occur; or if the stomach be washed clean, the tube withdrawn and passed again in a few minutes, several ounces of dirty offensive fluid may escape. The fluid has regurgitated through the connecting channel between the pyloric and cardiac pouches. (Wölfler's "second sign.")

3. *Paradoxical dilatation.* If the stomach be palpated and a succussion splash obtained, the stomach tube passed, and the stomach apparently emptied, palpation will still elicit a distinct splashing sound. This is due to the fact that only the cardiac pouch is drained; the contents of the pyloric remain undisturbed, and cause the splashing sound on palpation. For this phenomenon Jaworski has suggested the appropriate name of "paradoxical dilatation." Jaboulay has pointed out that if the cardiac loculus be filled with water, a splashing sound can still be obtained by palpation over the pyloric pouch. The sign of paradoxical dilatation is best elicited after washing out the stomach in the ordinary manner. When the abdomen is examined at the completion of the washing, and when the stomach has been apparently drained quite dry, a splashing sound is readily obtained, for some of the fluid used has escaped into the pyloric pouch through the connecting channel.

4. Von Eiselsberg observed in one of his cases that on distending the stomach a bulging of the left side of the epigastrium was produced; after a few moments this gradually subsided, and concomitantly there was a gradual filling up and bulging of the right side.

5. Von Eiselsberg also called attention to the bubbling, forcing, "sizzling" sound which can be heard when the stethoscope is applied over the stomach after distension with CO₂. If the two halves of a seidlitz powder are separately given, and the stomach be normal or dilated, no loud sound is heard anywhere except at the pylorus; if a constriction is present in the stomach a loud, forcible, gushing sound can be easily distinguished at a point 2 or 3 in. to the left of the middle line.

6. I first called attention two years ago to a sign which I have since found of great service in establishing a diagnosis of hour-glass stomach. The abdomen is carefully examined, and the stomach resonance is percussed. A seidlitz powder, in two halves, is then administered. On percussing, after about 20 or 30 seconds, an enormous increase in the resonance of the upper part of the stomach can be found, while the lower part remains unaltered. If the pyloric pouch can be felt or seen to be clearly demarcated the diagnosis is inevitable, for the increase in resonance must be in a distended cardiac segment. If the abdomen be watched for a few minutes the pyloric pouch may sometimes be seen gradually to fill and become prominent.

7. Schmidt Monard and Eichhorst have both seen a distinct sulcus between the two pouches inflated with CO₂.

... The two aids to diagnosis of greatest value are, it will be seen, the washing out of the stomach and its inflation with gas by the administration of a seidlitz powder in two portions.

But most of these methods are only of historical interest, and although they are worthy of notice on this account, no reliance can be placed upon negative results obtained from their application. Positive results are certainly of value, especially the escape of turbid fluid through the tube after the stomach has been apparently washed clean. The

result of inflation with gas may also be useful. It is obvious that positive results cannot be expected from these tests if the constriction is at all tight, and these are the very cases in which prompt diagnosis is most important.

The bismuth and x-ray test if carefully applied is reliable and is by far the best clinical method of finding out if there is or is not hour-glass contraction. It also serves to show if there is pyloric obstruction as well, for in the absence of this complication the bismuth passes from the pyloric pouch into the intestine in a natural way. To obtain accurate results from it, experience and careful interpretation are required, for a casual examination may lead to a wrong diagnosis. It is absolutely necessary to examine the patient both in the vertical and horizontal positions.

1. Hour-glass contraction has been diagnosed when a subsequent operation has shown that the condition does not exist. Dr. Hertz tells me that the mistake is due to the weight of the bismuth in the lower part of a dilated dropped stomach. This drags upon and narrows the middle part of the stomach, giving it an appearance somewhat resembling, but not identical with, that due to hour-glass contraction. If a patient with dilatation of the stomach and gastropnoia be examined upon the screen while taking the bismuth, the latter can be seen to pass immediately into the lower part of the stomach, whereas with hour-glass contraction the bismuth takes a long time to reach the pyloric pouch. Moreover, the dark line joining the two shadows passes from the lowest point of the upper one when the stomach is merely dilated, but from the right border when there is true hour-glass contraction. It is also probable that spasm of the mid gastric sphincter occasionally makes a narrowing somewhat resembling hour-glass contraction. The writer has seen this spasm during an operation for duodenal ulcer. An ulcer upon the lesser curvature and adherent to the liver may so limit the mobility of the stomach as the patient stands as to produce an apparent hour-glass contraction. The constriction of the shadow disappears when the patient assumes the horizontal position.

2. Hour-glass contraction may be overlooked when the stricture is very tight, unless the screen examinations are repeated several hours after the bismuth meal is taken. The bismuth method was used for five of my patients, and in all of them it was successful. The examinations were kindly made by Dr. Hertz (2), and Dr. Morton (3), one of the patients being examined by each observer. The writer examined Case 1. Other methods of examination were used, but the results compared very unfavourably with those obtained by the bismuth method. In two cases the constriction was so tight as to make all other methods useless.

Case 1 presented unusual difficulties of diagnosis because the patient was unable to swallow more than a very little at a time, although there were evident signs of dilatation of the stomach. The first sign suggested oesophageal stricture and the latter pyloric obstruction; but hour-glass contraction with a small cardiac pouch seemed the most likely explanation in view of the history. Examination by the x-ray and bismuth method settled the point in a few minutes in a most graphic and conclusive way. It is important to ascertain if there is any active ulceration as well as hour-glass contraction. If there is much pain and also localized tenderness in the epigastrium, the presence of ulceration may be suspected. This suspicion may be confirmed by the discovery of blood pigment in the vomit or faeces. Superadded malignant disease may be strongly suspected by the absence of free hydrochloric acid in the gastric contents or the presence of a hard swelling in the epigastrium, or of enlarged glands at the root of the neck.

TREATMENT.

The experience of pyloric constriction and the past history of hour-glass contraction make it clear that medical treatment by dieting and lavage should not be continued if the patient is losing ground. The risk of operation is slight if undertaken before the obstruction is severe, and before the general condition of the patient has been allowed to get bad. It is particularly necessary to operate without delay when ulceration is present, for even if the ulcer does heal as a result of medical treatment, this must lead to an increase of the obstruction. The bismuth method gives a good indication of the tightness of the stricture. The first thing to do

after opening the abdomen is to examine the stomach, the pylorus, and the duodenum thoroughly. Without this precaution it would be easy to overlook either a cardiac pouch or pyloric obstruction. The exact nature of the operation to be performed must depend upon the conditions found upon exploration. The same operation is not suitable for all cases. A good deal depends upon the presence or absence of ulceration, of pyloric obstruction, and of adhesions. When there is no pyloric obstruction, and especially if the pyloric pouch be small, a single posterior gastro-enterostomy is all that is necessary, the cardiac pouch, which is generally large, being easily joined to the jejunum. With an open pylorus there is no fear of stasis in the pyloric pouch. The condition then differs very little from ordinary pyloric obstruction, for which posterior gastro-jejunostomy is satisfactory. When pyloric obstruction complicates hour-glass contraction there is more doubt as to the best treatment. A double posterior gastro-enterostomy is not satisfactory for various reasons. It is difficult to drain the two pouches thoroughly through the limited space available within the loop of blood vessels in the mesocolon. Moreover, there are usually a great many adhesions to the back wall of the lesser sac, and the transverse mesocolon may be considerably shortened; and in some instances, as in Case I, it is impossible to join the jejunum to the posterior surface of the very small cardiac pouch without risk of obstruction of the drawn-up jejunal loop by the contraction of the opening in the transverse mesocolon. Moreover, a double gastro-enterostomy through the small bloodless space available in the transverse mesocolon would be difficult and would probably lead to retraction or kinking of the jejunum with vicious vomiting. A double anterior gastro-enterostomy would be still more unsatisfactory, judging from the results of a single anterior gastro-enterostomy for pyloric obstruction. In some cases a single posterior gastro-enterostomy may be combined with gastroplasty or gastro-gastrostomy. The jejunum is then joined to the pyloric pouch, but I did not adopt this combination in either of my two cases, because in them the strictured pylorus was freely movable and clearly amenable to treatment by Finney's operation. This, to my mind, is more satisfactory in these cases, because it can be performed in far less time, and particularly because it carries no risk of vicious vomiting, which is still to be dreaded, especially in women exhausted by years of chronic gastric disease. It may be said that Finney's operation does not drain the stomach so well as gastro-enterostomy, but this depends a great deal upon the size of the opening, which can be made very large by Finney's method. Gastro-enterostomy is considerably better when there is active ulceration or extensive adhesion at the pylorus. As to the relative merits of gastroplasty (Kammerer) and gastro-gastrostomy, much depends upon the presence or absence of active ulceration, intractable adhesions, and upon the size and accessibility of the cardiac pouch. When there is active ulceration around the tubular stricture it is clearly better not to cut into the ulcerated area, but to adopt gastro-gastrostomy. Inseparable adhesions, especially with ulceration invading the liver (as in Case II), or a very small cardiac pouch (as in Case I), make gastroplasty very difficult and unsuitable, for some of the sewing would have to be done very deep in the epigastrium under cover of the left costal margin. For such cases, at least, gastro-gastrostomy is safer and preferable, although it may not appear to be so perfect in an anatomical sense. It must be remembered, however, that the pyloric is almost vertically below the cardiac pouch in these cases, as shown by the bismuth and x-ray method, and that a gastro-gastrostomy, with a very large opening therefore, provides satisfactory drainage. Usually a very large opening can be made in fairly healthy tissues. The aperture should be, whenever possible, at least 4 in. long. Unless the cardiac pouch is very small this can be provided if the aperture in the stomach be made curved, starting about 1 in. below the stricture and extending about 1 in. in front of the greater curvature as far as may be required. (Vide Fig. 8.) A vertical incision, as figured in some of the books, cannot be made of sufficient length. There is very little tension upon the suture line when this method is adopted, for the pyloric is not folded in front of the cardiac pouch. The stricture, which is relatively fixed, is neither displaced nor folded. The very

movable lower borders of the gastric pouches are simply approximated. As far as external appearances go the natural shape of the stomach is almost restored by the operation. In only one of my patients was Kammerer's operation feasible. (Vide Fig. 10.) Moynihan² records one remarkable case in which it was impossible to join the cardiac to the pyloric pouch owing to adhesions. In this case he opened the pyloric pouch, and dilated the stricture in a retrograde manner, and to his surprise the patient made a good recovery. In the absence of complicating pyloric obstruction it is not necessary to add gastro-enterostomy to gastro-gastrostomy or gastroplasty, although it would appear at first to be a precaution against recurrence of ulceration and stenosis. As already pointed out, the x rays have shown us that sufficient drainage of the cardiac pouch can be provided by joining it to the pyloric one, which is not nearly so far to the right as we used to think. Moreover, a superfluous gastro-enterostomy increases the immediate danger of the operation, and introduces the risk of vicious vomiting, which is still to be remembered, especially in women. When hour-glass contraction is due to growth, or there is a reasonable suspicion that the chronic ulcer is becoming carcinomatous, partial gastrectomy is the only radical treatment. The open end of the duodenum may then be closed, and the jejunum joined to the cardiac pouch. Occasionally it may be possible to perform a radical operation, and then to join together the remainder of the cardiac and pyloric pouches without tension. When the growth is irremovable, temporary relief may be obtained by joining the jejunum to the cardiac pouch as far away from the growth as possible. For my sixth patient anterior gastro-enterostomy was the only possible operation, for the carcinoma had invaded the transverse mesocolon. The opening into the stomach was made as far as possible to the left, and well away from the growth, and the jejunal loop was then placed in the left loin to the left of the splenic flexure of the colon, with the object of lessening the risk of vomiting.

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ACUTE DILATATION OF THE STOMACH: GASTROTOMY: RECOVERY.

BY

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NEARLY all the recorded cases of acute dilatation are alike in obscurity of cause and fatality of termination. The following notes refer to a case in which one cause was not only clear but removable, and the result was uninterrupted recovery.

A girl, aged 23, was advised by a wise woman to eat figs in order to burst a small abscess in the axilla. She ate nearly a pound of dried Turkey figs at 11 a.m., December 24th, 1910. Two hours later ineffectual retching set in with abdominal pain, which continued with increasing severity all day and the following night. The bowels moved slightly in the evening. The girl had several alarming attacks of breathlessness in the night.

I was summoned at 9 a.m. next day. The abdomen was not distended, and moved slightly with respiration. There was a general slight increase of resistance and a diffuse tenderness, most noticeable between the umbilicus and the left anterior superior spine. The pain had come on gradually and was now severe, especially in the epigastrium, but also in the left iliac region. The pulse was 84 and the temperature normal.

After examination she sat up with a sudden cry and gasped for breath; the pupils dilated fully, and showed momentarily a slight red reflex. For about ten seconds she looked as if she might fall back dead. When she regained her breath a little brandy and water was given and she began to retch, but only a little fig pulp came up. As this seemed too thick to flow through a stomach tube, none was passed lest it should provoke another attack of dyspnoea.

One hour later a slightly-distended dull area could be made out below and to the left of the umbilicus. An enema of soap and water was ordered and hot applications to relieve the pain, but no morphine was given at this stage.

At 3 p.m. (twenty-six hours after the onset of pain and vomiting) the patient felt no better, although the enema had acted well. The abdomen hardly moved on respiration and was distended, especially in the hypogastric and left iliac regions, which were dull. The left flank was also dull. A uniformly tympanitic note was elicited from the ensiform cartilage to a point well below the umbilicus. The stomach