**The surgical treatment of gastric and duodenal ulcers.**

# THE SURGICAL TREATMENT OF GASTRIC AND DUODENAL ULCERS

MOYNIHAN

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BY

B. G. A. MOYNIHAN, M.S. (LOND.), F.R.C.S. ENG.,

Senior Assistant Surgeon, Leeds General Infirmary; Consulting Surgeon to the Skipton Hospital and to the Mirfield Memorial Hospital; Member of the Board of Examiners in Anatomy for the Fellowship, and formerly Arris and Gale Lecturer, Royal College of Surgeons of England

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In the following pages I propose to discuss my own experience in the operative treatment of simple ulcer of the stomach and duodenum, and to tabulate the cases upon which I have operated. The subject will be dealt with under the following headings :

1. Perforation of Gastric or Duodenal Ulcers.
2. Hemorrhage.
3. Chronic Ulcer.
4. Hour-glass Stomach.

## 1. PERFORATION OF GASTRIC OR DUODENAL ULCERS.

The perforation of a gastric or duodenal ulcer is one of the most serious and most overwhelming catastrophes that can befall a human being. The onset of the symptoms is sudden, the course rapid, and unless surgical measures are adopted early, the disease hastens to a fatal ending in almost every instance.

Perforation of the stomach is usually described as being of two varieties, *acute* and *chronic ;* but there is an intermediate class of cases, not embraced by either of these terms, which is best described as *subacute.*

**In acute perforation** the ulcer gives way suddenly and completely. A larger or smaller hole results, and through this the stomach contents are free to escape at once into the general cavity of the peritoneum.

**In subacute perforation** the ulcer probably gives way almost as quickly as in the acute form, but, owing to the small size of the

ulcer, or to the emptiness of the stomach, or to the instant plugging of the opening by an omental flap or tag, or to the speedy formation of lymph, which forms, as it were, a cork or lid for the ulcer, the escape of fluid from the stomach is small in quantity and the damage inflicted thereby is less considerable. The symptoms at their onset may be as grave as those in acute perforation, but on opening the abdomen the ulcer may be seen to be plugged, and no further escape of fluid is occurring.

In the subacute form of perforation I have found that there is always a complaint of greater discomfort for several days preceding the rupture. Vague general or localized pains have been felt in the abdomen, or a sharp spasm or "stitch" when the patient turned quickly or attempted to laugh. One girl, a housemaid, felt the pain down her left side especially when reaching up to her work; another said that it hurt her to bend, as her side felt stiff. These premonitory symptoms are important, and if recognized they should enable us to take measures to prevent the occurrence of perforation. They doubtless have their origin in a localized peritonitis, and the stiffness is due to the unconscious protection of an inflamed area by a muscular splint.

**In chronic perforation** the ulcer has slowly eaten its way through the stomach coats, and a protective peritonitis has had time to develop at the base. The escape of stomach contents is, therefore, local merely; barriers of lymph confine the fluid to a restricted area, and a perigastric abscess may form. A chronic perforation occurs more frequently on the posterior surface of the stomach, and the perigastric abscess occasioned thereby is recognized as "subphrenic." The acute and subacute forms of perforating ulcer are more common on the anterior surface.

There can be no doubt that recovery by medicinal treatment alone is possible both in the acute and in the subacute forms of perforation. I have had two cases under my care in which a diagnosis of perforation had been made by competent medical men. In both an operation was impossible, as no skilled help was available until the urgency of the symptoms seemed to have passed off. When I operated many months later, the evidences of peritonitis completely surrounding the stomach were undeniable. Though patients may recover, their recovery cannot be urged

as a reason for the delay or withholding of surgical help in all cases. For the possibility of spontaneous recovery, though not denied, is yet so remote as to make it imperative to adopt operative treatment at the earliest possible moment. The risk of operation is definite, the hazard of delay is immeasurable. There are times when the diagnosis may be difficult. If morphin has been administered to still the intolerable pain, the patient's condition becomes placid and comfortable. It may be almost impossible then to recognize the extreme urgency of the case. In such circumstances I have, however, placed great reliance upon a continued hardness and rigidity of the abdominal muscles. Even when the patient expresses herself as free from pain, when the aspect has become natural, and when the pulse has returned to the normal, the abdominal rigidity remains. In the case of I. S., a girl aged seventeen, upon whom I operated for a perforated duodenal ulcer, the medical man who sent her to the Infirmary had diagnosed a perforated gastric ulcer and had told the patient and her parents that immediate operation alone could save her life. Having obtained consent to operation, he despatched the girl to the Infirmary and gave a hypodermic injection of $\frac{1}{4}$ gr. morphin to lessen the distress of the journey. When I saw her, shortly after her arrival, she looked in perfect health, she had no suffering, and her pulse and respirations were normal. The abdomen, though not distended, was absolutely rigid and immobile, and I did not hesitate to operate at once. In any uncertain case I should incline to operation rather than to indefinite postponement to solve the diagnosis.

I have seen a difficulty in diagnosis arise, and I know of three cases in which negative exploration had been performed, when the patient was a woman at the commencement of a menstrual period. From some unexplained and indeterminate cause a sharp attack of abdominal pain, followed by vomiting, distention, prostration, and collapse, had occurred in all, and had caused a confusion in the diagnosis. In the case under my own observation a history of previous similar, though less severe, attacks at the menstrual epoch, and the absence of any marked abdominal stiffness or tenderness, though the belly was obviously distended, enabled me to negative the question of perforating ulcer of the stomach.

A difficulty may also arise in the diagnosis of a perforated duodenal ulcer. In a paper published by me in the "Lancet" in December, 1901, I drew attention to the fact that in 18 cases, out of a total of 49 recorded, a diagnosis of appendicitis had been made, and an operation had been undertaken for that condition. The symptoms and signs in all these instances had been limited to the right iliac region or had been more accentuated there. This is due to the fact that, owing to a hillock in the transverse mesocolon, under the pyloric end of the stomach, extravasated fluids are directed downward and to the right into the right renal pouch, and thence to the right iliac fossa.

The operation for perforated ulcer should be conducted speed-

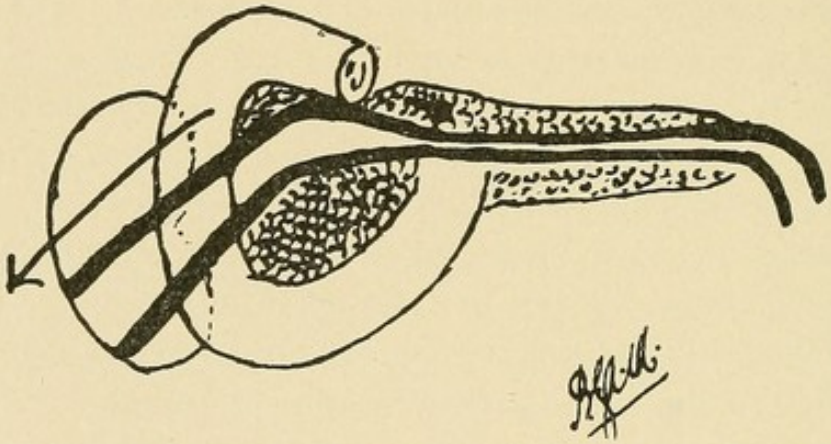

Fig. 1.—Diagram showing the direction of the flow of fluid in duodenal perforation. The fluid passes to the right kidney pouch and to the right iliac fossa, and causes the symptoms to mimic those of appendicitis.

ily, and all means adopted to save the patient from shock. The excision of the ulcer is not necessary. My practice is to close the ulcer at once by a single catgut suture taken through from side to side so as to prevent any further leakage during the application of the sutures. I apply two continuous sutures of Pagenstecher thread, which infold the ulcer and a portion of healthy stomach around it. After the stitches are completed the cleansing of the peritoneum is begun. If there is much soiling, a free flushing of the cavity is necessary; if the operation is done within ten or twelve hours, a gentle wiping of the surrounding area with wet swabs will suffice. Drainage, as a rule, is not necessary, except in the late cases. When adopted, it should be free, a split tube

and a gauze wick being placed in the original incision and in a second suprapubic opening. I have preferred the enlarging of the original incision, and free flushing through that, to the method of multiple incisions advocated by Finney. One point I think requires emphasis: it is the multiplicity of perforating ulcers. As soon as the ulcer first discovered is sutured, a rapid survey of the whole stomach is desirable in order that any other ulcer may be laid bare. An examination of a large number of recorded cases has shown that double perforation occurs in no less than 20 per cent. In the majority the second ulcer was on the posterior surface at a point exactly apposed to the first. In duodenal ulceration the perforation may be very large; the ulcer seems to have fallen out bodily. When the gap is stitched up, a narrowing of the caliber of the duodenum results, and it may therefore be necessary to give an alternative route from the stomach by performing gastro-enterostomy.

## 2. HEMORRHAGE.

THE bleeding from gastric or duodenal ulcers is recognizable either as hematemesis or as melena. In lesser degree these symptoms are seen not infrequently; in their severer forms they are of dire significance, and may be the sole cause of the patient's death. It is but rarely that the surgeon is called upon for so momentous a judgment as is necessary in cases of severe hematemesis or severe melena. For the condition of the patient is poor—even, at times, desperate. Operative intervention is therefore hazardous; yet a continued bleeding will inevitably end in death. The question as to the conditions under which surgical treatment is prudent or imperative is one that has interested me deeply, and as my opportunity for seeing extreme examples of hemorrhage and of deciding upon the treatment has been large, I may briefly state my position and the reasons for my action.

It is necessary at the outset to emphasize the fact—a fact frequently ignored—that hemorrhage may manifest itself under entirely different circumstances in different patients. In some it is the earliest and for a time the only symptom of gastric disturbance; in others it is the last expression in a long and tedious course of symptoms. In other words, the hemorrhage may occur from an *acute* or from a *chronic* ulcer of the stomach or duodenum. It will be found when the clinical history of a series of cases is examined that whereas in the latter the bleeding varies within the widest limits as regards both quantity and frequency, in the former the clinical history is repeated in case after case in a most remarkable manner.

**Hemorrhage from an Acute Ulcer.**—Under the term "*acute ulcer*" of the stomach are probably included several varieties of pathologic conditions which are different in causation, different in destiny, but alike in the single fact that their clinical recognition is due to the bleeding which occurs from them in abundant quantity. There is the ordinary peptic ulcer; there is the minute erosion, barely recognizable even on close scrutiny, which opens up a

vessel; and there are "weeping patches" and "villous areas" and similar indetermiate conditions which have been recognized when the stomach has been explored during life. To the clinician all these conditions are betrayed by their tendency to hemorrhage.

In almost every instance the hemorrhage is the first symptom. Even on close inquiry it is difficult to elicit any history of antecedent gastric discomforts. The vomiting of blood comes unexpectedly and suddenly, a large quantity of blood is lost, and the patient suffers, often in an extreme degree, from the symptoms of hemorrhage. The pulse becomes feeble and fluttering, the face waxen, the breathing rapid and shallow, the body-surface cold or clammy. For a time the symptoms may give rise to serious alarm, but a rally is seldom long delayed. The bleeding is checked spontaneously, and vomiting is rarely repeated, or, if repeated, the quantity of blood lost is but small.

In several of my cases a sudden, apparently causeless hemorrhage has ushered in a long train of symptoms of dyspepsia. The acute ulcer has been the precursor, or rather the earliest stage, of a chronic ulcer.

The characteristics of hemorrhage from an acute gastric ulcer are, therefore: *spontaneity, abruptness of onset, the rapid loss of a large quantity of blood, the marked tendency to spontaneous cessation, the infrequency of a repetition of the hemorrhage in anything but trivial quantity, and the transience of the resulting anemia.*

**Hemorrhage from a Chronic Ulcer.**—The bleeding from a chronic ulcer of the stomach or duodenum may vary within the widest limits of both frequency and quantity. For convenience of description I should arrange the cases in four groups.

1. In the first the hemorrhages are latent or concealed. The blood lost is small in quantity, and may be recognized only after minute examination of the stomach contents or of the feces. The estimates given by various writers as to the occurrence of hemorrhage in ulcer vary between 20 per cent. and 80 per cent., and we are entitled to assume that this wide divergence of statement is due not so much to differences in the symptoms of ulcer, but rather to the varying degrees of closeness with which the cases are observed, and to differences in the frequency and minuteness of examination of the stomach contents or the feces. It would probably not be

rash to assume that all ulcers of the stomach or duodenum bleed at some time or other; but if the bleeding be trivial and infrequently repeated, it is never likely to obtain clinical recognition.

2. In the second group should be included those cases which are characterized by intermittent hemorrhage. The bleeding is copious but transient, and occurs at intervals of two, three, or more months. An exemplary instance of this class is the following:

A. S., female, aged twenty-eight. In May, 1898, the patient had a sudden attack of profuse bleeding from the stomach. She was in bed six weeks. For eighteen months after this her health was very poor; indigestion was constant, vomiting was occasional, constipation was invariable. For six months she was then in fairly good health, and was able to take food much better. In April, 1900, indigestion became severe, and a copious hemorrhage again occurred. Treatment was continued for six months with much benefit. In January, 1902, a third attack of hematemesis and fainting; after this she was kept in bed for four weeks. In September, 1902, there was again hematemesis as severe as before. From then to January, 1903, she was under constant treatment, but improvement was very slow. Anemia has been a prominent symptom since April, 1900. At the operation a large ulcer was found in the stomach, and a second in the duodenum. Gastroenterostomy was performed.

In all the cases in this group indigestion is a prominent symptom. The hemorrhage often occurs without apparent cause, but at times there may have been noticed an exacerbation of gastric discomfort and uneasiness for a few days. Anemia is almost constant.

3. In the third group the cases are characterized by hemorrhages which are rapidly repeated and on all occasions abundant. In the majority of patients the symptoms of indigestion, which have been noticed for months or years before, have undergone an appreciable increase in the recent days. Then, suddenly, the hemorrhage occurs; a large quantity, a pint or a pint and a half, of blood is vomited. The patient may faint from loss of blood; he shows, always, the general symptoms of bleeding. For twelve or twenty-four hours the vomiting ceases, to reappear at the end

of this time without apparent cause and in equal or greater quantity. A second latent period is followed by a further hemorrhage, and so the patient passes into a condition of the gravest peril.

No better example of this class could be cited than the following:

N. W., female, aged twenty-four. Has suffered from symptoms of gastric ulcer, pain, vomiting, and inability to take solid food for fifteen months. Eleven weeks before admission to hospital all her symptoms became worse. Vomiting became frequent; pain was almost intolerable. During the five weeks before admission she vomited daily, and on almost all occasions some blood came. While waiting in the hospital she vomited three times in five days, and on each occasion about half a pint of blood came. She was seriously ill and very blanched. Pulse 112. The motions were tarry on two occasions. At the operation two old scars and one showing recent inflammation were seen. Gastro-enterostomy led to perfect recovery.

4. The fourth group would comprise those cases in which the hemorrhage occurs in enormous quantity, inundating the patient and leading to almost instant death. The opening of the splenic artery, the aorta, the vena cava, or the pancreatico-duodenal vessels allows of such a rapid escape of blood that the patient dies as surely and as swiftly as if his carotid or femoral vessels were divided. Such cases, fortunately, are rare. In my own experience only one such example has occurred, a large oval opening being found in the splenic artery.

If, then, we accept the classification of cases of hemorrhage from gastric or duodenal ulcer into four groups suggested, we may define their characteristics as follows:

1. The hemorrhage is latent or concealed, is always trivial, and often inconspicuous.

2. The hemorrhage is intermittent, but in moderate quantity, occurring spontaneously and with apparent caprice at infrequent intervals. The life of the patient is never in jeopardy from loss of blood, though anemia is a persisting symptom.

3. The hemorrhage occurs generally, but not always, after a warning exacerbation of chronic symptoms. It is rapidly repeated, is always abundant, and its persistence and excess cause

grave peril, and will, if unchecked, be the determining cause of the patient's death.

4. The hemorrhage is instant, overwhelming, and lethal.

## THE TREATMENT OF HEMORRHAGE.

(A) From an Acute Ulcer.—If what has been said of the characteristics of hemorrhage from an acute ulcer proves to be true, it is clear that the aid of the surgeon will rarely need to be invoked. Medicinal means alone will suffice in almost every instance to insure the recovery of the patient. Though the hemorrhage is alarming from its suddenness and intensity, it may confidently be predicted that in the majority of cases it will not recur, or that if it recur, the quantity lost will certainly be small.

There are, however, a few cases in which the hemorrhage may be both copious and recurring and may threaten the life of the patient. Under such circumstances an operation may be required. An examination of the recorded cases has convinced me that wherever surgical treatment is deemed advisable, gastro-enterostomy, speedily performed, will prove the surest means of leading to the arrest of the bleeding. In not a few records one reads that the whole surface of the mucosa seemed to be "weeping" blood, that multiple points of oozing appeared scattered irregularly over the stomach wall, or that a definite source of the blood, any point from which the blood chiefly ran, could not be ascertained. The surgeon has then fallen back upon stypties or the cautery, or the ligating of a villous patch in mass. It is difficult to convince one's self that any of these procedures have had the smallest effect for good; and in some the bleeding has recurred after the operation and has determined the fatal issue. A search for a bleeding point is futile, harmful, and, in my judgment, quite unnecessary. The performance of gastro-enterostomy will prove more effective than any other procedure both in checking the hemorrhage and in preventing its recurrence.

(B) From a Chronic Ulcer.—It is mainly in regard to the cases included in Group 3 of the classification given above that the question of surgical treatment will arise. If we picture to ourselves the pathologic conditions present in such a case, it will be seen

that though the bleeding may be spontaneously checked for a time, it will show a marked tendency to recur. The base of the ulcer is, as a rule, densely hard, and the vessel traverses it like a rigid pipe. The vessel is eaten into, as it were, by the ulcer, which erodes one side, leaving a ragged hole. Owing to the stiffening by chronic inflammatory deposit, the artery is unable to contract or retract, and the bleeding can therefore be checked only by the plugging of the opening by a thrombus. That such a plugging does occur there can be no doubt, for in one case I have seen it during life; on gently detaching the cloth the bleeding began at once with furious onset. The tendency, indeed, even in a chronic ulcer such as I have depicted, must be to spontaneous cessation, for in no other way can the stopping and recurrence of bleeding constantly seen be explained. There is some condition, as yet uncertain, which is responsible for the detaching of the plug. This condition I venture to think is distention of the stomach, whereby the base of the ulcer is stretched and the clot disturbed; for my record of cases shows indisputably that a gastro-enterostomy performed upon a patient suffering from this form of bleeding suffices to check the tendency to further hemorrhage and permits of the speedy healing of the ulcer. In all patients so suffering a prolonged search for the ulcer in the stomach is injudicious, and the ulcer, when found, may, as the result of firm fusion with an adjacent structure, be irremovable. In two cases I have excised the ulcer; in the first the ulcer was on the posterior surface of the stomach, and to the opening left by its removal I anastomosed a loop of the jejunum; in the second the ulcer lay on the anterior surface, near the lesser curvature, toward the cardia. In this I did not perform gastro-enterostomy. In all the other cases that I have operated upon I have not attempted to deal directly with the ulcer, but have hastened to perform gastro-enterostomy. Of all the patients, the one upon whom I did not perform gastro-enterostomy was the only one I lost; the others recovered speedily and without further sign of hemorrhage.

In some cases an examination of the stomach may reveal two chronic ulcers, or more, from each of which the blood may be coming. To deal with each would be inadvisable or impossible. Cases are recorded, moreover, in which, after an ulcer had been

excised or ligatured in mass, the bleeding had recurred and proved fatal.

In all cases of hemorrhage from a chronic ulcer, therefore, an operation ought to be performed at the earliest possible moment. Search for, and local treatment of, the ulcer or ulcers are not necessary. A gastro-enterostomy will without doubt prevent a recurrence of the hemorrhage and lead to a rapid healing of the ulcer from which the blood has come.

## 3. CHRONIC ULCER.

Chronic ulcer of the stomach may present itself in great diversity of form. In some the onset is brusque, a copious hemorrhage from an acute ulcer being the first manifestation of gastric disease; after the lapse of a few days or weeks, however, gastralgia, vomiting, and other symptoms appear, and the chronic ulcer is established. In others the onset is latent and the early symptoms subdued. A patient may say that for several months a trivial, vague uneasiness has been experienced, that would have been forgotten but for the later accession of severer symptoms. In still others the course of the disease may present very remarkable intermissions. For several weeks the symptoms may be most marked and disabling, hemorrhage may occur on one or more occasions, but gradually an improvement is observed, and after a time all the distress may rapidly subside, leaving the patient in good health. The appetite may be restored, and the body-weight may increase by a stone or even more. After a few months' interval a recurrence of the symptoms is observed, and all the details of the former illness are repeated and fresh hemorrhages may occur. And so the history may be repeated. In these circumstances the symptoms are due perhaps to the breaking down in the scar of a solitary ulcer, or to the fresh outbreak of ulcerated patches in other parts of the organ; of the two possibilities, the former is certainly the more frequent.

It is not necessary to describe several different varieties of chronic ulcer, as is often done; it is probably more correct to say that chronic ulcer may present symptoms of different character in different individuals, or in the same individual under differing conditions. Thus an ulcer which is latent in onset may give rise to hematemesis and may become latent again, and so the recurrence may continue for prolonged periods. If the illness caused by chronic ulceration persist for several years, the patient may be reduced to the very extremity of weakness. His disease

may then show close resemblance to pernicious anemia or to advanced malignant disease of the stomach.

I have no doubt that many patients who have died from supposed malignant disease of the stomach have suffered from nothing but chronic ulceration. The induration which a persisting ulceration may cause is remarkable both for its extent and for its extraordinary mimicry of the appearances of malignant disease. In some of my own cases, and especially in one case of hour-glass stomach, the mass of inflammatory tissue was, with the knowledge I then possessed, absolutely indistinguishable by inspection and palpation from a malignant growth. Recently, however, I have in doubtful cases been able, I think, to distinguish chronic inflammatory masses by their perfect smoothness of surface. A malignant growth is almost always irregular, knotted, nodular, or "gritty" on the surface; an inflammatory mass is more smoothly rounded off, and there is often a milky opacity of the peritoneum. The frequency with which carcinoma will develop in chronic ulcers is now generally acknowledged. Hauser estimated the frequency at 6 per cent.—a proportion which seems to me to be in excess of the truth. In my own experience only one case has been recognized.

The pathologic conditions caused by chronic ulceration in the stomach are of great variety. When marked cicatricial contraction occurs, the viscus is narrowed at the site of the ulcer, and an hour-glass stomach, or a trifid stomach (Case 14, the only one recorded of this condition), or a dilated stomach due to pyloric or duodenal stenosis results. If the ulcer slowly deepen, a perigastritis is produced, and the stomach may become ankylosed to the abdominal wall, the pancreas, the liver, or any other neighboring structure. In all these conditions, and in others where no warping of the stomach can be found, an inveterate dyspepsia is a common symptom.

It has been the immemorial custom to look upon dyspepsia as due chiefly, if not solely, to deficiency in the quantity or quality of the gastric juice, to some lack of adequate power in the stomach as a secreting organ. But dyspepsia of the intractable, constantly recurring form is more often a matter of physics than of chemistry. In several cases, as my records will show, I have

operated for no other symptom than intolerable dyspepsia, when no diagnosis of pyloric obstruction, hour-glass stomach, or other mechanical deviation from the normal could be made. Yet at the operation abundant proof has been obtained that there was an obvious distortion or puckering or adhesion at one part or another of the organ; and that the stomach was crippled in the freedom of its action by these after-effects of ulceration. One observation that I have repeatedly made in operating upon cases of chronic gastric and duodenal ulcers is that such ulcers are often multiple. If a well-marked ulcer is found at, say, the pyloric end of the stomach on the anterior surface, a second ulcer may be found perhaps at an exactly apposing point on the posterior surface, perhaps elsewhere in the stomach. Chronic gastric ulcers are, in my experience, rarely solitary.

My own records of cases show that a duodenal ulcer very seldom exists without unmistakable evidence of gastric ulcer. Clinical observers have long appreciated the difficulty in the discrimination of gastric from duodenal ulcers. The differentiation is of little moment, however, for if a duodenal ulcer is present we may be almost certain that a gastric ulcer will also be found. It is, indeed, not unlikely that the duodenal ulcer is secondary to, and directly caused by, the gastric ulcer. For there are many reasons, which need not be repeated, which go to prove that duodenal ulcer is due to the action of the gastric juice on the mucous membrane. The ulcers are formed most frequently at the very beginning of the duodenum; and the further the distance from the pylorus, the less likely is an ulcer to be present. May it not be that the digestion of the duodenal mucous membrane is accomplished only, or, at the least, most easily, when there is an excess of free hydrochloric acid? And this condition of hyperchlorhydria is a common, if not a constant, factor at some stage in the history of a gastric ulcer. The sequence of events then would be—gastric ulcer, hyperchlorhydria, duodenal ulcer. The sensitiveness, as it were, of the duodenal mucosa to acid contact is shown by the fact, demonstrated by Pawlow, that the pylorus does not relax to allow of the passage of food until the duodenal contents are alkaline in reaction. Vomiting is an inconstant symptom of chronic ulcer. In the typical case of dilated stomach the vomiting is copious in

quantity, and occurs at intervals of two or three days. The stomach fills slowly till its capacity is exhausted, and then an outburst of vomiting empties away the stagnant fluids. In cases of chronic ulcer without dilatation the patient may be rarely troubled with vomiting. On inquiry it will be found that the abeyance of this symptom is due to self-imposed restrictions in the diet. Indulgence in food will often elicit the latent symptom. In one of my earliest and worst cases of hour-glass stomach the patient, who was in bed and under observation in the hospital for over a week, never vomited, yet the constriction between the two pouches would barely admit the end of a pair of pressure forceps.

The indications for operation in chronic ulcer of the stomach are of widely different character. When the ulcer is near the pylorus, a dilated stomach will probably be the chief clinical sign; when the ulcer is in the body, an hour-glass stomach may be caused; when the ulcer is nearer the cardiac end, gastralgia and dyspepsia may be the only indications.

I feel sure that, speaking generally, the time of the onset of pain after food is some guide to the position of an ulcer. The nearer an ulcer lies to the pylorus, the later will be the period of onset of the pain, and vice versa. Some of the seeming exceptions to this rule are due to the fact, which is commonly overlooked, that multiple ulcer of the stomach and duodenum is the rule. For example, a patient who makes constant complaint of pain within half an hour of food may be found at the operation to have a stenosed pyloric antrum due to ulcer. Yet on examination a second ulcer may be found within 3 or 4 inches of the cardiac orifice, and may at first glance be overlooked. Of such a case I have had personal experience.

The evidences of old ulceration in the stomach are at times difficult to discover. A thin, fibrous adhesion, a little crumpling of the surface, or a whitish blot on the serous coat may be all that is left of a patch of ulceration. When the stomach is pinched up between the fingers, a little local thickening may be felt, or the mucous membrane may not, as it should, roll away from the muscular coat on gentle pressure. If in performing gastro-enterostomy the needle has to be passed through the stomach wall at the margin of an old ulcer, the different and greatly increased resistance to

its passage is ample evidence of the change that has taken place. Inveterate dyspepsia is, in itself, an ample warrant for surgical treatment. Cases are within the experience of all in which prolonged medicinal treatment, most thoroughly and carefully supervised, proves ineffective, or, if temporarily beneficial, is powerless to ward off the recurrence of dyspepsia. In such cases, be the physical signs what they may, an operation is desirable, and in my experience abundant justification for it will almost always be found when the stomach comes to be examined.

There are few beings so abjectly miserable as those who are the victims of intractable dyspepsia. The meal-time, which should be a delight, is a time of despair and foreboding. The keen relish of good food, which the man in physical health should appreciate, is a joy unknown or long forgotten to the dyspeptic. A patient who has misery written in every wrinkle of a thin haggard face, who by reason of long suffering and bitter experience has felt compelled to abandon first one dish and then another, till fluids alone can be taken, and these not always with impunity; a patient, to say the truth, whose life becomes embittered by the pangs of a suffering which he must inflict upon himself,—this patient will find, if a gastro-enterostomy be done for the chronic ulcer which is the source of all his trouble, that his return to health and appetite is at first almost beyond belief.

Not a few of the patients upon whom I have operated have almost declined, at the first, to take solid food, vegetables, puddings, pastry, and so forth that I have ordered them. And when the meal has been taken haltingly and with grave doubt, a genuine surprise is expressed that no disablement has followed. Indeed, I do not know any operation in surgery which gives better results, which gives more complete satisfaction both to the patient and to his surgeon, than gastro-enterostomy for chronic ulcer of the stomach.

## OPERATIVE TREATMENT.

In operating upon chronic ulcer of the stomach I always perform gastro-enterostomy. It matters not where the ulcer is placed, a gastro-enterostomy will relieve the symptoms completely and permanently and will permit of the sound healing of the ulcer.

This fact, I submit, is placed beyond dispute by the series of cases I am able to record.

At first sight it might appear desirable on all occasions, or at all times when possible, to excise the ulcer. Such a course is entirely unnecessary; moreover, it is futile. For I have already pointed out that gastric ulcer is rarely solitary. If two ulcers are found, therefore, or more than two, it is not always possible to say, even by close examination, which of the two is chiefly at fault. To excise all the ulcers—for I have seen a stomach so scarred that the ulcers seemed universal—is quite out of the question unless a partial gastrectomy is performed. But if the chief offending ulcer be excised, gastro-enterostomy would still, in my judgment, be necessary, for among the many cases of excision of ulcer which are recorded there is not infrequent mention of little or no permanent improvement. In all cases, therefore, I submit, gastro-enterostomy, and gastro-enterostomy alone, should be performed. Excision is unnecessary, often impossible, always insufficient; and is, therefore, not to be commended.

On three occasions I have performed pyloroplasty. The operation is one which, both from its ingenuity and its immediate success, appeals strongly to the surgeon. It is, however, unreliable, a return of the symptoms being not seldom observed. Of my three patients, one remains perfectly well; the second is better, but is certainly not in such good health as the average case of gastro-enterostomy; the third showed a speedy return of all the symptoms, and I then performed gastro-enterostomy with a perfectly satisfactory result. In this last case and in others which I have seen the return of the symptoms seemed to be due in part to a narrowing at the site of the pyloroplasty, and in part to the formation of widespread and tough adhesions around the pyloric portion of the stomach,—adhesions which have seriously hampered the stomach in its freedom of action. Pyloroplasty is, in my judgment, an uncertain operation, and its results cannot compare with those seen after the operation of gastro-enterostomy.

In the performance of gastro-enterostomy I have made the anastomosis on the anterior and on the posterior surface, and I have used the Murphy button and Laplace's forceps as aids to the operation. I wish to speak gratefully of the help I have received

from these instruments; but the greatest service they have rendered me is to convince me that they are entirely unnecessary. No better anastomosis is possible than that made with the simple suture, none is so safe, none so adaptable, and so far as speed is concerned I am content to abide the decision of the timekeeper. With the simple suture a gastro-enterostomy rarely takes, from the beginning of the incision to the last skin suture, more than thirty minutes, and I have once completed the operation in seventeen minutes. I mention these times because I think the question of pace is important. Speed is essential, haste is often disastrous; the two should be distinguished. Speed should be the achievement, not the aim, of an operator. His work must be thoroughly done; but being so done, then the quicker it is done the better. I maintain that no time is saved by any mechanical appliances, and the operation is with their aid less perfect than it should be. I know the view which is held as to the Murphy button in America, and I have nothing but praise for the great ingenuity displayed in its making. But not the most ardent will say that the Murphy button *never* courts disaster. I have seen two patients operated upon for intestinal obstruction caused by a Murphy button used for gastro-enterostomy; in one case the button had remained for six years. I have myself lost one patient from perforation of a button used in the performance of ileo-sigmoidostomy, three weeks after the operation. Now, by the method of suture which I adopt for all forms of intestinal and gastric anastomoses, there is no possibility—I speak positively—of present failure or of future mechanical disaster. The suture line has not leaked in one of my cases; the anastomosis is perfection. In one case of ileo-sigmoidostomy performed in acute obstruction due to cancer in the splenic flexure the patient died at the end of twenty-three and one-half hours. The anastomotic line was closed with the most minute perfection. I claim for the method that it is simple, speedy, applicable to all forms of anastomosis (and therefore time-saving in each, for the operator is quicker in a method he knows well), and is not open to the objection that future troubles are, at the least, possible.

The following are the steps of the operation of gastro-enterostomy:

The abdomen is opened to the right of the middle line, and the fibers of the rectus are split. On opening the peritoneum a complete examination of the whole stomach and duodenum is made. The importance of this cannot be over-emphasized. A constriction in the body or toward the cardiac end may be most readily overlooked when, as is not uncommonly the case, a marked constriction at the pylorus, seen at once, is ample to account for all the symptoms. Cases of hour-glass stomach which have been overlooked at the operation, and a futile anastomosis made between the pyloric pouch and the jejunum, are recorded by several distinguished operators, and the mistake is an easy one to make unless one is determined to examine the whole of the stomach in every case. The importance of this examination of the whole of the stomach has recently received additional emphasis from the observation of a case upon which I operated a few months ago. I had diagnosed hour-glass stomach, and, opening the abdomen, a perfect bilocular stomach at once was exposed. After demonstrating this I remarked that I always liked to see quite up to the cardia before beginning my operation, and, proceeding in the examination, there was revealed another constriction and another loculus. There were, in fact, two constrictions and three loculi in the stomach—a trifid stomach. As soon as the operator is satisfied as to the conditions which exist, the great omentum and transverse colon are lifted out of the abdomen and turned upward over the epigastrium. The under surface of the transverse mesocolon is exposed, and the vascular arch formed mainly by the middle colic artery is seen. A bloodless spot is chosen, a small incision is made in the mesocolon, and the finger is passed into the lesser sac. The opening in the mesocolon is then gradually enlarged by stretching and tearing until all the fingers can be passed through it. It is very rarely necessary to ligate any vessel. The hand of an assistant now makes the posterior surface of the stomach present at this opening (see Fig. 2), and the surgeon grasps the stomach and pulls it well through. A fold of the stomach, about three inches in length, is now seized with a Doyen's clamp. The clamp is applied in such a way that the portion of the stomach embraced by it extends from the greater curvature obliquely upward to the lesser curvature and toward the cardia (see Fig. 3). The duodeno-

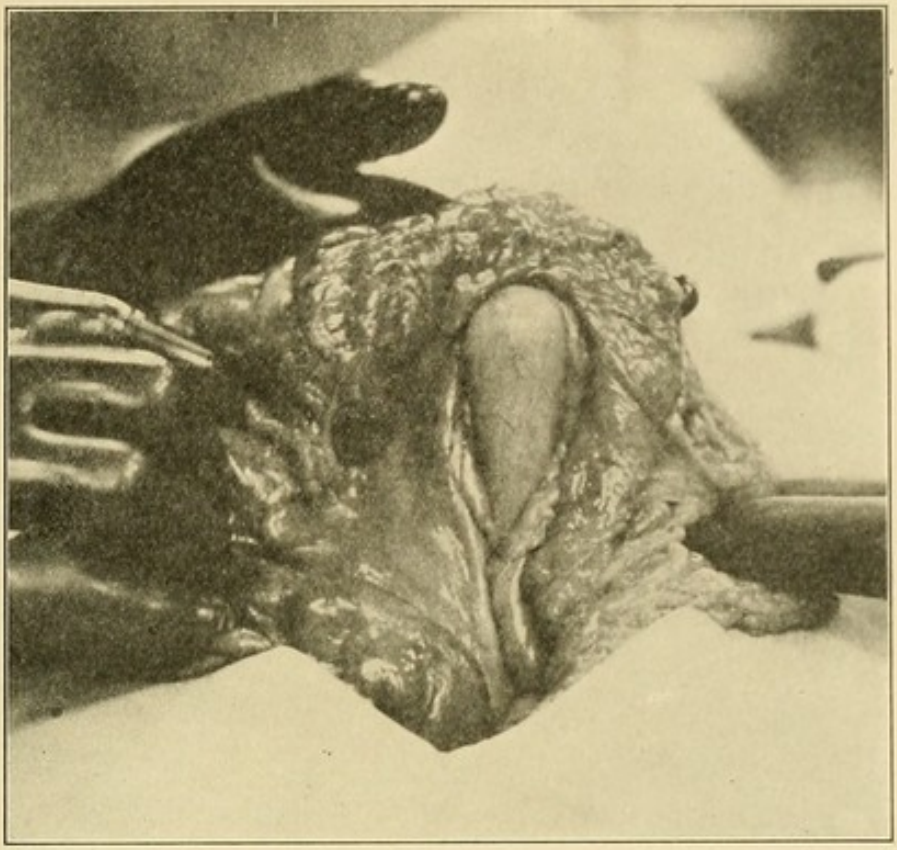

Fig. 2.—Showing the posterior surface of the stomach protruding through the aperture made in the transverse mesocolon.

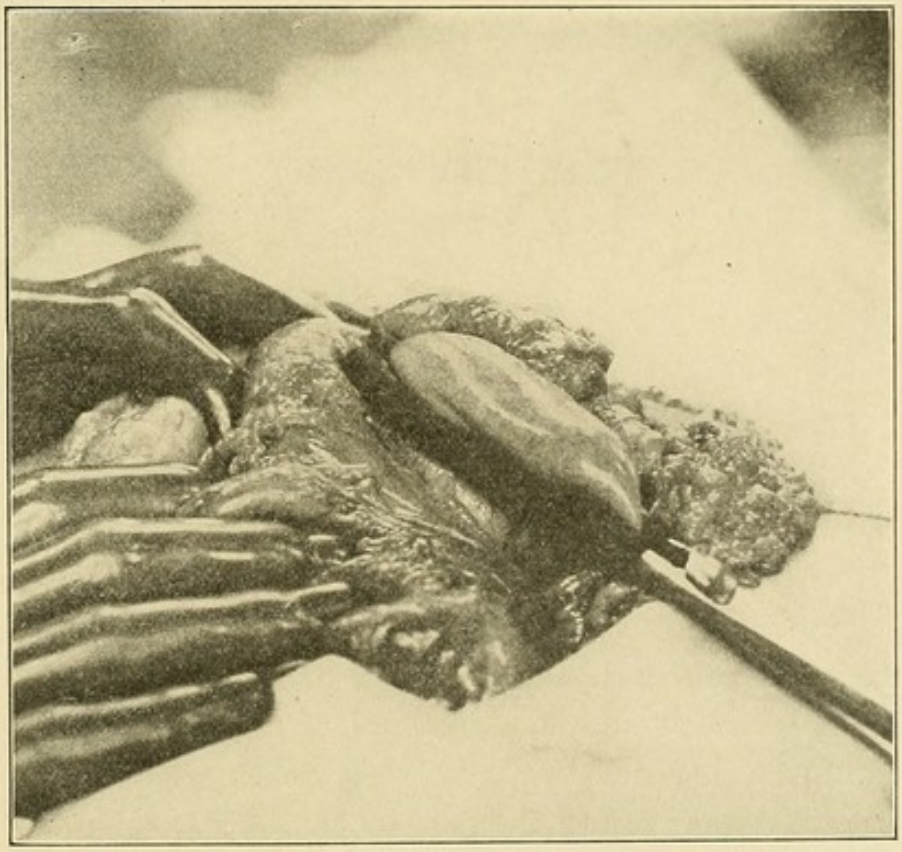

Fig. 3.—Showing the oblique application of the clamp to the stomach.

jejunal angle is now sought, and readily found by sweeping the finger along the under surface of the root of the transverse mesocolon to the left of the spine. The jejunum is then brought to the surface, and a portion of it, about nine inches from the angle, is clamped in a second pair of Doyen's forceps. The two clamps now lie side by side on the abdominal wall, and the portions of stomach and jejunum to be anastomosed are well outside the abdomen, embraced by the clamps. The whole operation area is now covered with gauze wrung out of hot sterile salt solution, the clamps alone remaining visible (Fig. 4). A continuous

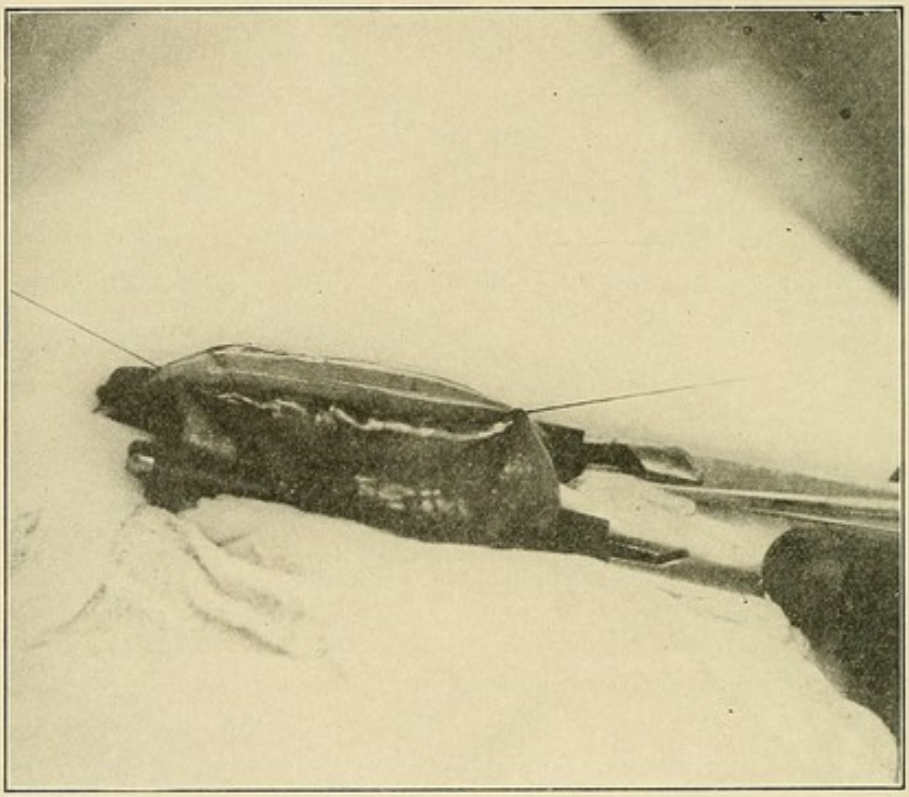

Fig. 4.—Showing the two clamps in position, and the first suture.

suture is then introduced uniting the serous and subserous coats of the stomach and jejunum. The stitch is commenced at the left end of the portions of gut inclosed in the clamp, and ends at the right. The length of the sutured line should be at least two inches. In front of this line an incision is now made into the stomach and jejunum, the serous and muscular layers of each being carefully divided until the mucous membrane is reached. As the cut is made the serous coat retracts and the mucous layer pouts into the incision. An ellipse of the mucous membrane is now excised from both

stomach and jejunum, the portion removed being about one and three-fourths inches in length and half an inch in breadth at the center. The stomach mucosa shows a marked tendency to retract; it is therefore seized with a pair of miniature vulsella on each side. No vessels are ligated. The inner suture is now introduced. It embraces all the coats of the stomach and jejunum, and the

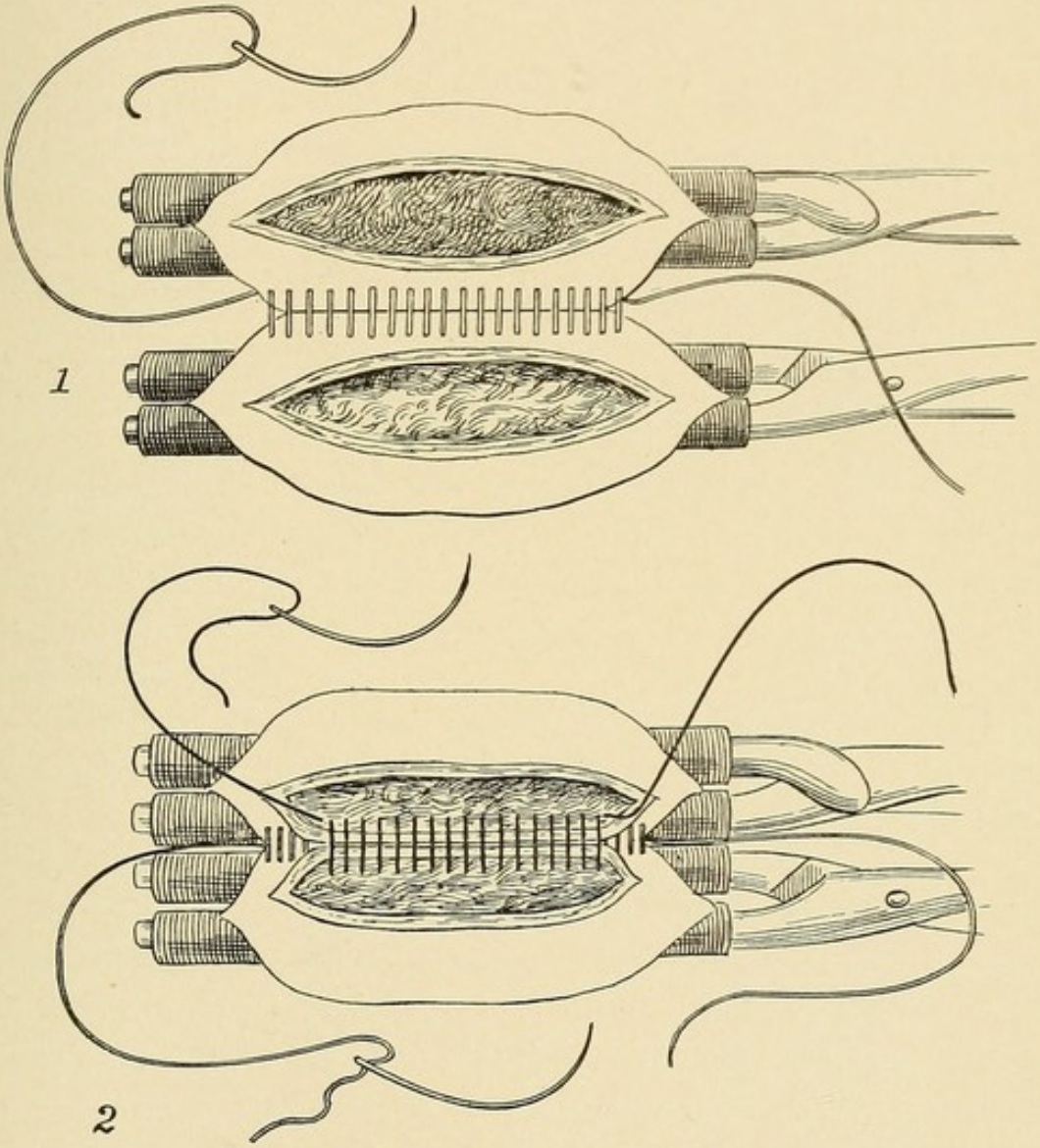


Fig. 5.—Showing the method of suture.

individual stitches are placed close together and drawn fairly tight so as to constrict all vessels in the cut edges. The suture begins at the same point as the outer one, and is continued without interruption all around the incision to the starting-point, where the ends are tied and cut short. It will be found that there is no need to

interrupt the stitch at any point, for there is no tendency on the part of the sutured edges to pucker when the stitch is drawn tight. The clamps are now removed from both the stomach and the jejunum to see if any bleeding point is made manifest. Very rarely—about once in ten cases—a separate stitch at a bleeding

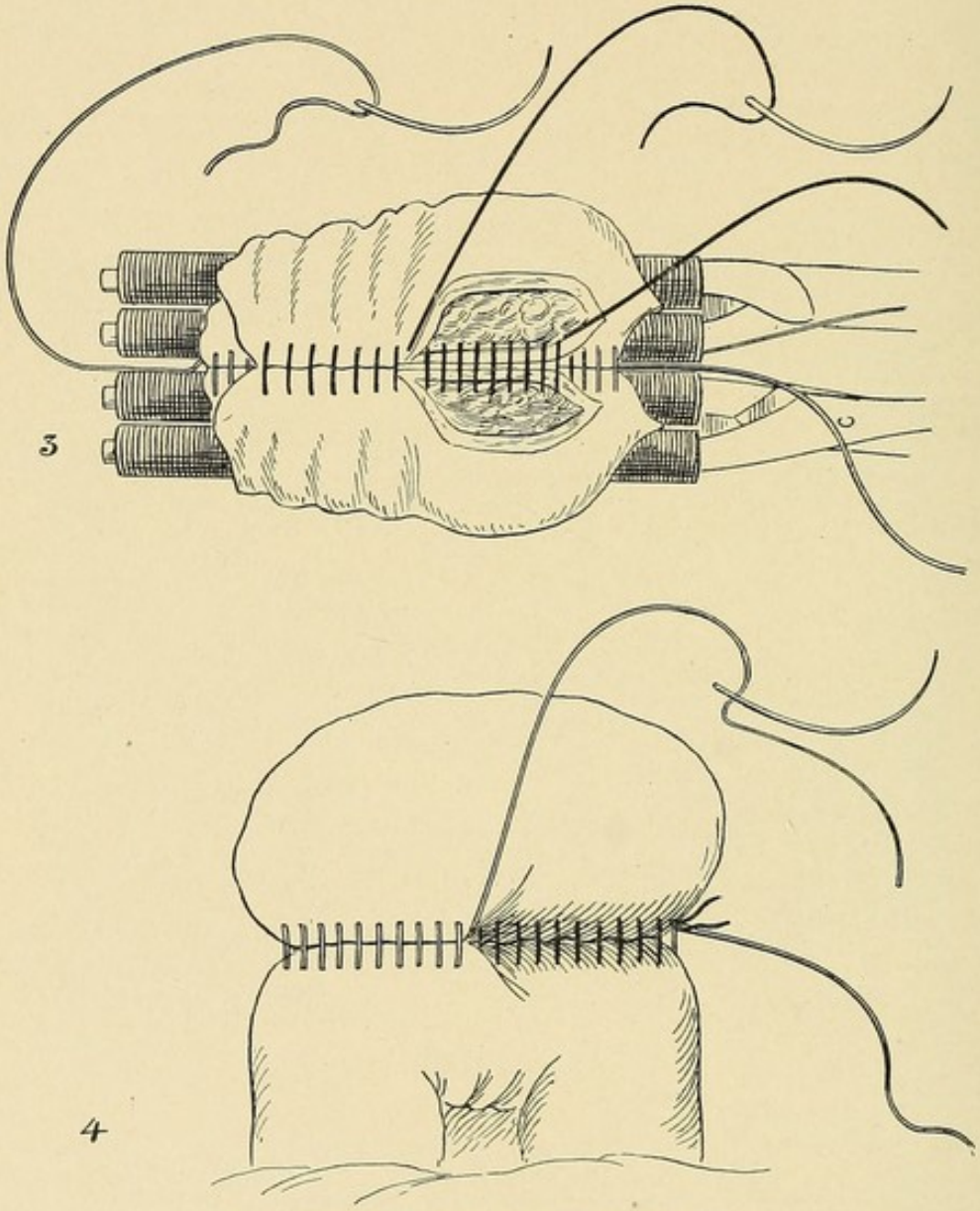


Fig. 6.—Showing the method of suture.

point is necessary. The outer suture is now reassumed and continued around to its starting-point, being taken through the serous coat about one-sixth of an inch in front of the inner suture. This outer stitch is also continuous throughout; when completed, the ends are tied and cut short, as with the inner stitch. There are

thus two suture lines surrounding the anastomotic opening: an inner, hemostatic, which includes all the layers of the gut; and an outer, approximating, which takes up only the serous and subserous coats. For both stitches I use thin Pagenstecher thread. No sutures are passed through the mesocolon and stomach. The gut is lightly wiped over with a swab wet in sterile salt solution, the viscera returned within the abdomen, and the parietal wound sutured layer by layer. When the patient is replaced in bed, the head and shoulders are supported by three or four pillows. The operation lasts, from beginning to end, about thirty to thirty-five minutes, but can be shortened by five or ten minutes if the condition of the patient demands it.

In connection with the operation of gastro-enterostomy the following points are worthy of attention:

1. The sterilization of the mouth, stomach, and jejunum. As soon as the patient is admitted for operation the preparation of the mouth is begun; the teeth are cleansed and brushed frequently with some mild antiseptic mouth-wash; all food given is liquid and sterile. The stomach is washed out twice, once about thirty-six hours before the operation, and again about six hours before, with tepid boiled water. Calomel is given forty-eight hours before the operation.

2. Gloves made of thin india-rubber and boiled are worn by the operator, assistants, and nurses.

3. The hands are rinsed in salt solution during the operation; no antiseptic is allowed to touch the peritoneum.

4. Scrupulous care is taken to avoid any possible infection from the stomach or jejunal mucosa. The scissors and clips which touch the mucous membrane are at once laid aside, and not used during the subsequent stages of the operation. As soon as the mucous membrane suture is completed the gut is lightly washed with saline solution, and the hands are then thoroughly well cleansed.

With regard to the after-treatment there is but little to say; nutrient enemata are given every four hours, and the bowel is washed out every morning with a pint of hot water; no fluid is given by the mouth for twelve hours, or until the ether sickness is over; then water in teaspoonful doses every fifteen minutes is

given, and the quantity increased and the intervals lessened if sickness is not aroused. At the end of forty-eight hours milk and a little pudding, soups, and such like are given. By the eighth day fish and minced chicken are taken, and in less than a fortnight solid food will be relished. The patient generally requires a caution not to overeat during the first month or two, for often the appetite is ravenous.

## 4. HOUR-GLASS STOMACH.

By hour-glass stomach (bilocular stomach ; hour-glass contraction of the stomach) is understood that condition in which the stomach is divided into two compartments by the narrowing of the viscus at or near its center. The two loculi so formed may

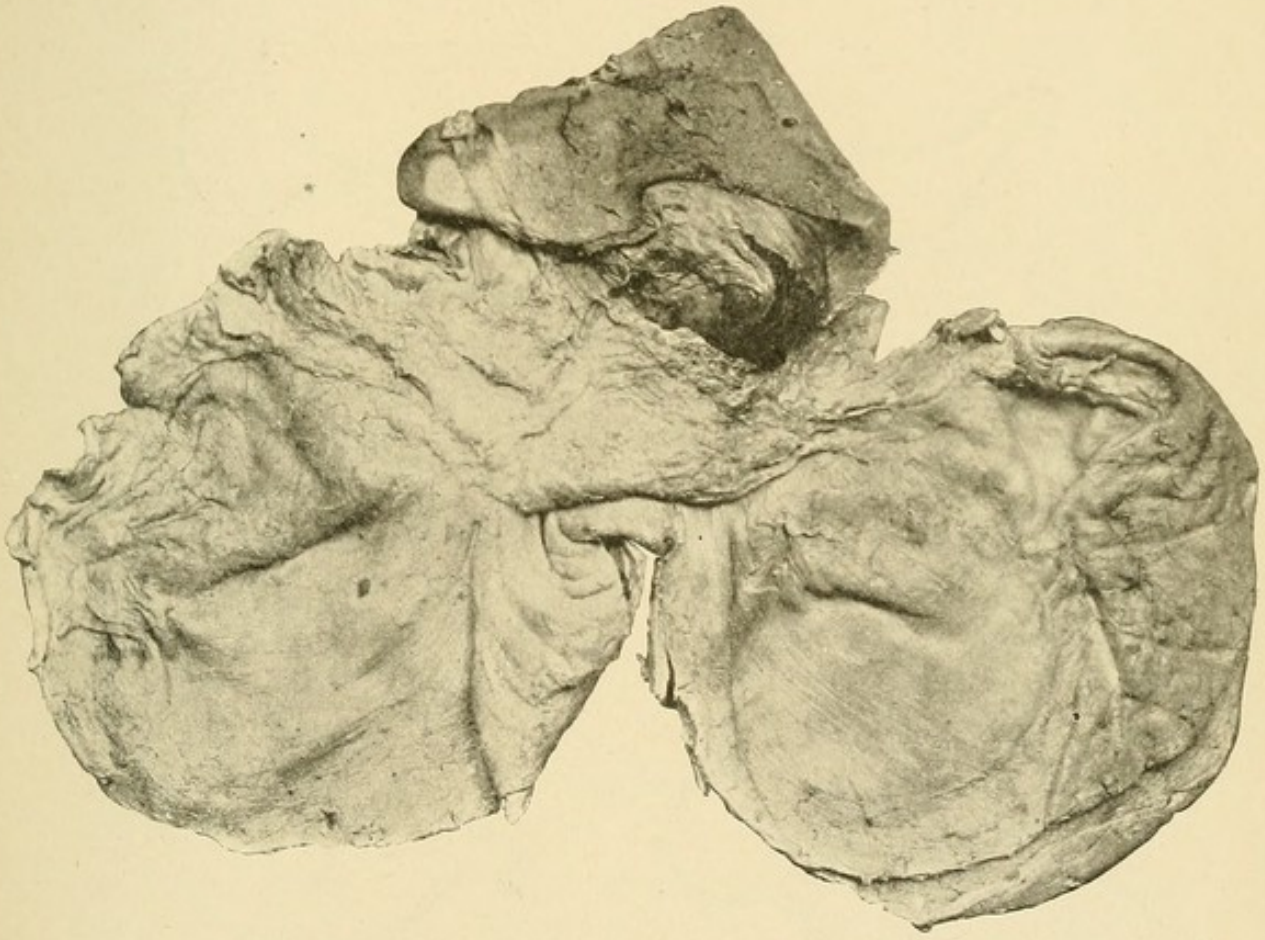

Fig. 7.—Hour-glass stomach—found post mortem.

be almost equal in size, or one, generally the cardiac pouch, may be very much larger than the other. In one instance, Case 15, I have seen the stomach divided into three pouches ; and in another, Case 14, a condition of hour-glass duodenum was associated with hour-glass stomach, so that four pouches, two larger in the stomach, two smaller in the duodenum, were seen. The isthmus con-

necting the two parts of the stomach is generally found at or near the middle of the viscus, but owing to stasis of food the cardiac complement becomes dilated and is then much larger, thicker, and more capacious than the pyloric. The pyloric pouch is, however, not seldom dilated also, and in such circumstances a pyloric or duodenal stenosis will also be found.

## PATHOGENY.

Hour-glass stomach is usually described as being "congenital" and "acquired." Of these forms, the congenital is said to

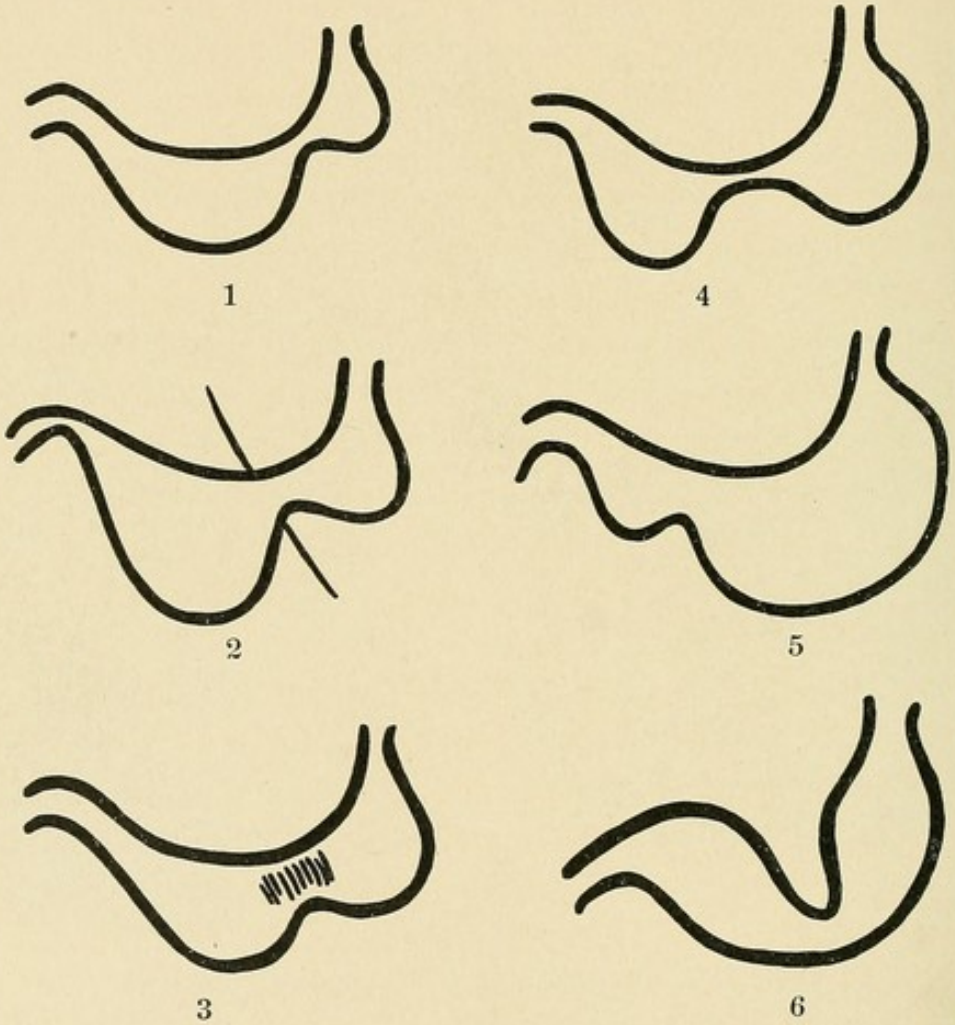


Fig. 8.—Types of hour-glass stomach: 1, Obstruction near cardiac end; 2, cardiac pouch concealed by adhesions; 3, growth in body of stomach; 4, two pouches connected by a narrow tube; 5, cardiac pouch largely dilated; 6, lesser curvature pulled down toward the greater.

be more frequent. Thus, Fenwick in his work writes: "In about 45 per cent. of the cases which have been recorded neither ulcer

nor scar could be detected in the stomach, while in the great majority of cases where an ulcer was present it was obviously of more recent formation than the stricture;" and, again, "that the deformity is a rare result of ulceration is proved by the fact that only one case of the kind is mentioned in the records of the London Hospital for forty years, whereas several instances of the congenital form of the disease were encountered during the same period of time."

Meckel considered that a congenital hour-glass stomach might result from an imperfection of development, and Cruveilhier and others have suggested that the sacculation is an instance of atavism, and that there is an analogy between such a deformity and the normal bifid stomach of certain rodents and the pouched stomachs of ruminants.

On examination of specimens of hour-glass stomach there can occasionally be seen two crossing bundles of muscular fibers on each surface of the organ. These were first noticed by Mariotti, but were more fully described by Saake. The bundles are generally half an inch or more in width, and cross at the point of narrowing in the stomach. Traced from the upper side of the cardiac complement, a bundle is seen to pass to the lower side of the pyloric, and from the lower side of the cardiac complement to the upper part of the pyloric, the fibers crossing like the widely opened blades of a pair of scissors. It has been suggested that these outstanding bands of muscle by their contraction determine the hour-glass form of the stomach, and their existence is held to be proof of the "congenital" origin of the deformity. In the only example I have seen of this muscular arrangement the hour-glass stomach was clearly the result of an ulcer, whose edges were immensely thickened and whose base had perforated. In this case the bundles of fibers followed the lines of puckering produced by the contraction of the ulcer, and were therefore clearly the result, and not the cause, of the deformity.

Cumston and other writers have said that in congenital hour-glass stomach the two pouches are connected by a tube or cylinder showing no scar of ulceration, and free externally from all adhesions. One such case I have dealt with by operation. I slit up the channel connecting the two sacs, and found a perfect example

of "bridle" stricture, the result of healing in an ulcer which from the mucous surface was easily seen and felt.

An example of congenital hour-glass stomach is said to have been recorded by Sandifort; the specimen was obtained from a fetus. But the appearance of hour-glass deformity may be mimicked with remarkable accuracy by a condition of dilatation of the stomach and of the upper part of the duodenum, as the result of a congenital narrowing of the duodenum at or near the bile papilla. Such a case is recorded by Wyss. Sandifort's case is certainly open to question, for the description is not convincing.

In all the recorded examples of hour-glass stomach where a full examination of the viscus had been made, ulceration has been found. For those who believe that the deformity is congenital the theory that the ulcer is secondary is sufficient. Thus, Cumston writes: "These ulcers are secondary, and are probably produced by the pressure of the food passing through the strictured part of the organ."

Roger Williams, in 1883, described ten examples of "congenital" contraction of the stomach. The account of one of the cases is based on the examination of a wax model; of another, on the inspection of an "inflated dried" specimen; and of a third, on the appearance of a dried stuffed specimen. It is doubtful whether one of the examples can be accepted as an hour-glass stomach. In all the others pathologic conditions—ulceration, puckering, thickening, or adhesions—were found.

Hochenegg, Carrington, Maier, Saake, and many other writers who describe their examples as "congenital" mention thickening, old ulceration, adhesion to the pancreas or to the abdominal wall, localized perforation, and other conditions which are indubitably the result of chronic ulcer of the stomach. Doyen, in his work on the diseases of the stomach and duodenum, refers to a case in which, at the isthmus of the stomach, an adhesion to the anterior abdominal wall was found; on breaking through this, a gastric fistula was exposed, showing unmistakably that an ulcer had been present, which had been prevented from perforating into the peritoneal cavity only by the anchoring of the organ to the anterior abdominal wall. This is said to be "congenital."

Mazotti relates a case of "congenital" hour-glass stomach in

a woman of fifty; he believes the deformity to be due to an unusual development of the transverse muscular fibers in a certain part of the wall of the viscus. Without entering in detail into this discussion, I may say that I have very carefully considered the question as to the existence of hour-glass stomach as a congenital deformity, examining all the specimens that I could find, and reading carefully the records of, I believe, all the published cases; but I remain confident in my belief that there is no evidence whatever which will establish the claim of those who assert that the disease is often congenital in origin. Since I first threw doubts upon the congenital origin of many of the cases of hour-glass stomach, and showed that in almost all of the cases obvious evidence of old ulceration could be found, several investigators have supported my conclusion by observations made during the course of operation or on post-mortem examination. There is, indeed, no inherent improbability in the existence of congenital hour-glass stomach, but it lacks proof.

Acquired hour-glass stomach may be caused by: (1) Perigastric adhesions; (2) ulcer, with local perforation and anchoring to the anterior abdominal wall; (3) chronic ulcer, generally at or near the middle of the organ; (4) malignant disease.

*1. Perigastric adhesions* may result from many causes—gastric ulcer, old tuberculous peritonitis, inflammatory affections of the gall-bladder, and so forth. In rare instances these adhesions may be the sole cause of the partition of the stomach; in many instances they are no more than contributing causes. They were well seen in a case related by Cumston.

*2. Ulcer with local perforation and anchoring of the stomach to the anterior abdominal wall.* This was the condition I found in my first case. It results from gradual deepening of a chronic ulcer. As the ulcer approaches the serous coat of the stomach, a few adhesions form, binding the viscus to the anterior abdominal wall, preventing the bursting of the ulcer into the general peritoneal cavity. If the ulcer be on the posterior surface, a soldering to the pancreas may result, as in one case I have recently seen. When the stomach is anchored in its middle, the pouches on each side, but more especially on the cardiac side, show a tendency to sagging, and this, with the cicatricial contraction taking place in

the ulcer, results in hour-glass form of the stomach. In one of my cases a malignant mass in the anterior wall had formed an extensive adhesion to the body-wall. Doyen, Steffan, and Finney have recorded similar examples.

In three recorded cases an ulcer at the isthmus of an hour-glass stomach has perforated into the peritoneum and caused death. The first case was related by Siewers, the second by my friend Mr. W. H. Brown, and the third by Thomsen (Hospitals tidende 1901, N. 23, Kopenhagen).

*3. Chronic ulcer.* A chronic ulcer of the stomach is character-

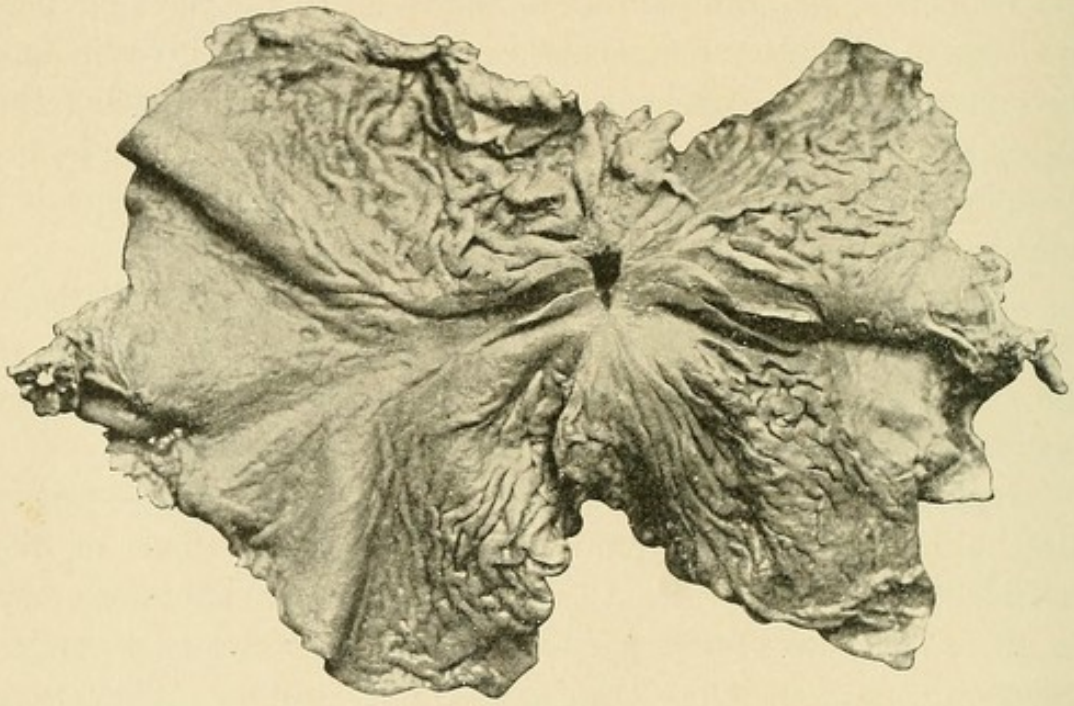

Fig. 9.—Hour-glass stomach showing perforation (W. H. Brown's case).

ized by the thickening and induration at its base. In the healing of such an ulcer, especially if large in size or circular, a considerable amount of contraction will necessarily take place, and a high degree of narrowing of the stomach may result. There is, I believe, in addition to the cicatricial contraction, another factor of chief importance in determining the narrowing of the organ. I refer to spasm. On several occasions during the last two years, when operating for chronic ulcer, I have watched the stomach intently for several minutes, and have seen the onset, the acme, and the gradual relaxation of a spasmodic muscular contraction in its

walls. Quite gradually the stomach narrows, and the wall becomes thicker and almost white in color; when taken between the fingers the contracted area feels like a solid tumor. The spasm may be so marked as to prevent a finger being invaginated through the segment affected. The appearance presented is very striking. I have seen it in the body of the stomach and at the pylorus. As slowly as it comes on, the spasm quietly relaxes, and the stomach assumes its usual form. In one patient I watched four such spasmodic seizures at the pylorus in a few minutes, and the tumor formed by the tightly contracted muscle was so large that in a very thin subject it should have been felt on palpation of the abdomen. Such constantly recurring attacks of spasm must lead to an hypertrophy of the circular muscular fibers, and this thickening, together with the cicatricial contraction and the induration of the ulcer, will amply account for the extreme narrowing of the stomach cavity, with the dense thickening of the walls met with in many of the examples recorded.

The extent to which spasmodic contraction, invoked by ulceration, is responsible for the narrowing found in hour-glass stomach (and congenital stenosis) is not capable of being measured; but my observation of the cases I have seen during the last two years makes me ready to believe that it is not inconsiderable.

Klein has recorded one example of hour-glass stomach resulting from the contraction of an ulcer which had been caused by the drinking of hydrochloric acid with suicidal intent. Syphilis of the stomach may result in ulcer or gumma and in consecutive warping of the viscus.

The amount of induration found around a chronic ulcer may be so considerable, and its density so marked, that a mistaken diagnosis of malignant disease of the stomach may be made. This happened in Case 11 of my list. A large, densely hard, immovable mass, adherent to the pancreas, was found in the stomach walls between the two loculi. The appearance of malignant disease was accurately simulated. I could not remove the mass, and could not reach the cardiac pouch with sufficient ease to allow me to perform a gastro-enterostomy, and I was therefore only able to dilate the constriction between the two pouches. After considerable pressure I succeeded in invaginating my little finger through

the isthmus, and slowly dilated it until three fingers would pass through. I hoped by so doing to lessen the distress of vomiting, which had been almost continuous. The patient speedily recovered, and now, after two years, is perfectly well; she has gained $2\frac{1}{2}$ stones in weight, is ruddy and healthy in appearance, and the tumor, readily palpable before the operation, has entirely disappeared.

One point which is, I believe, deserving of especial emphasis is the frequency with which, in cases of hour-glass stomach due to chronic ulcer, a narrowing of the pylorus is also found. The constriction in the middle of the stomach hinders the passage of food from the cardiac to the pyloric pouch; the narrowing at the pylorus makes difficult the emptying of the pyloric sac, which, in consequence, undergoes dilatation. This double constriction is an illustration of the fact I have verified in operations upon the stomach—the frequency of multiple ulcers in the stomach, or in the duodenum, or in both. If the cardiac loculus alone is obstructed, the pylorus being free, the walls of the former are much thicker than those of the latter. Lunnemann, in such a case, found the circular muscular fibers 2 to 2.5 mm. thick on the cardiac side, and only 1 to 1.5 mm. on the pyloric. It is possible that the contraction found at the pylorus may be the result of a long-continued spasm, set up by the ulcer whose healing has caused the hour-glass shape of the stomach. Frequent spasm would cause hypertrophy of the muscular coats, and fibrous transformation would occur in the over-developed muscle. In one case under my care a double constriction had been formed in the stomach and three pouches had thereby resulted. This is the only recorded example of trifid stomach due to ulceration.

*4. Cancer.* Cancer as a cause of hour-glass stomach is not infrequent. Three specimens of this kind are in the Museum of the Royal College of Surgeons in London. I have operated upon two cases. In the first the malignant disease, beginning rather nearer the cardiac than the pyloric end of the stomach, had infiltrated the greater part of the organ, and had resulted in a condition of "leather bottle" stomach. In the second a large chronic ulcer, with carcinoma implanted upon it—"ulcus carcinomatosum"—was found.

## SYMPTOMS OF HOUR-GLASS STOMACH.

An hour-glass stomach can be diagnosed with certainty if attention be paid to a certain combination of symptoms. In my first six cases only one was diagnosed; in my last eight cases six were diagnosed with certainty; in one of these the diagnosis was made by the medical attendant, Dr. M'Gregor Young, before I was asked by him to see the patient. The symptoms will naturally vary according to the position of the constriction in the stomach: if this lies near the cardiac orifice, the clinical picture will resemble that given by esophageal obstruction low down; if near the pyloric orifice, the symptoms are those of dilated stomach. But wherever the narrowing may be, attention to the following signs will, in almost every case, enable a diagnosis to be made with confidence:

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 ounces be used, only 24 can be made to return, as in Dr. M'Gregor Young's case already mentioned. Wölfler, who called attention to this sign, said that some fluid seemed to disappear "as though it had 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 palpa-

tion 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 distention with $CO_2$. 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 inches 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 twenty or thirty 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 $CO_2$. In Case 10 in my list, the two pouches, with a hard, as I thought, malignant, mass between them, could readily be seen. When both pouches were distended with $CO_2$, alternate pressure upon them showed unmistakably that they communicated through a very narrow orifice, for the one could be emptied slowly into the other, and the

fluid could be felt to ripple gently through. The diagnosis in such a case is simplicity itself. In Case 8 a distinct notch was seen at the lower border of the inflated stomach.

8. Ewald has called attention to two signs which he considers of value in establishing a diagnosis. When the stomach is filled with water and examined by gastro-diaphany, the transillumination is seen only in the cardiac pouch; the pyloric pouch remains dark.

9. The deglutable india-rubber bag of Turck and Hemmeter is passed and distended. The bulging caused thereby is limited to the cardiac pouch, which lies to the left of the middle line.

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. The fluid used for the washing must be carefully measured before use; the tube is then passed, and the stomach emptied, the contents set aside in a separate dish, and the washing commenced. All the fluid now returning is collected in a separate vessel and carefully measured. The two signs of Ewald are of little importance; a correct diagnosis can always be made without them.

## DIFFERENTIAL DIAGNOSIS.

The two conditions for which an hour-glass stomach is liable to be mistaken are obstruction in the lower part of the esophagus and pyloric stenosis. If the constriction in the stomach is within an inch or two of the cardiac orifice, the upper loculus of the stomach will be very small in size, and capable, therefore, of holding only small quantities of food. Food, when swallowed, may be regurgitated within a few minutes almost unaltered, and the patient may tell the same story of difficulty in "getting the food down" as is told by one whose esophagus is obstructed. A correct diagnosis can be made by introducing the esophageal bougie; if the bougie passes over 16 inches from the teeth, the obstruction does not lie in the stomach.

If the constriction be near the pylorus, the cardiac complement will be dilated, and will present the same appearance and signs as a dilated stomach. Wölfler's two signs (1 and 2 in the list given) will generally enable a correct diagnosis to be achieved.

If the obstruction should lie at any point between the two mentioned, there should be no difficulty in making a correct diagnosis.

## TREATMENT.

The treatment of hour-glass stomach may be beset with difficulties. If the stricture is near the cardiac, or if the cardiac complement be bound up in adhesions, there may be great mechanical hindrance to the performance of any operation. When the abdomen is opened, a thorough examination of the whole stomach must first be made. The dilated pyloric sac may so completely resemble the whole stomach as to lead to the performance of a gastro-enterostomy between it and a loop of the jejunum. Several cases are recorded in which this mistake has been made, and it is therefore necessary to emphasize the importance of an examination of the whole stomach up to the cardiac orifice in every case, no matter how obvious the diagnosis of "dilated stomach" may have seemed.

In one case, that in which a "trifid" stomach was found, I had diagnosed hour-glass stomach after eliciting several of the signs mentioned. On opening the abdomen I exposed at once a perfect example of bilocular stomach; the two pouches and the intervening constriction were well seen. After completing my demonstration of this I remarked to my assistant that I never began a stomach anastomosis until I had seen all the viscus, quite up to the cardiac end. On continuing my examination in this direction I exposed a second constriction and a pouch. There were then three pouches and two constrictions.

In many cases of hour-glass stomach no single operation will suffice to relieve the symptoms. This is due to the fact, already mentioned, that where a stricture is present in the body of the stomach, a second stricture near the pylorus may also be found. If there be any dilatation of the pyloric complement, a constriction at the pylorus or in the duodenum will certainly be found. This dual stenosis, which has not received adequate attention from any writer, accounts for the lack of permanent improvement seen in many of the recorded cases. If in such circumstances a gastro-enterostomy is performed between the cardiac pouch and the

jejunum, the pyloric pouch becomes a reservoir incapable of efficient emptying, wherein food lodges and becomes sour. Symptoms of stasis are then observed—acid, bitter eructations, occasional vomiting, a sense of heaviness and heat at the epigastrium, and distaste for food—and, as in a case recorded by Terrier, a second operation is necessary. If a gastroplasty is performed, the stomach cannot empty itself because of the pyloric stenosis, and the symptoms are unrelieved. Such a condition of double stenosis can therefore be adequately treated only by the performance of two operations at the same time—gastroplasty and pyloroplasty; gastroplasty and gastro-enterostomy from the pyloric pouch; gastro-gastrostomy and gastro-enterostomy; or a double gastro-enterostomy, a loop of jejunum being opened at two points, at the upper into the cardiac pouch, at the lower into the pyloric.

In operating upon hour-glass stomachs I have noticed on several occasions that the pyloric pouch was partially filled with a dirty-looking and slightly offensive fluid. In washing out the stomach before operation, it is obvious that when the stricture is narrow the cardiac pouch only is cleansed. In the pyloric pouch food remains stagnant for lengthy periods and may become foul, putrid, evil-smelling. Before opening the pyloric sac for the purposes of anastomosis, it may be necessary to empty it of its contents through a needle to which is attached a long tube. Leakage from the pouch should be prevented, and any swabs used to dry the surface when cut should be instantly discarded.

The following are the operations that may be practised:

1. Gastroplasty.
2. Gastro-gastrostomy or gastro-anastomosis.
3. Either of the foregoing, with gastro-enterostomy from the pyloric pouch, in cases of dual stenosis.
4. Gastro-enterostomy from the cardiac pouch, when the pyloric pouch is so small that it can be ignored.
5. Gastro-enterostomy from both pouches.
6. Partial gastrectomy.

The operation selected will necessarily depend upon the condition which is found. Thus I performed:—

Gastroplasty alone in Cases 1, 2, 3, 5, 11.

Gastro-enterostomy alone in Cases 6, 7, 8, 9.

Gastroplasty and gastro-enterostomy in Cases 12, 13.

Gastro-gastrostomy alone in Case 4.

Gastro-gastrostomy and gastro-enterostomy in Cases 14, 15.

Partial gastrectomy is the operation of choice in cases of malignant stricture in the body of the stomach.

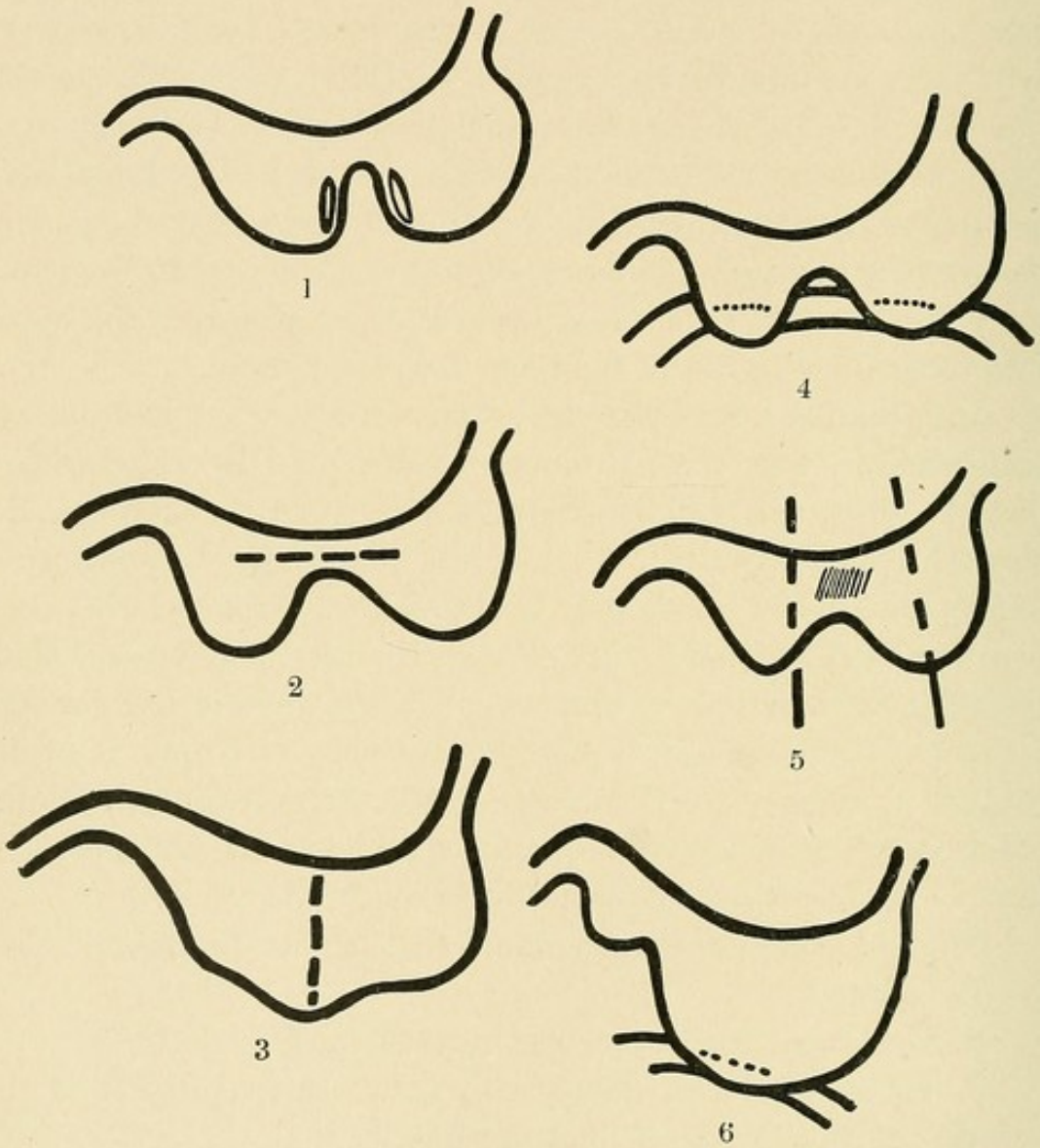


Fig. 10.—Diagrams showing the operations for hour-glass stomach : 1, Gastro-gastrostomy ; 2, 3, gastroplasty ; 4, double gastro-enterostomy ; 5, partial gastrectomy ; 6, gastro-enterostomy from the cardiac pouch.

Gastroplasty was first performed by Bardeleben in 1889, later by Kruckenberg, Doyen, and others.

Gastro-gastrostomy was first performed by Wölfler in 1894. In 1895 Sedgwick Watson performed a gastro-anastomosis by folding the pyloric pouch over the cardiac pouch, with the constriction as a hinge, and uniting the apposed surfaces.

The cases printed in red in the following tables were operated upon for hemorrhage.

The cases printed in red in the following tables were operated upon for hemorrhage.

# TABLES OF CASES.

| | | | |
|---|---|---|---|
| TABLE I. | Perforating Ulcer. | 12 cases. | 6 recoveries. |
| TABLE II. | Gastro-enterostomy. | 69 cases. | 1 death. |
| TABLE III. | Pyloroplasty. | 3 cases. | 0 death. |
| TABLE IV. | Hour-glass Stomach. | 15 cases. | 3 deaths. |
| EXCISION OF ULCER. | | 1 case. | Death. |
| GASTROPLICATION. | | 1 case. | Recovery. |

# TABLE I.

## CASES OF PERFORATING GASTRIC AND DUODENAL ULCER.

| Name and Date. | Sex. | Age. | Symptoms and Description. | Condition Found. Operation. | Result. | Remarks. |
|---|---|---|---|---|---|---|
| S. A.<br>April 30, 1897 | F. | 39 | Was admitted with a history of acute onset of severe abdominal pain, chiefly in the epigastric region. There was faintness, followed in about half-an-hour by vomiting; no hematemesis. The abdomen gradually became distended, and the pulse gradually became quicker and feebler. | Abdomen opened and a very small gastric ulcer near lesser curvature found to have perforated. There was free effusion, and some curdled milk was seen in the peritoneum. Suture of ulcer, lavage and drainage. | R. | Infirmary.<br>Time after perforation about 30 hours. |
| M. P.<br>May 22, 1897 | F. | 27 | During last year was under treatment by Dr. Bennett for gastric ulcer. Since then has constantly had dyspepsia, pain in the back and epigastrium, and occasional vomiting, but not recently of blood. On Saturday, May 22d, at 2.30 A. M., suddenly roused from sleep by intense epigastric pain, felt faint and vomited. Collapse continued and soon distention and tenderness; vomiting was persistent. | Abdomen generally distended, upper part especially; very tense pulse, only just perceptible, cold, clammy hands, livid skin. Operation 11.25 P. M. Large perforation, ½ inch in diameter, just below lesser curvature nearer cardia. | D. | Dr. Bennett, Otley.<br>Died 2.40 P. M.<br>Time after perforation 21 hours. |
| R. S.<br>Nov. 16, 1898 | F. | 20 | Was under Dr. Johnstone some months ago for indigestion, with dieting, etc., the symptoms abated. No discomfort recently. On November 18th, 5.30 P. M., while at tea, sudden pain, overwhelming, localized beneath ribs on left side "as though a knife were run in." Abdomen gradually distended. Remained collapsed for several hours, but improved after morphin. No liver dulness. Tenderness over appendix region chiefly. | Operation November 20th, 12 noon. Large ulcer, easily admitting the middle finger about 3 inches from cardia on anterior surface. General peritonitis, large collection of thick turbid fluid and lymph. | D. in 23½ hours. | Dr. Johnstone, Ilkley.<br>Time after perforation about 42 hours. |
| T. H.<br>April 26, 1900 | M. | 44 | Symptoms had been present for 18 months; the chief of them was pain, 2, 3, or 4 hours after food. Blood had been observed when the patient vomited; vomiting was frequent, but irregular. There was no melena. On April 25th, while in the Infirmary, the man became suddenly worse; pain came on acutely in the whole abdomen. Distention and rigidity were soon observed. Collapse was pronounced. Respirations 28, pulse 128. | A diagnosis of perforating ulcer was made and the abdomen opened. The ulcer was found at the beginning of the second part of the duodenum, its diameter was about ¾ inch. After stitching the ulcer up, the gut seemed narrowed to at least half its diameter. A gastro-enterostomy, with the aid of a Murphy button, was therefore performed. The patient never rallied from his collapse. | D. | Dr. Veale, Drighlington.<br>Time after perforation about 26 hours. |

## CASES OF PERFORATING GASTRIC AND DUODENAL ULCER.—(*Continued.*)

| Name and Date. | Sex. | Age. | Symptoms and Description. | Condition Found. Operation. | Result. | Remarks. |
|---|---|---|---|---|---|---|
| M. L.<br>April 12, 1901 | F. | 28 | Symptoms of indigestion for 8 years. On April 11th, was suddenly seized with acute abdominal pain, about 3 hours after breakfast. On admission to the Infirmary she was found to be in very acute pain, the abdomen, especially in the upper half, being much distended and very rigid. The epigastric region was excessively tender. | An ulcer, equal in size to the end of a lead-pencil, found near lesser curvature, toward the cardia. The stitches held imperfectly until taken very wide of the ulcer. To give security, an omental flap was stitched over the ulcer. The early course was satisfactory, but later the temperature ran up, and a subphrenic abscess and multiple suppuration in the abdomen resulted, and the patient died May 7th. | D. | Infirmary.<br>Time after perforation 28 hours. |
| L. T.<br>May 24, 1901 | M. | 23 | Has had symptoms of gastric ulcer for several months. He is a policeman, and has recently been on night duty; frequently has vomited during the night. On morning of May 23, 1901, a sudden acute attack of pain and vomiting when going on duty. He returned to bed, felt ill and cold all day, and at night first sent for a medical man. The abdomen was then distended, rigid and tender; pulse 124, thin and feeble. | An ulcer on the anterior surface, near the pylorus, had perforated. There were masses of lymph between the liver and the stomach. Fluid was found everywhere in the peritoneum. The ulcer was about the size of a sixpence. | D. | Dr. Exley, Leeds.<br>Time after perforation 35 hours.<br>Vomiting of digested blood continued for two days: it was very acid, and caused redness of the cheek and chin. At the post-mortem two other acute ulcers found. |
| T. F.<br>June 18, 1901 | M. | 25 | The patient, a sturdy, robust laborer, stated that for about 4 weeks before admission he had suffered from indigestion and vomiting. On June 18th, while climbing a ladder, was suddenly seized with intense abdominal pain. He was seen at once by a medical man, who happened to be near, and sent to the Infirmary. He was then profoundly collapsed. Breathing quick and short; pulse 128; abdomen rigid and unyielding. A diagnosis of perforated ulcer was made. | A perforation equal in diameter to a No. 8 or 9 catheter was found in the duodenum, 1 inch from the pylorus. The ulcer was stitched and the abdomen cleansed and drained. | R. | Infirmary. Dr. Rowden, Roundhay.<br>Time after perforation 3 hours 50 minutes. |
| R. H.<br>March 13, 1902 | F. | 24 | Was married 8 weeks ago. Had suffered slightly before that from indigestion, but never severely. Thirty-six hours before operation was suddenly seized with acute intolerable pain underneath the left costal margin. There was no vomiting, but faintness and collapse were pronounced. Gradually | An ulcer near the cardia had perforated. The edges for at least an inch round were solid and hard, and stitches cut through when tightly tied. An area of stomach was infolded, and an omental flap stitched like a lid over the line of suture. There | R. | Dr. Bates, Ilkley.<br>Time after perforation about 36 hours. |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | the abdomen began to distend, and the pulse to fail. On examination the abdomen was distended uniformly, and was everywhere tender. In the left upper quadrant, beneath the left rectus, a specially tender area. | were large masses of thick lymph for a few inches round the ulcer. | | |
| I. S.<br><br>April 20, 1902 | F. | 17 | For several weeks had had slight indigestion and epigastric pain, but not in sufficient severity to send her to a doctor. Last night, April 19th, at 9 P. M., a sudden attack of acute epigastric pain. Morphin given. Seen at 7 A. M.; abdomen very rigid and rather tender, especially over gall-bladder. Has vomited once. Pulse 112. Very shallow respiration. | An ulcer perforated on anterior surface of duodenum, about ¾ inch from pylorus. Some fluid above the stomach. Ulcer closed by suture; peritoneum cleansed by wiping with swabs wet with sterile salt solution. No lavage, no drainage. | R. | Infirmary.<br>Time after perforation about 10 hours. |
| Miss E. H.<br><br>October 11, 1902 | F. | 20 | In March, 1901, a very severe attack of hematemesis, afterward symptoms of indigestion, but never severe. She remained anemic for several months. In November, 1901, a second attack of hematemesis; symptoms of indigestion since, up to three months ago. Latterly has been quite well, better than for years, and has suffered no discomforts from food. On October 10th, at 5 P. M., had tea; at 9 P. M. some broth; at 11 P. M., while undressing, sudden attack of pain under the ribs on the left side, "catching her breath." She was coiled up in bed, groaning with pain, and slightly collapsed up to 2 P. M., when morphin was given. She has been comfortable since. Seen at 3 P. M.; abdomen tight, but not distended, moving very little; tender to the left of umbilicus, especially just beneath costal margin. Pulse 122. No vomiting. We diagnosed perforation on an almost empty stomach. | A perforation found close to the lesser curvature on the anterior surface, equal in size to a No. 10 catheter. An indurated area, equal at least to a florin, around this. A single stitch put through ulcer to close it, and then ulcer buried by a double continuous suture. A flap of omentum turned over like a lid. There were many masses of lymph between the stomach and the liver, and free effusion of turbid fluid into the peritoneum; wiped with wet swabs and then dried. | D. | Dr. Burnett.<br>Dr. Oldfield, Leeds.<br>Time after perforation about 16 hours.<br>The patient died 50 hours after the operation. The temperature had kept at 104° to 105° for 36 hours before death, and the pulse was always over 160. |
| V. T.<br><br>Nov. 8, 1902 | F. | 18 | For the last few weeks some slight pain after food, just beneath the left costal arch. Pain has been worse when she laughed and when she stretched her left arm upward. Sudden onset of symptoms about 8 P. M., November 7th, pain, collapse, shallow breathing, etc. Abdomen intensely rigid and immobile. | Perforation about equal in size to a lead-pencil near lesser curvature toward cardia. Some flaky adhesions. Suture. Omental flap. No drainage. | R. | Dr. Rowden, Roundhay. |

## CASES OF PERFORATING GASTRIC AND DUODENAL ULCER.—(*Continued.*)

| Name and Date. | Sex. | Age. | Symptoms and Description. | Condition Found. Operation. | Result. | Remarks. |
|---|---|---|---|---|---|---|
| A. M.<br><br>March 5, 1903 | F. | 23 | Has had indigestion for several months. On March 1st, when in London, had a sudden attack of pain beneath left costal margin; felt faint and prostrate, vomited. Gradually felt better, and on March 3d traveled down from London to Bawtry, and ate a good luncheon on the journey. The side then felt "stiff" and hurt her if she laughed or turned quickly. On March 4th, after breakfast, a sudden extremely severe pain, collapse, and vomiting. Went to bed and has remained there since. Abdomen has gradually distended and is now blown out and tympanitic; a fluid wave easily felt. Looks very ill. Pulse 156. | Two perforated ulcers found, both on anterior surface and in cardiac half of stomach near the lesser curvature. They were distant about 1½ inches from each other. One opening was the diameter of a lead-pencil; the other of a knitting-needle. From both fluid gushed out. Both closed by suture and stomach folded over. Omental lid afterward covered both in. Drainage by split tube and gauze wick at upper part of incision and through a separate suprapubic incision. | | Dr. Johnson and Dr. F. Johnson, Bawtry. |

# TABLE II.

## GASTRO-ENTEROSTOMY FOR SIMPLE DISEASES:

### CHRONIC ULCER OF STOMACH AND DUODENUM, HEMATEMESIS, MELENA, PYLORIC STENOSIS, AND DILATED STOMACH.

| Name and Date. | Sex. | Age. | Symptoms and Description. | Condition Found. Operation. | Result. | Remarks. |
|---|---|---|---|---|---|---|
| E. B.<br>January, 1900 | F. | 41 | At age of 16 had an illness, attended with the vomiting of blood, on one occasion in large quantity. Pain after food ever since, at times better, at times worse. Diet has been carefully and rigidly supervised. In June, 1899, pain began to be much more acute, and vomiting, which before had been inconstant, now became frequent. Large quantities (4 pints) were vomited. On examination of abdomen, a large contracting stomach seen. Nothing abnormal felt over pylorus. | Thickening at pylorus, and along first portion of duodenum, with contraction and many adhesions. The adhesions were carefully broken down. A gastro-enterostomy was performed, with the aid of Laplace's forceps; the operation being very simple and speedy. | R. | Quite restored to health. Eats well and suffers no pain.<br>July 29, 1902: Quite well; in "first-rate health." |
| F. S.<br>February, 1900 | M. | 35 | Prolonged symptoms of chronic ulceration of stomach with hyperchlorhydria. Under medicinal treatment (bismuth and morphin about 2 hours after meals, etc.) he improved for a time, but eventually treatment induced no improvement. Since June, 1899, has been steadily losing ground. Pain and vomiting, severe and disabling, and of daily occurrence. On examination, a large and contracting stomach. | Very dilated stomach, with pyloric contraction, some thickening and many adhesions. Gastro-enterostomy, with Laplace's forceps. | R. | Has been very well since the operation. Has gained (July, 1902) about one stone in weight. |
| A. B.<br>January, 1900, and March, 1900 | M. | 55 | Dyspepsia for 10 or 12 years, culminating 5 years ago in an "attack" which lasted 2 weeks, and was remarkable for the severity and continuance of epigastric pain, and the persistence of vomiting. Since this attack, has had periodic seizures of copious vomiting at intervals of 24 hours to 3 weeks. Pain after food, at intervals of 3 to 6 hours, varying greatly in severity, but generally not amounting to more than discomfort. On one occasion in hospital the vomited matter measured 5½ pints. The stomach was huge and flabby, but contractions were always visible. HCl present. | Enormous stomach. When distended with 2 seidlitz powders, the outline of the greater curvature descends behind the symphysis pubis. An ulcer was found extending onward into the duodenum, cicatricial contraction very marked, adhesion to liver.<br>Gastro-enterostomy by the aid of Laplace's forceps, and separation of old adhesions. | R. | Dr. Bailey, Horsforth.<br>Patient reports (August, 1902) himself "as well as ever he was in his life, and able to eat anything." |

GASTRO-ENTEROSTOMY FOR SIMPLE DISEASES.—(*Continued.*)

| Name and Date. | Sex. | Age. | Symptoms and Description. | Condition Found. Operation. | Result. | Remarks. |
|---|---|---|---|---|---|---|
| | | | This patient returned to hospital in March. After operation, there was considerable relief for about a month. Then after a heavy meal, consisting largely of boiled peas, there was an attack of pain and vomiting, and from that date the symptoms gradually returned. On admission, his condition was practically the same as before operation. The abdomen was again opened, and a second gastro-enterostomy, with the aid of Murphy's button, performed. The opening made at the first operation, between the stomach and intestine, was practically closed. Patient made a good recovery. When seen in September, 1900, he said he was "never better in his life, had gained over 2 stones in weight, and had no gastric anxieties or discomforts." | | | |
| F. H.<br>June, 1900 | M. | 32 | Symptoms of ulcer, "acid dyspepsia," 10 months ago; relieved for 1 month by bismuth and morphin. For 7 months severe pain after food, worse about 2 hours after a meal. Vomiting every 2 or 3 days up to 3 months ago, since then almost daily; stomach dilated and contracting. Lost 2 stones in weight. Free HCl. | Dense ring at pylorus, sharply defined, and about $\frac{5}{8}$ inch in breadth. A few adhesions, which separated readily.<br>Posterior gastro-enterostomy without mechanical aid. | R. | Has regained lost weight, and can eat heartily without discomfort. |
| S. H.<br>August 1, 1900 | | 49 | Nine months ago first noticed pain in epigastric region after eating; five months ago first vomited; pain and vomiting speedily increased in frequency and severity. Now the pain commences about 1 or 2 hours after food, and continues until vomiting comes on spontaneously or is induced. No blood has ever been noticed in the vomit. No solid food has been taken for $2\frac{1}{2}$ months; the chief diet is milk and soda. Considerable wasting. A dilated stomach is obvious on examination. On distention by seidlitz powder, the greater curvature descends $2\frac{1}{2}$ inches below the umbilicus, and contractions, faint but distinct, are seen. Free HCl. | Hard cicatricial rings at pylorus, a few adhesions to liver; the finger, invaginating the anterior wall of the stomach, feels and recognizes the pyloric orifice merely as a dimple.<br>Posterior gastro-enterostomy by suture without mechanical appliances. | R. | "Complete relief." Report, July, 1902. Is perfectly well, and can eat and digest ordinary food. |
| T. H.<br>June 6, 1900 | M. | 52 | For several years has suffered from indigestion. During the last 6 months has suffered acutely; pain and vomiting have become increasingly frequent. He has lost $3\frac{1}{2}$ stones, and looks pinched and ill. The stomach is very largely dilated, and is easily seen contracting. Free HCl is present. | A thick, tough mass at the pylorus, densely adherent. A few enlarged glands near the tumor. Anterior gastro-enterostomy. | R. | Dr. Clarke, Doncaster.<br>Weight before operation: 7 stones.<br>Dr. Clarke writes on July 6, 1902: "I saw J. H. this morning looking well. He now weighs $10\frac{1}{2}$ stones, his old weight. He is doing his ordinary work, and is in splendid health." |

| | | | | | | |
|---|---|---|---|---|---|---|
| A. C.<br>Jan. 15, 1901 | F. | 52 | Menopause 5 years ago. Since then has been subject to attacks of vomiting, increasing in frequency and severity; vomited blood at the beginning of these attacks, but not lately. Pain after food constantly, generally 1 to 2 hours after. Is relieved by vomiting. On examination a very dilated stomach, with obvious contractions. On filling with $CO_2$ stomach is seen to descend 1 inch below umbilicus. Free HCl. Traces of lactic acid. Oppler-Boas bacilli. No tumor felt. | A large pyloric tumor, with many adhesions, especially behind gland, felt at head of pancreas and along the lesser curvature. Removal found quite impossible.<br>Posterior gastro-enterostomy. | R. | Dr. La Touche, Ossett.<br>In July, 1902, this patient was in good health, very stout, and "the wonder of the countryside." The tumor was thought to be possibly malignant. |
| W. B.<br>Feb. 22, 1901 | M. | 60 | Had an "ulcerated stomach" 20 years ago; gastric uneasiness ever since. During last 2 years has been under constant treatment by many doctors. Pain severe and constant, increased by solid food: In epigastrium radiating round and through left side to back. Very rarely vomits; stomach dilated; no wave-like contractions observed. Is said to have passed tarry motions. Has lost weight (2 st. 9 lbs.). Taken only liquids; very little of them. Free HCl a trace. A trace of lactic acid. Diagnosed malignant disease implanted on ulcer. | Stomach a little dilated; quite close to pylorus on the anterior wall; an ulcer equal to a shilling in size, with puckering of serous coat, a little thickening and induration, but clearly not malignant.<br>Posterior gastro-enterostomy. | R. | Sent by Mr. Stansfield.<br>Weight at operation, 8 st. 8 lbs.; June 5th, 10 st. 3 lbs.; September, 1902, 10 st. 8½ lbs. |
| L. S.<br>Feb. 19, 1901 | F. | 31 | For several years attacks of gall-stone colic. Seven months ago removal of stone impacted in cystic duct. Uneventful recovery from operation. Since then symptoms of dilated stomach; copious vomiting at intervals of two or three days; pain, uneasiness, feeling of distention after food. Stomach below umbilicus; waves seen without distention with $CO_2$. | Large stomach. Innumerable tough adhesions between gall-bladder, abdominal wall, and stomach. Impossible to liberate them, so gastro-enterostomy was performed. | R. | Dr. Waugh, Skipton (Hospital).<br>September, 1902. Quite well. Eats heartily, and has absolutely no pain. |
| E. W.<br>Feb. 20, 1901 | F. | 27 | Has been continuously under medicinal treatment for nearly 2 years. Suffers from pain before food, when stomach is empty, and after taking food in anything but very small quantities. Pain when fasting is relieved by a drink of milk and a small biscuit, anything more causes pain after an interval of ½ hour. Vomiting has been occasional; no blood. Has been kept at rest and dieted for a long period without any result. Tenderness in epigastrium; distention slight. | An ulcer equal in size to a shilling about 1 inch from pylorus. During the operation a marked circular contraction of stomach at the site of ulcer was seen. The stomach seemed as though tied with a tape; pale, densely hard, and narrow. When firmly contracted, the mass formed a tumor about as large as a golf ball.<br>Posterior gastro-enterostomy. | R. | Dr. Waugh, Skipton (Hospital).<br>September, 1902. Very well indeed. Has made a perfect recovery. |
| S. B.<br>Feb. 16, 1901 | F. | 51 | For some years has had pain after food and diarrhea. For last 5 or 6 months pain has been much more severe after every meal. It comes on about ½ hour after food, and lasts for 3 hours or more. Vomiting is infrequent, unless self-induced to obtain ease. | Three ulcers found. Two in stomach near lesser curvature, one about an inch from pylorus, the second 2½ inches, one in first part of duodenum, with considerable induration. | R. | Dr. Lockwood, Halifax.<br>Made a good recovery. When seen 3 months after the operation had gained 10 lbs. in weight. |

## GASTRO-ENTEROSTOMY FOR SIMPLE DISEASES.—(*Continued.*)

| Name and Date. | Sex. | Age. | Symptoms and Description. | Condition Found. Operation. | Result. | Remarks. |
|---|---|---|---|---|---|---|
| | | | On two occasions has noticed blood, but only in small quantities. Has lost health and strength, and has thinned. Continuous treatment for 5 months has proved unavailing. Tenderness on pressure over pylorus. Doctor writes: "Had tried all the usual drugs without relief, that nothing could be taken without great pain, and she was losing flesh and strength." Stomach a little dilated, excess of HCl. | Posterior gastro-enterostomy by simple suture. | | |
| M. B.<br>Feb. 5, 1901 | F. | 56 | Five years ago an operation was performed for removal of gall-stones. There were many adhesions round the pylorus. For 2 years had symptoms of pyloric obstruction, for which posterior gastro-enterostomy was done, by a colleague; Murphy's button being used. For over a year was very much better. Then symptoms returned. Vomiting copious; pain intolerable. Diet limited to thin fluids. On examination, the stomach was dilated to left of umbilicus, and seemed anchored toward pylorus. | The peritoneum was with difficulty opened owing to the numberless and dense adhesions, which were quite bewildering. The posterior surface of the stomach was adherent to the anterior abdominal wall at place of former anastomosis. A second wide anastomosis was now made immediately beyond the first one. On introducing one finger into the stomach, and another into the jejunum, the first opening was found to be almost or completely closed. | R. | Dr. Hick.<br>Weight, 7 st. 6 lbs.<br>February 6, 1902, 8 st. 5 lbs.<br>Takes food well, no pain; "highly satisfied." |
| M. H.<br>Feb. 12, 1901 | F. | 22 | Indigestion for 9 months, quite intractable. Began with a severe attack of pain, accompanied by vomiting, lasting 3 days; blood noticed in vomit during first day. Since then, pain always after food, generally 1½ hours after, radiates to right shoulder. Vomits frequently, but at very irregular intervals. She has had bismuth and morphin and much medical treatment, but absolutely without more than temporary benefit. Stomach down to umbilicus and splashy. | Stomach dilated, as result of an ulcer about 1½ inches on cardiac side of pylorus; much induration, and a few adhesions to abdominal wall and gall-bladder.<br>Posterior gastro-enterostomy, by suture. | R. | Dr. Milne, Mirfield.<br>Has been seen at intervals since. Can take ordinary food in any quantity. |
| M. A. G.<br>Feb. 11, 1901 | F. | 44 | Symptoms began 12 months ago. Pain in body after meals, which had been trivial for many years, became then troublesome, generally felt about 1½ hours after food. Radiated round right side to the back. Vomiting every day or two as a rule. | Large stomach. Puckering and induration on posterior surface of pylorus, adherent to pancreas.<br>Posterior gastro-enterostomy. | R. | Dr. Clements, Farnley.<br>September, 1902: "Quite well and very grateful for what has been done." |

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| | | | On a few occasions did not vomit for days. Has noticed blood once only. Very rigid and tender over pyloric area. Stomach dilated to right below umbilicus. Free HCl. | | | |
| M. P.<br>March 19, 1901 | M. | 30 | Symptoms 5 or 6 years. Pain in epigastrium after meals; most severe in bed at night, slight pain between shoulders. Vomiting for 12 months, almost regularly on alternate days. "Watery phlegm very sour"; once blood. Lost nearly a stone in weight. Always careful in diet. Has attacks of faintness, prostration and melena. | Ulcer in first portion of duodenum, with many adhesions. Small scar of gastric ulcer on posterior surface.<br>Posterior gastro-enterostomy. | R. | Dr. Millhouse. Dr. Anning.<br>May 31, 1901, gained 12 lbs. Eats well. No "attacks" since operation. Weight: November, 1902, 8 st. 9 lbs. |
| M. C.<br>April, 1901 | M. | 48 | Under medicinal treatment 5 years with stomach disorder. Has been carefully dieted; still is always expecting and generally has pain, distention, uneasiness after food. Has bled freely several times recently. Stomach dilated. The symptoms since Christmas have been those of Reichmann's disease. Hyperchlorhydria. The recent occurrence of severe hemorrhage, necessitating rest 2 or 3 days in bed, has alarmed him. The attacks have left him anemic and prostrate, and he has lost over a stone in weight. | Large ulcer at least size of a florin on the posterior surface, near the pylorus. A scar of a smaller ulcer is seen on posterior surface about 3 inches from the pylorus.<br>Posterior gastro-enterostomy. Owing to stoutness and rigidity of muscles, I was hampered during the operation, and made a smaller opening than usual. | R. | Dr. Ellis, Halifax.<br>A ventral hernia in upper part of scar.<br>A Pagenstecher thread, with which I stitched up the abdominal wall, suppurated and discharged itself.<br>Report, August, 1902: "In robust health." |
| W. K.<br>April 29, 1901 | M. | 59 | Soldier 25 years. Has been ill 2½ years. At first loss of appetite, indigestion, and flatulence. Has attacks of severe pain, limited to upper right quadrant of abdomen, followed by vomiting. These came 2 or 3 times a week, vomiting always relieves them. Has lost 4 stones. On two occasions, June, 1899, and March, 1901, has vomited bright blood. On last occasion, melena also noticed; stomach descends to within 2 inches of the pubes, and is seen actively contracting. | A hard mass at pylorus, and a thickening of head of pancreas. (Probably simple, though possibly malignant.) Stomach shows scars of three ulcers. Posterior gastro-enterostomy.<br>An example of chronic pancreatitis due to gastric or duodenal ulceration. | R. | Dr. Basil Housman, Edgeley, Stockport.<br>Weight, 8 st. 5½ lbs. June 26th, gained 31 lbs., and perfectly free from pain.<br>Died of pneumonia in December, 1901. Was better in health before this than for many years. "The pyloric tumor had disappeared. He could eat and digest anything, and was quite a hearty man."<br>(Dr. Housman.) |
| E. J. W.<br>May, 1901 | F. | 48 | "Gastric ulcer," 1889. Since then digestive disturbances. Pyloroplasty in January. Complete relief for about 5 weeks; then return of all symptoms. Very tender and rigid beneath upper part of right rectus. Hematemesis 3 times recently. | Much induration and thickening at pylorus, with some adhesions. The ulceration had widely extended. Posterior gastro-enterostomy. | R. | Dr. E. R. F. Mason, Gomersal.<br>Was quite well after gastro-enterostomy. |

## GASTRO-ENTEROSTOMY FOR SIMPLE DISEASES.—(*Continued.*)

| Name and Date. | Sex. | Age. | Symptoms and Description. | Condition Found. Operation. | Result. | Remarks. |
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| Mrs. H.<br>June 20, 1901 | F. | 37 | Has had indigestion for 20 years. Pain after food, vomiting at intervals of 4 days at the longest. Never has a "good meal": cannot eat solid food. Five years ago an acute attack of vomiting, lasting several days; a similar attack 17 or 18 months ago. On both occasions blood was noticed. She says, "I've no pleasure in living, and can't go on as I am." Stomach dilated to 2 inches below umbilicus; faint waves; no gurgling or forcing sounds. A thin, sallow dyspeptic woman. | Dilated stomach. Three distinct scars on anterior surface, one at pylorus with much induration and omental adhesions. Two on stomach side of that. A few adhesions on the posterior surface. Posterior gastro-enterostomy. | R. | Dr. B. W. Housman, Edgeley, Stockport.<br>Weight before operation, 5 st. 11½ lbs.<br>Weight, April, 1902, 6 st. 10 lbs.<br>In September, 1902, Dr. Housman writes: "Can enjoy any ordinary food and is in complete comfort. She is very grateful indeed." "Is better than she has ever been in her life."<br>Weight, December, 1902, 7 st. 12 lbs. |
| A. H.<br>Nov. 7, 1901 | F. | 24 | Has had characteristic symptoms of gastric ulcer for about 18 months. For the last 6 months has been kept in bed under medicinal treatment, but has vomited almost daily, and on all occasions blood in greater or less quantity has come. Is very pallid and anemic. In hospital she vomited daily, fresh and partially digested blood. She is very much blanched, has attacks of fainting in bed, and looks very ill. | An ulcer, close to pylorus, with thickening over an area the size of a shilling. A dense, hard area, with reddened surface and edges, covered with lymph on the posterior surface. Posterior gastro-enterostomy, an ulcer, probably the bleeding one, on posterior surface being excised, and the opening left united to the jejunum. | R. | Dr. Clarke, Wakefield.<br>Was in the Manchester Union Infirmary in 1902. Was said to have recently had attacks of vomiting, but when carefully watched, no vomiting was observed, and she was discharged. |
| N. W.<br>Aug., 1901 | F. | 28 | Stomach trouble since 12 years old. Pain after food and vomiting; never hematemesis; no melena. If she takes a meal now, feels full and uncomfortable for about 1½ hours, then pain, generally becoming acute, leads to vomiting, which gives ease. Constant unease. Stomach dilated and protosed. | Ulcer found near pylorus on greater curvature; a few adhesions. Very large flabby stomach. The pancreas seen above the lesser curvature. | R. | Dr. F. W. Robinson, Huddersfield.<br>Had slight regurgitant vomiting for 12 days, relieved by first washing out of stomach; no feeling of sickness after. Rapidly gained health and strength.<br>In August, 1902, "Very well indeed."<br>In December, 1902, "Very well indeed." |

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| T. T.<br>Nov. 2, 1901 | M. | 40 | Symptoms began in June, 1900; burning pain and vomiting after food, generally ½-hour after a meal. No hematemesis. Two months ago an attack of vomiting, lasting 2 days; extreme irritability of stomach. No melena. On examination, a huge stomach, contracting. Free HCl. Loud gurglings at pylorus. Has had severe cramps in muscles of neck and extremities. Tetany. | Enormous stomach. Several ulcers (5 well marked) in stomach, and one just beyond the pylorus. Posterior gastro-enterostomy. | R. | Dr. Millhouse and Dr. G. P. Anning, Kirkstall.<br>Weight before, 8 st. 6½ lbs.<br>April, 1902, 9 st. 3½ lbs.<br>Can eat anything without discomfort; feels better than for years. |
| F. D.<br>Nov. 30, 1901 | F. | 19 | Twelve months ago began to have pain after food, coming generally about ½ hour after a meal, and increasing in severity for 2 hours. This is increasing in severity, and is now extreme and disabling. Constant feeling of sickness after food, and retching; vomits only every week or ten days, and then in copious quantities. No hematemesis, and no melena. On examination, a dilated stomach to 1¾ below umbilicus. Free HCl. Lavage and medicines have been tried for 4 months without any benefit. | Very dilated stomach; a scar of large indurated ulcer found about 1½ inches from the pylorus. Posterior gastro-enterostomy. | R. | Dr. Tyrie, Keighley.<br>Has "gone on splendidly." August, 1902. |
| E. W.<br>Dec., 1901 | F. | 19 | Has complained of pain after food and vomiting for 16 months. Hematemesis at the onset, but only on two occasions in last 12 months. Pain comes on almost immediately after food. Vomits at least every week. Pain is at once relieved if she lies on the abdomen prone. Dilated stomach. Free HCl. | No ulcer on anterior surface. On posterior surface a large indurated scar. The posterior surface of the stomach was very adherent to the upper layer of transverse mesocolon; the lesser sac being partly obliterated. Posterior gastro-enterostomy. | R. | Dr. Tyrie, Keighley.<br>Had a sharp attack of bronchitis after the operation for 3 days.<br>In September, 1902, was quite well; eating heartily, and had gained about 10 lbs in weight. |
| N. G.<br>January, 1902 | F. | 26 | For last few months has had pain, always after food, coming on immediately and lasting for three or four hours. Has, therefore, limited her diet and has lost weight. Four weeks ago had hematemesis and melena. The melena has continued ever since, and is now threatening to end disastrously. Has fainted in bed several times. Pulse 96. She is very pallid, and has become much thinner during the last four weeks. | An ulcer in stomach on posterior wall. An ulcer, elongated and thickened in duodenum, feeling like a date. Many adhesions. Posterior gastro-enterostomy. | R. | Dr. Ellis, Halifax.<br>This patient made a perfect recovery, and in September, 1902, was reported to be in perfect health. She has regained her lost weight and 7 lbs. over. |
| M. R.<br>Feb. 3, 1902 | M. | 43 | Long-standing stomach trouble. Began 20 years ago; pain after food and vomiting. Has been more or or less subject to indigestion, and has carefully limited his diet, vomiting from time to time in large quantities. Motions occasionally tarry. Last October a sharp attack of hematemesis and melena. Stomach now very dilated 2 inches below umbilicus. In last four months has lost a stone in weight. | Very large flaccid stomach. At the pylorus and a little beyond much thickening, forming a tumor equal in size to a walnut. On anterior surface a distinct scar about 3 inches from pylorus. On posterior surface a similar scar with adhesions to transverse mesocolon. Posterior gastro-enterostomy. | R. | Dr. Ellis, Halifax.<br>In August, 1902, heard that he was in good health, quite free from stomach troubles, and had gained a stone in weight. |

## GASTRO-ENTEROSTOMY FOR SIMPLE DISEASES.—(*Continued.*)

| Name and Date. | Sex. | Age. | Symptoms and Description. | Condition Found. Operation. | Result. | Remarks. |
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| S. H.<br>March 17, 1902 | F. | 34 | Has suffered intermittently with indigestion since she was 13 years old. For the last 6 years she has been worse, and for the last 2 years she has "not had a bite of solid food," living on milk and milk and soda. Vomiting of blood 6 years ago, neither before nor since. Now vomits large quantities, and says that her stomach "seems to fill up for 2 or 3 days and then has to be emptied." Weight, 5 st. 7 lbs. Very large stomach; on distention reaches to within 1 inch of the umbilicus. Free HCl. | An enormous stomach. The pyloric antrum is covered with cicatrices, forming an almost continuous fibrous mass. Posterior gastro-enterostomy. | R. | Dr. B. W. Hogarth, Morecambe.<br>Weight before operation, 5 st. 7 lbs.<br>Never vomited once after operation; was taking solid food when she returned home on 17th day.<br>Dr. Hogarth writes in May, "She is enjoying better health than ever before."<br>May 28th. Weight 6 st. 7½ lbs.<br>September, 1902. "I have been doing 17 or 18 hours' work a day, and my work has not been a burden to me as it was before the operation."<br>Weight 6 st. 10½ lbs. |
| M. N.<br>April 17, 1902 | F. | 25 | For several years has suffered from chronic indigestion. Symptoms date from a sudden attack of vomiting, with blood-stained ejection. Pain about half an hour after food; body becomes very distended; belching is frequent and vomiting occasional. Latter always gives relief. During last June symptoms much worse. Constant indigestion, vomiting and wasting. Stomach reaches before distention 1½ inches below the umbilicus. | A very large flabby stomach. On the anterior surface, near the pylorus, an ulcer about 1½ inches long by ½ inch wide, very thick and indurated. Posterior gastro-enterostomy. | R. | Dr. Sproulle, Mirfield.<br>Has made a perfect recovery. Eating well and absolutely free from any discomfort.<br>Weight 6 st. ½ lb.<br>Weight, January, 1903, 7 st. 8 lbs. Eats well and enjoys food. |
| A. W.<br>April 2, 1902 | M. | 38 | Symptoms of ulcer of the stomach 15 years ago. In bed for six weeks; pain, hematemesis and wasting. Ever since has had chronic indigestion; never able to eat a hearty meal; solid food causes distention, pain and vomiting. Now vomits about twice a week, and has measured the amount on two occasions recently, | Dilated stomach. On the posterior surface of the stomach the scar of a large chronic ulcer, with many adhesions to it from transverse mesocolon. Ulcer about 3 to 4 inches from the pylorus; some adhesions also at the pylorus. Posterior gastro-enterostomy. | R. | Dr. F. W. Halliday.<br>This patient vomited one pint of altered blood on four occasions in first 24 hours after operation.<br>Had regurgitant vomiting |

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| | | | on each five pints. Very dilated stomach, splashing and contracting. | | | about twice weekly after the operation. Was then ordered to wash the stomach out twice weekly; since then has been better, though he feels bilious and disinclined for food at times. In Jan., 1903, vomited a "slough," after this improved rapidly; was able to eat well and gained 1 lb. in weight every week. |
| M. F. April 17, 1902 | F. | 29 | From childhood has had trouble with the stomach. Constant indigestion. Four years ago a severe prostrating attack in which she vomited frequently and blood came on several occasions in large quantities. Indigestion very much worse since that attack. Constant regurgitation. In early December last year a similar attack called "gastric ulcer" by Dr. Smith; she was in bed 3 months. Since getting up has had intolerable pain, constant vomiting, and has wasted considerably. Stomach dilated and very tender over pyloric area. Free HCl in excess. | Large stomach. Ulcer on anterior wall near the pylorus as large as a shilling, thick and very hard. Adhesions of great omentum to it. Posterior gastro-enterostomy. | R. | Dr. Smith, Hunslet. Made an excellent recovery. By September had gained 11½ lbs. in weight. |
| M. R. June 4, 1902 | F. | 27 | Five years ago had an acute attack of abdominal pain, vomiting, etc. Was in bed 22 weeks. The doctor who saw her and the consultant diagnosed "perforating" ulcer of the stomach. Constant indigestion, pain and vomiting since then; can never take solid food, and ordinary liquid diet causes pain and uneasiness. Vomits every three or four days now. Stomach moderately dilated. | Very dense and numerous adhesions on posterior surface of the stomach, especially thick and tough near the pylorus. A fairly large stomach. Posterior gastro-enterostomy. | R. | Dr. Millhouse and Dr. Anning. Made a very good recovery. |
| M. A. June 12, 1902 | F. | 37 | About 10 years ago began with pain and sickness; she was laid up in bed on several occasions. The vomiting was "dreadful," but no blood was ever observed. For seven years continual indigestion. At the end of that period alarming hemorrhage; was in hospital 5 weeks. Vomiting and pain have continued intermittently since. Was advised by consultant to undergo operation last year. Dilated stomach; for several months has noticed occasionally that stools "were black as ink." | Numerous adhesions at the pylorus and duodenum, especially on the posterior surface. A very large stomach. Some marked local thickening of the head of the pancreas. Posterior gastro-enterostomy. An example of chronic interstitial pancreatitis due to gastric and duodenal ulceration. | R. | Dr. Ellis, Halifax. By August had gained 12½ lbs. By September, 4 additional pounds. On October 15th, 2 stones heavier than at the time of operation. In Feb., 1903, had gained 6 lbs. more. |

## GASTRO-ENTEROSTOMY FOR SIMPLE DISEASES.—(*Continued.*)

| Name and Date. | Sex. | Age. | Symptoms and Description. | Condition Found. Operation. | Result. | Remarks. |
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| M. G.<br>July 2, 1902 | M. | 47 | Has had indigestion for four or five years, gradually increasing in severity until the present time, when he is disabled from work. Pain after food was the first symptom, coming on about 1½ hours after a meal and increasing in severity for an hour, unless eased by vomiting, which always afforded relief. There has never been hemorrhage. On examination a very large stomach, descending about 1½ inches below umbilicus, before inflation. A few contractions seen on inflation. Has "cramps" in his arms and hands, rarely in his legs; especially noticed during the last two months. Tetany. | A very large stomach. A large scar on the posterior surface, near the lesser curvature, about 2 inches from the pylorus. A second scar at beginning of the second portion of the duodenum. Many adhesions round pylorus. Posterior gastro-enterostomy. | R. | Dr. A. A. McNab.<br>Made a rapid recovery, and within three weeks was eating ordinary meals with great relish. |
| M. H.<br>July 19, 1902 | M. | 30 | Illness dates from four years ago, when he had an attack of hematemesis, bringing up about a pint of blood. He was kept in bed about a month, and apparently made a complete recovery. A year later he developed symptoms of dyspepsia, there being vomiting, especially at night; there was no further hematemesis. Under treatment he improved considerably. Eighteen months later the same symptoms reappeared and have remained since, gradually increasing in severity. He now vomits two or three times a week in very large quantities. The stomach reaches to the pubes, and can be seen actively contracting. He is very thin and much wasted and shrunken; he has not been able to eat solid food for months. Free HCl found on three occasions; no lactic acid. | An enormous stomach, thickly hypertrophied. Dense scarring at and near the pylorus. A few external adhesions. Posterior gastro-enterostomy. This was quite the thickest stomach wall I have seen, and it would be approximately one-third of an inch thick; the increase being due largely to hypertrophy of muscle. | R. | Dr. Woodyatt, Halifax.<br>Weight before, 6 st. 10½ lbs.<br>Weight four weeks after operation, 7 st. 5½ lbs.<br>He could then eat heartily and take any solid food.<br>In Feb., 1903, had gained over 2 stones. |
| M. W.<br>July 19, 1902 | F. | 24 | For 15 months has had symptoms of gastric ulcer, pain, vomiting, and inability to take solid food. Eleven weeks ago the symptoms became pronounced. Vomiting became frequent. During the last 5 weeks has vomited daily, and on almost all occasions blood has come. While waiting in hospital she vomited 3 times in 5 days, and on each occasion almost half a pint of blood came away. She is very blanched. Pulse 112. The motions | Stomach moderately dilated. On the anterior surface near the pylorus were two scars equal in size to a threepenny-piece, distant about 1 inch from each other. A few thin adhesions between these and the anterior abdominal wall. On the posterior surface near the pylorus an indurated area about 1 inch in diameter, with reddened area around it, and covered by recent | R. | Dr. Eskrigge, Royston.<br>An excellent recovery. Vomited once after operation on 6th day, about 4 oz. of bile; no blood. In September had gained 8 lbs. in weight and was eating well. |

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| | | | | were slightly tarry on two occasions. Her general appearance is that of profound anemia. | lymph, was found. Several adhesions to the transverse mesocolon. Posterior gastro-enterostomy. | | In Feb., 1903, was "still improving," and in excellent health. |
| 5 | M. C.<br>July 21, 1902 | F. | 35 | When 18 to 20 years of age suffered severely from chlorosis. Four years ago she fell from a ladder, striking the upper part of the abdomen. She was in bed for a fortnight, and suffered great pain and swelling in the upper part of the abdomen. Since this time has had pains after food, fulness and feeling of tight distention, vomiting and loss of weight. On examination a large dilated stomach, reaching a little below the mid-point between umbilicus and pubes. An example of gastric ulcer due to traumatism. | A web of adhesions round the pyloric end of the stomach and posteriorly; densest near the pylorus on the posterior surface. A very large flabby stomach. Posterior gastro-enterostomy. | R. | Sent by Dr. Johnstone and Dr. Hearder, Ilkley.<br>Weight before operation, 7 st. ½ lb.<br>Weight 3 weeks later, 7 st. 8 lbs.<br>Has improved steadily. |
| 65 | E. W.<br>July 29, 1902 | F. | 32 | Symptoms have lasted 1 year. First noticed discomfort after food, and later acute pain, always in the pit of the stomach. Vomiting set in early and was frequent. Blood was observed on several occasions; the most vomited at one time was "about a teacupful." Latterly has had to limit her diet solely to fluids. On examination a tumor as large as a cocoanut found over the pylorus, slightly movable during respiration, a little tender. The stomach is very much dilated. Free HCl always present. | A large tumor at the pylorus and many adhesions to liver, abdominal wall and pancreas. All perfectly smooth and "finished off." No irregular nodules anywhere. I believe the mass to be inflammatory and perform gastro-enterostomy. | R. | Dr. Baxter-Tyrie.<br>Weight, August 2d, 6 st.<br>Weight, August 22d, 6 st. 7 lbs.<br>Appetite quickly increased, and food was taken freely and without discomfort.<br>In Feb., 1903, had gained 1½ stones. |
| | J. H.<br>August 7, 1902 | M. | 31 | Ten months' history of pain after food and gradual loss of weight. All solid food has been abandoned little by little, and now a fluid diet causes pain, occasional vomiting in large quantity and distention. Had twice had hematemesis. The pain is frequently felt about 1½ hours after food. He has lost exactly 4 stones in the last 19 weeks. A very dilated stomach. Free HCl present. | While lying under the anesthetic on the table the dilated stomach showed prominently. It descended a hand's-breadth below the umbilicus. On opening the abdomen a thickening of the duodenum above the bile-papilla was felt; the first portion of the duodenum and the stomach were very markedly dilated. Posterior gastro-enterostomy. | R. | Dr. Norman Porritt, Huddersfield.<br>A good recovery, eating solid food before leaving hospital. Has had occasional fulness after meals and slight pain, but has eaten heartily and gained 12½ lbs. in weight (Oct. 20th).<br>Gained 1 st. (Dec. 8th). "Feeling stronger." |
| | C. W.<br>August 23, 1902 | M. | 23 | Has suffered from indigestion for nearly 4 years; pain and vomiting almost daily. Has never noticed any blood. Now vomits once or twice weekly in large quantity. A very dilated stomach. On inflation it descends 3½ inches below the umbilicus. Free HCl. No lactic acid. | Adhesions between anterior wall of stomach and parietal peritoneum. On separating these a scarring of the stomach wall. A very large stomach. Posterior gastro-enterostomy. | R. | Dr. Readman, Skipton.<br>Seen October 14th. Had gained 1 stone in weight Eating well and heartily.<br>In Feb., 1903, quite well. |

GASTRO-ENTEROSTOMY FOR SIMPLE DISEASES.—(*Continued.*)

| Name and Date. | Sex. | Age. | Symptoms and Description. | Condition Found. Operation. | Result. | Remarks. |
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| W. L.<br>August 25, 1902 | M. | 19 | For 18 months has suffered from indigestion, which, in spite of temporary improvement for a week or two under treatment, has steadily got worse. He saw me 4 months ago, and I advised lavage and medicinal treatment, but no benefit has resulted. His diet is now almost entirely liquid, causes him incessant pain, and every week or so he vomits copiously. A very large splashy stomach. Has slight tetanic contractions of hands. Free HCl. | A large stomach. On the posterior surface many and thick adhesions, especially near the pylorus. Posterior gastro-enterostomy. | R. | Dr. Waugh, Skipton.<br>Gained 6 lbs. in weight before leaving the hospital.<br>In Jan., 1903, a stone heavier. |
| J. W. R.<br>August 28, 1902 | M. | 46 | Symptoms date from last December. Pain over ensiform cartilage and vomiting. The vomiting was first and chiefly noticed after he had been in bed an hour or two. He had occasionally to get up 3 or 4 times. At Easter the vomiting became more copious, but less frequent. Occasionally "dark brown, with a very bad smell." The stomach is very prominent, standing out boldly from the rest of the abdomen, and is actively contracting. Free HCl. | The most hypertrophied stomach I have seen. The whole wall at least ½ inch in thickness. A thick, hard ring at the pylorus and many adhesions. Posterior gastro-enterostomy. | R. | Transferred from Dr. Chadwick.<br>Eating heartily and had gained 5 lbs. on discharge. In October had gained 16 lbs. more.<br>In Feb., 1903, had gained 2 st. 10 lbs. since the operation. |
| A. S.<br>August 28, 1902 | M. | 27 | For 2½ years has had "dyspepsia." Complains chiefly of pain on the right side over the pylorus, which begins 2 hours after a meal and gradually increases. He feels "as if he wanted to vomit and can't"; belches sour and offensive gas at intervals. Has severe cramps in muscles of arms, back, and occasionally legs. Lives entirely on milk. A stomach dilated to 1½ inches below umbilicus. Free HCl in excess. | A scar near the pylorus, about the size of a sixpence. A few adhesions to this and immediately beyond. Similar adhesions on the posterior surface. Posterior gastro-enterostomy. | R. | Dr. I. Taylor.<br>Solid food on 11th day. Eating full diet on discharge. |
| M. P.<br>October 4, 1902 | M. | 29 | He has suffered for several years from a "weak stomach," having pain after food, 2 or 3 hours after, and occasionally vomiting. Was in his usual state of health up till August 31st last. On that day he had a long and tiring bicycle ride which left him weary. On Sunday ate heavily and had much discomfort. On Sunday night he got out of bed, owing to the feeling of fulness in the stomach and | We diagnosed chronic duodenal ulcer, with acute deepening and the opening of some large vessel. Operation was advised as a last resort. On opening the abdomen the stomach was found very dilated and full of gas; it contained no blood. The first portion of the duodenum was also dilated. About 1 inch from the pylorus a dense, | R. | Dr. Fearnley, Harrogate.<br>This patient was in a most critical condition. I have never seen any patient, even after a severe accident, so blanched. While being lifted on to the opera- |

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| | | | the great uneasiness. He induced vomiting, and the bowels were then moved. He felt faint and cold. On Monday was feeling very tired, so did not get up; still ill and weakly on Wednesday. The stools on both days were quite black. On Wednesday he fainted once while in bed and felt very chilled. On Thursday the bowels were opened 4 times, and large tarry stools passed. On Tuesday he was noticed to be very pale; his pallor increased on Wednesday very decidedly. On Thursday morning was seriously ill. Pulse 122; very blanched; felt "dead tired," and the bowels were moving frequently, and on all occasions blood was coming. When I saw him he looked desperately ill. His face and mucous membrane of the mouth blanched to the last degree. | hard mass equal in size to a walnut was felt, adherent to the pancreas. Excision of this ulcer was impossible, and therefore gastro-enterostomy was performed. The jejunum at the point opened contained brownish altered blood. The transverse colon was a most vivid dark-blue in color and full of blood. | | tion table he complained of being tired and cold, and then fainted. |
| Miss B.<br><br>Sept. 16, 1902 | F. | 37 | Has had indigestion for "many years." Eighteen months ago she had "perforated gastric ulcer" of the subacute type, diagnosed by Dr. Bishop. Since then her stomach symptoms have been intolerable. Pain constant and gravely increased by food of any kind; vomiting at least every other day, fermentation, and eructation of obnoxious gas. She has vomited frequently half a chamber-utensil full of sour semi-digested food. She has "lost a lot of flesh." The stomach is very large, obviously standing out on her thin abdomen. The washing out required 49 pints before the fluid returned clean. Free HCl. | The stomach was buried in adhesions to both anterior and posterior surfaces. The whole outline of the stomach was warped. The posterior surface was exposed with some little difficulty, owing to adhesions to transverse mesocolon. Posterior gastro-enterostomy was done. I was dissatisfied with the way in which the anastomosis seemed to "sit" after returning within abdomen. Reflux vomiting occurred; 132 ounces of deeply bile-stained fluid were vomited in 2 days. I therefore reopened the abdomen and performed an antero-anastomosis between the afferent and efferent limits of the anastomosing loop. | R. | Dr. R. W. S. Bishop, Kirby Malzeard.<br>Gained 9 lbs. in weight. She often remarked, "I'm surprised at myself eating so much." |
| Miss T.<br><br>Sept. 25, 1902 | F. | 28 | She has had stomach troubles since she was 15. "Attacks" of pain, vomiting and inability to take food, lasting 2 to 3 weeks. Then for a week or two she is much better, until another "attack" commences. Has had continuous medicinal treatment without lasting benefit. During the last 6 or 8 months her pain has been constant, a "dull ache" increased by food and eased by vomiting. Has not been able to take an ordinary meal for at least 6 months. On examination the stomach is just down to the umbilicus. There is marked epigastric tenderness on firm pressure. Free HCl. Never hematemesis. | A large stomach. Along the lesser curvature, near the middle of the stomach, is a broad indurated band about 2 inches in length, and 1 inch in breadth. On the posterior surface this is felt and seen more clearly than on the anterior, and a few adhesions are found. Posterior gastro-enterostomy. | R. | Dr. O'Connell, Keighley. |

## GASTRO-ENTEROSTOMY FOR SIMPLE DISEASES.—(*Continued.*)

| Name and Date. | Sex. | Age. | Symptoms and Description. | Condition Found. Operation. | Result. | Remarks. |
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| Mrs. B.<br>Sept. 25, 1902 | F. | 60 | Has been failing in health for 9 to 10 months. The chief symptom has been vomiting. At the onset a sudden seizure of vomiting, very acute and lasting over 24 hours. There has been a series of attacks of vomiting. Pain is noticed about an hour before a meal is due, and lasts from a few minutes to 2 or 3 hours; is never very severe. She has lost flesh and has got weaker, occasionally having to spend a part of the day in bed. No melena. No hematemesis. A small, hard tumor felt above and to the right of the umbilicus, a little movable. On distention with $CO_2$ an enormous stomach, reaching a full hand's-breadth below the umbilicus. | A very large stomach. On the posterior surface of the stomach one large ulcer with several thick adhesions around it. In the second portion of the duodenum the tumor is found. It is a mass about the size of a large walnut, adherent to the pancreas, with which it seems inseparably connected. The duodenum above this point looks distended. Probably chronic duodenal ulcer with interstitial pancreatitis. | R. | Dr. Welch, Stanningley. In Jan., 1903, was eating heartily and was free from all discomforts. |
| T. B.<br>Sept. 24, 1902 | M. | 32 | On April 9th of this year patient was suddenly seized with an acute attack of pain in the right hypochondrium. He vomited frequently and some blood was noticed. The attack lasted 2 hours, and subsequently the motions were seen to be tarry. Since then he has suffered almost constantly from flatulent distention of the abdomen, especially after food. On several occasions he has had very severe attacks of pain in the right hypochondrium lasting one or two hours, and "doubling him up." Each attack has been followed by profuse tarry stools, and on 2 occasions has been accompanied by hematemesis. The pain is chiefly situated above and to the right of the umbilicus; the painful spot can be covered by a finger-tip. There has never been jaundice. He has lost 6½ stones in weight since February. The stomach is a little dilated. Free HCl is in excess. | A duodenal ulcer occupying the first and second portions of the duodenum was found. It was about the size of a walnut, very thick and adherent to the pancreas. Posterior gastro-enterostomy was performed. The gall-bladder was found choke full of stones. These were removed, and a few stones from the hepatic duct were easily squeezed along the cystic duct into the gall-bladder. The latter was drained. The stones numbered 1885. | R. | Dr. Mackenzie, Burnley. Operated upon at the Infirmary for Mr. Mayo Robson. |
| W. S.<br>October 1, 1902 | M. | 39 | Symptoms first appeared 3 years ago, quite suddenly. After drinking in the early morning, on an empty stomach, 2 glasses of beer, he was suddenly seized with a violent attack of vomiting and profound collapse lasting 2 to 3 hours. There was no blood. Has since this been subject to occasional erratic outbursts of vomiting. Abdominal discomfort has | A tight cicatricial pylorus showing evidences of old ulceration. The induration of the ulcer extended for about an inch along the duodenum on the upper surface, which is adherent to the liver. Posterior gastro-enterostomy. | R. | Dr. La Touche, Ossett. Dec. 1st, Has gained 1 st. 2 lbs. since operation. Eating heartily. |

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| | | | been present daily, and is worse after food. He has taken no solid food for 3 months, as he "could not bear the pain." He has noticed "black-looking stuff" in the vomit, which his doctor has told him is blood. The stomach is distended, reaching 1½ inches below the umbilicus. Free HCl. | | | |
| J. H.<br>October 6, 1902 | M. | 30 | Has had symptoms of gastric ulcer for 5 years; pain after food about 1 or 2 hours after every ordinary meal; occasional vomiting; some eructations; melena. During the last six months the pain has come about 3 hours after food, and has always been easier if a little fluid food or a biscuit has been taken. He is quite unable to take ordinary food, and treatment, though carefully followed out, has not helped him. Is losing weight, and is becoming progressively anemic. Has a large splashy stomach. Melena has not been noticed for 2 months. | A moderately dilated stomach; the scar of a duodenal ulcer found just beyond the pylorus. Some thickening and puckering. On the posterior surface of the stomach, near the pylorus, a white scar, the size of a French bean. Some adhesions to the upper surface of the transverse mesocolon. Posterior gastro-enterostomy. | R. | Dr. H. De C. Woodcock, Leeds. |
| F. G.<br>Oct. 20, 1902 | F. | 38 | Well up to 3 years ago. Then pain after food and vomiting; pain was felt about ¼ to ½ hour after food and was relieved by vomiting. Food and mucus were ejected, occasionally a "dark-brown bitter fluid." During the last 12 months has vomited daily and has curtailed her diet. For the last 6 months has taken only Benger's food, cocoa, milk pudding, etc., not any solid. On examination a very large stomach reaching 3½ inches below the umbilicus. Contractions faint though quite distinct. Free HCl. | A large stomach. A dense series of scars near the pylorus with many slight adhesions. The pyloric antrum much scarred. The rest of the stomach very large and rather thick. | R. | Dr. I. Taylor, Beeston Hill. |
| J. H. B.<br>Oct. 30, 1902 | M. | 28 | For 14 months has had indigestion. At the onset an acute attack of indigestion lasting 5 days; occasional vomiting then but no blood. He fainted several times and had tarry motions. During last 3 months has become progressively worse, has lost over a stone in weight, has constant pain after food and occasional vomiting. Can now take only fluids and is "wearing down" fast. Moderately dilated stomach. Free HCl. Old blood noticed in stools in Infirmary almost daily. | Duodenal and gastric ulcers. Duodenal ulcer in first portion, about the size of a threepenny-piece, very hard, and slightly adherent. A scar on posterior surface of stomach near the pylorus. | D. | Dr. Stamp Taylor, Leeds. Hernia of almost the whole small intestine through opening in the transverse mesocolon. Death on tenth day. |
| M. S.<br>Nov. 1, 1902 | M. | 36 | Has suffered from his stomach for 20 years. Dull pains between the shoulders after food, exquisite pain and tenderness in the epigastrium. Vomits occasionally. Is always very careful and sparing in his diet, any excess is at once followed by an | A moderately dilated stomach, reaching 2 inches below umbilicus. Active contractions can always be seen. The right side of the epigastrium is very tender, and the right upper rectus very rigid. | R. | Dr. Readman, Skipton. Appetite rapidly returned. |

## GASTRO-ENTEROSTOMY FOR SIMPLE DISEASES.—(*Continued.*)

| Name and Date. | Sex. | Age. | Symptoms and Description. | Condition Found. Operation. | Result. | Remarks. |
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| | | | "attack" lasting 3 or 4 days. Since May of this year has lived on semi-solids, he has lost 1 st. 10 lbs. in weight. He has frequent tingling and numbness in both hands and severe cramps in the calf of one leg, sometimes in both legs, when in bed at night. Recently has had cramps in the thighs. These attacks of cramp set in almost simultaneously with a seizure of vomiting after he has been in bed a short time. Has had to give up work. Free HCl. | | | |
| J. R. Nov. 29, 1902 | M. | 36 | Severe and increasing dyspepsia for many years. Is now reduced to fluid foods; and the taking of these causes almost constant pain and occasional outbursts of vomiting. Has been losing weight recently. Looks pale, careworn and thin. | On exposing the stomach a large and densely indurated and adherent ulcer was found on the lesser curvature, fast to the liver and pancreas. A linear scar on the anterior surface of the stomach, running obliquely, was at least 2½ inches in length and felt like a wheal of keloid. There were several other scars on both surfaces. Posterior gastro-enterostomy. | R. | Dr. B. W. Housman, Edgeley, Stockport. This patient began to improve at once and rapidly. He was eating ordinary meals heartily within a fortnight. |
| I. S. Dec. 2, 1902 | F. | 17 | In April of this year had an operation for perforation of a duodenal ulcer. For the first 2 months all went well, but she was never able to take full diet freely. During the last 2 months the stomach has been very irritable, only fluids have been taken. Pain and discomfort after foods have gradually increased. Stomach dilated, especially toward the cardiac end. | Innumerable adhesions. The posterior surface of the stomach could not be reached, on account of adhesions of omentum, transverse colon, etc.; nor could the duodeno-jejunal flexure be reached. The cecum was therefore found and the ileum traced upward from it to the highest point of the jejunum free from adhesions. A Roux's operation was then performed to the anterior surface of the stomach. The cecum and colon were contained in a mesentery common to them and to the small intestine. | R. | Dr. Wainman, Leeds. By March, 1903, had gained 11 lbs. in weight. |
| W. P. Dec. 12, 1902 | M. | 56 | For 13 years the patient has suffered from severe indigestion. At the beginning of this period he had an acute gastric ulcer; hematemesis and severe pain being the symptoms. (The diagnosis was made at that time by his medical man.) Since then the stomach has been dilated. Pain and a sense of | A thick dilated stomach. The pyloric region was very hard and gristly for the extent of an inch. There were adhesions from this area to the liver. Old ulceration with considerable induration and adhesion. | R. | Dr. Woodcock. Weight 8 st. 1½ lbs. Was seen by a surgeon with a view to operation 8 years ago. Operation not advised. |

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| | | | weight are constant after solid foods, so that the diet has voluntarily been restricted almost entirely to fluids. Vomits 2 or 3 times a week. On examination a stomach much hypertrophied and reaching 3 inches below umbilicus. Waves of contraction easily seen. | Posterior gastro-enterostomy. | | |
| M. E. P.<br><br>Dec. 27, 1902 | F. | 32 | This patient stated that she had suffered from her stomach "all her life," and that since the age of 14 she had "never had a day's ease." After all food, even fluids, there was pain and sickness. Twelve months ago an attack of hematemesis. Under observation in hospital it was found that if a quantity of milk greater than 3 ounces were given, some was vomited within a few minutes. Patient said it was 8 years since she had been able to drink a glass of milk at once On insufflation the stomach becomes prominent, but is decidedly smaller than normal. Vomiting was excited by distention. | Multiple scars on the stomach. Perigastritis. The stomach not dilated at any part. On the contrary, smaller than normal, and toward the pyloric end so densely scarred and so adherent as to be converted into a rigid tube.<br>Posterior gastro-enterostomy. The anastomosis made at cardiac side of the contracted portion. | R. | Dr. Thorman, Kirkburton.<br>This patient had other manifestations of congenital syphilis. It is possible that the gastric condition was due to syphilis. |
| W. B.<br><br>January 7, 1903 | M. | 37 | Patient says that he has been troubled with his stomach "all his life"; but during the last 12 months the symptoms have been very much worse. About half an hour to an hour after food there is severe burning pain in the epigastrium and sour eructations begin and last for 2 or 3 hours. Every 2 or 3 days has attacks of vomiting; very large quantities of food are ejected, and he has frequently recognized food taken 2 or 3 days before. The vomit at times "smells and tastes rotten." He had "bad rounds" even in childhood. Has lost 1½ stones in last few months. On examination a very large splashing stomach. | On opening the abdomen a very large, and somewhat hypertrophied stomach was found. The pylorus was thick and fibrous and felt almost solid. On the posterior surface of the stomach about 3 inches from the pylorus two hard nodules of scar tissue were felt, about an inch apart.<br>Posterior gastro-enterostomy. | R. | Dr. E. R. F. Mason, Gomersal.<br>In March, 1903, had gained 9 lbs. in weight. Had a small stitch abscess in abdominal wall. A catgut ligature removed. |
| A. S.<br><br>Jan. 17, 1903 | F. | 28 | In May, 1898, a sudden attack of hematemesis and fainting. Was in bed 6 weeks. For 18 months subsequently very poor health, indigestion, vomiting, and constipation. Then 6 months of good health. In April, 1900, indigestion began again; was under medicinal treatment for 6 months with much benefit. In January, 1902, hematemesis, and again treatment in bed for 4 weeks. Four months ago another attack of hematemesis. Saw Dr. Rowling then for first time; was in bed under treatment for 7 weeks. During the last months symptoms have returned. Pain comes on about an hour after food—sometimes just after food. She vomits | On examination an ulcer was found about 3 to 4 inches from the pylorus close to the lesser curvature. It was as large as a shilling, very dense, and adherent to the pancreas behind. A second ulcer was found in the duodenum, just beyond the pylorus, about ¼ inch in diameter.<br>Posterior gastro-enterostomy. | R. | Dr. Rowling.<br>By March had gained 5 lbs. in weight. Eating well. |

GASTRO-ENTEROSTOMY FOR SIMPLE DISEASES.—(*Continued.*)

| Name and Date. | Sex. | Age. | Symptoms and Description. | Condition Found. Operation. | Result. | Remarks. |
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| | | | 3 or 4 times a day. On examination a tender epigastrium—pressure causes a pain through to the back. No dilatation of stomach. Excess of free HCl. | | | |
| J. E.<br>Jan. 22, 1903 | M. | 47 | In January, 1902, when returning from Las Palmas had a severe attack of melena. Several years before this had been subject to indigestion and inability to eat heartily, but for a few months before this attack of bleeding had been in better health than usual. Since this attack has had many others, of melena and hematemesis. Has been in a nursing home in London for 13 weeks, under treatment for duodenal ulcer—while there, had occasional severe bleedings and his hemoglobin count was only 18 %. On examination he was very thin and anemic. A dilated, obviously contracting stomach seen, from which he shortly afterward vomited a quart of fluid containing blood. This patient looked very worn and ill. It was necessary to infuse saline solution during and after the operation. The day and the night before operation he had copious melena. | An enormous stomach, slightly hypertrophied. The first portion of the duodenum was imbedded in a mass equal in size to a lemon; inflammatory thickening round an ulcer. On the greater curvature an ulcer equal in size to a shilling near pylorus.<br>Posterior gastro-enterostomy. | R. | Dr. Bampton, Ilkley.<br>Seen in consultation with Dr. Barrs.<br>Was soon able to take ordinary diet. By March, 1903, had gained 7 lbs. Had a severe attack of diarrhea, lasting 4 days, in the fifth week. |
| J. H. W.<br>Feb. 3, 1903 | M. | 37 | Has had indigestion for several years. The onset of symptoms very gradual; pain after food was first complained of, then vomiting, at intervals at first of a week or longer. On the whole these symptoms have gradually increased in severity. In December, 1901, began to be very much worse; pain followed all foods and he has lost appetite, vigor, weight. For several months his stomach "has been on strike." He has vomited in large quantities every 3 or 4 days. On examination a very much dilated stomach, faintly contracting. Excess of HCl. Has lost 1½ stones in last 3 months. | A very much dilated and slightly thickened stomach. Anterior surface normal. On posterior surface close to the pylorus was a hard circular area, equal in size to a florin, densely hard. There were a few adhesions to the outer surface.<br>Posterior gastro-enterostomy. | R. | Dr. I. Taylor. |
| S. J. S. | F. | 56 | In February, 1892, was in the Infirmary for removal of an ovarian cyst. In the notes it is said that | A mass the size of a Tangerine orange found in first portion of the duodenum. Milky | R. | Dr. Woods, Batley. |

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| Feb. 9, 1903 | | | the patient then suffered much from indigestion, and on one occasion had melena. Since then Dr. Woods has attended her for chronic indigestion. On several occasions there has been severe melena. In December, 1901, hematemesis. In 1887 a medical man diagnosed an acute illness as "ulcerated stomach." Now has pain 2 or 3 hours after a meal all over upper part of abdomen, and frequently "heaving and vomiting." Can now take nothing solid except biscuits. During last 12 months has lost over 3 stones in weight. In September, 1902, a prolonged attack of melena. Has persisting anemia. | opacity of the overlying peritoneum. In the stomach near the greater curvature, about 4 inches from the pylorus, an ulcer equal in size to a sixpence. The omentum was crumpled up and adherent over it. | | |
| C. E. F.<br>Feb. 15, 1903 | F. | 31 | First vomited blood 5 or 6 years ago; slight indigestion always since. The symptoms have been greatly increased during the last 14 months. At the onset pain about 2 hours after food was the chief. Vomiting is often copious and hematemesis has occurred twice recently, once 13 months ago, once about a fortnight ago. For 11 months has been quite unable to take any solid food. Now vomits about twice a week, always in very large quantities. Has lost weight in last 2 months. On examination a stomach which reaches to within 2 inches of the pubes is seen actively contracting. Free HCl in excess. | The stomach is very large at the pylorus and about one inch on stomach side a tough ring of cicatricial tissue. There are two scars, on anterior surface of old ulcers, elongated patches of tough white pylorus tissue.<br>Posterior gastro-enterostomy. | R. | Dr. Woodyatt, Halifax. |
| G. B.<br>Feb. 19, 1903 | M. | 62 | Has suffered from indigestion and vomiting for several years. Says he doesn't remember when he was able to take an ordinary meal in comfort. Three years ago was seen by a physician, who diagnosed pyloric stenosis and gastric dilatation, and advised operation. Since then the vomiting and pain have increased to such a degree that the patient says he "cannot go on any longer." On examination an enormous stomach actively contracting. | A large hypertrophied stomach. There were several scars on the stomach. The pyloric region, on both gastric and duodenal sides, was scarred and stenosed.<br>Posterior gastro-enterostomy. | R. | Dr. Adams, Sowerby Bridge. |
| M. W.<br>Feb. 19, 1903 | F. | 30 | Onset of gastric symptoms 10 years ago: quite gradual onset, pain after food, loss of weight and appetite. Phthisis then suspected. Two years ago the pain became more acute, after all foods, solid or fluid. Vomiting at times. On examination a dilated stomach was found and lavage advised. Twelve months ago a distinct peristalsis of stomach was observed. Now a dilated and con- | A dense scarred area at the pylorus, and for an inch on gastric side. A very dilated stomach. A second ulcer near the greater curvature on the posterior surface.<br>Posterior gastro-enterostomy. | R. | Dr. Hearder, Ilkley.<br>Dr. Carter, Sheffield. |

GASTRO-ENTEROSTOMY FOR SIMPLE DISEASES.—(*Continued.*)

| Name and Date. | Sex. | Age. | Symptoms and Description. | Condition Found. Operation. | Result. | Remarks. |
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| | | | tracting stomach easily seen without distention. Has been losing weight rapidly during the last few weeks. | | | |
| F. E.<br>Feb. 20, 1903 | F. | 30 | Had a gastro-enterostomy done a year ago, and made a good recovery. Since then has had occasional vomiting of bile. This has become more frequent lately, and in hospital was almost a daily occurrence. | Roux's operation.<br>The anastomosis was most satisfactory. The afferent loop was divided close to the stomach. Its distal end closed and the proximal implanted into efferent loop. | R. | Infirmary. No vomiting after operation. Soon took food in good quantity and gained weight. |
| Mrs. S.<br>Feb. 20, 1903 | F. | | Five years ago an attack of hematemesis. Three years ago a second attack. Sixteen months ago a third. Since the first attack has always been subject to indigestion. Has been most carefully treated by rectal feeding for several weeks, rest in bed, etc., but has never responded to the treatment. Since September has been under continuous treatment. Latterly has been unable to take even fluid food without great pain. Is now very blanched and ill. Pulse 112, feeble. A very dilated and tender stomach. A full examination was not possible owing to patient's extreme weakness. | A very dilated stomach. At the pylorus and along the lesser curvature a large indurated mass. The lesser sac was almost obliterated by adhesions, which made the clamping of the stomach extremely difficult. The anterior surface had no adhesions. An anterior gastro-enterostomy would have been simpler. I performed the posterior, however. Two pints of saline infusion given, as the patient's condition was very bad. | R. | Dr. Willans Ovenden.<br>Menstruation began about 2 hours before the operation. An abscess formed in the abdominal wall. |
| Mrs. F.<br>March 3, 1903 | F. | 40 | Five years ago had a severe attack of hematemesis, from which she nearly died. She was in bed under treatment for 4 months. Since then has had chronic indigestion. Pain came about 1½ hours after food. Vomiting occasionally. Appetite always poor. Four days ago another attack of bleeding and 12 hours ago a third attack, both these were copious. On examination the stomach was felt to be full. The patient was blanched, pulse 120, respirations 28. Epigastrium tender and painful. Operation urged, in the fear that further hemorrhage might prove serious. | Two ulcers found. One near the pylorus, about the size of a shilling, rather hard, and showing recent bands of adhesion from the omentum. A second linear ulcer on the posterior surface about 4 inches from the pylorus. No attempt made to deal with ulcers. A posterior gastro-enterostomy was rapidly performed. | R. | Dr. H. J. Clarke, Doncaster. |
| M. D. | F. | 21 | Stomach symptoms began in October, 1901; pain after food, generally 1½ hours after, occasional | A dense fibrous induration at the pylorus, producing marked stenosis. A few | R. | Dr. Woodcock, Leeds. |

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| March 6, 1903 | | | vomiting. Symptoms have gradually become worse. Pain occurs after all foods, a heavy burning sensation. Vomits copiously 3 or 4 times a week. On examination a very large and hypertrophied stomach. | omental adhesions. No other ulcers found.<br>Posterior gastro-enterostomy. | | |
| | | | **EXCISION OF ULCER.** | | | |
| M. P.<br>July 10, 1902 | M. | 18 | Four years ago had searlet fever. Since then has never been quite robust. Has suffered at times from pain after food and vomiting. These would be present for two to three days, then would abate, and he would be quite well for a few weeks. Has been careful in his diet. An ordinary hearty meal would invariably arouse the symptoms. Had no hematemesis. On July 6th, ate an ordinary breakfast, late in the morning felt ill, epigastric pain and vomiting. At first vomiting seizure only food came back; at the second a "quart of blood." Later in the day vomited blood—a pint and a half—measured by his doctor. On the 7th vomited blood twice, on each occasion over a pint of clot; on the 8th, twice; on the 9th, three times; on the 10th, once in large quantity and once in small. When I saw him he was very blanched, his face waxen and sweating. The pulse was 114, very thin and feeble. He had been free from abdominal pain since the attack of vomiting. The hemorrhage had told upon him severely. The persistence of symptoms of gastric ulcer for four years, with hematemesis of five days' duration, made the diagnosis chronic gastric ulcer, with recent deepening of the ulcer. It was probable that the bleeding from a dense indurated area would not stop spontaneously. I therefore advised operation. | The abdomen was opened through the right rectus muscle. Almost at once a hard patch about the size of a shilling was felt in the anterior wall of the stomach, near the lesser curvature toward the cardiac end. This was the ulcer. It was cut out between two elliptical incisions. The horizontal wound thereby resulting was closed transversely. A careful examination of the rest of the stomach was made, but nothing abnormal found. The abdomen was closed in the usual manner. | D. | For a week the progress of the case was most satisfactory. On the ninth day immediately after the administration of an enema the patient complained of faintness, he became collapsed, and died within a few minutes. No post-mortem examination was allowed. |

## TABLE III.

## PYLOROPLASTY FOR PYLORIC ULCER AND STENOSIS.

| Name and Date. | Sex. | Age. | Symptoms and Description. | Condition Found. Operation. | Result. | Remarks. |
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| T. W. | M. | 38 | Twelve years ago had "ulcerated stomach," a sharp illness lasting about a fortnight, attended with extreme pain in epigastric region, and on the right of that, frequent vomiting, but no hemorrhage. More or less indigestion ever since this attack; has never felt able to eat indiscriminately, but has carefully selected his diet. Now marked dilatation of stomach, and obvious peristaltic contractions. Vomits every 3 or 4 days, in large quantities. On examination of stomach contents, free HCl is found. | Scar of ulcer exactly at pylorus; puckering, but no adhesions. Pyloric channel equal in size to a No. 8 or 9 catheter. Pyloroplasty. | R. | Quite well in August, 1900. Has gained 2 stones, and eats "anything." Since then has had slight return of symptoms, occasional indigestion, no vomiting. |
| A. H.<br>Sept., 1899 | M. | 36 | When 18 years of age had an illness, which his medical attendant at that time told him was due to an "ulcer on his stomach." For the last 18 years (half his life) has had daily attacks of indigestion, except for a period of nearly two years, which terminated 6 years ago. Has lived for last 3 to 4 years entirely upon fluids. Has tried all medicines without lasting advantages. For 12 months has washed the stomach out daily once or twice. Now has pain after every meal, beginning about 2 hours after, and lasting until vomiting is induced, or lavage is employed. Stomach dilated and splashy. Wave-like contractions very distinct. Nothing felt on palpation over pylorus. | Scar of ulcer at pylorus, no adhesions, but decided limited thickening; pyloric channel just admits a director. Pyloroplasty. | R. | Patient writes: "Restored to perfect health after 18 long years of suffering. I am heavier than I have ever been before."<br>In October, 1902, was still well and eating without any discomfort. |
| E. J. W.<br>January 12, 1901 | F. | 48 | Illness 14 months ago; called "gastric ulcer" by her medical man. There was acute pain, after the taking of anything by the mouth, for 3 days, followed by a sharp attack of vomiting in which she lost a "pint" of blood. On the following day the pain was easier, but vomiting continued and a little blood was noticed. She has not taken solid food, except on infrequent occasions since then. There has always been pain after food, beginning about 1½ hours after. Vomiting has been irregular. Sometimes does not vomit for 3 days, sometimes many times in 1 day. On examination, dilated stomach, reaches down to umbilicus. Contraction waves seen after distention with gas, faintly. Free HCl. No lactic acid. | Scar of an ulcer about 1 inch from the pylorus. Puckering of serous coat. The little finger could not be made to enter the stricture. No adhesions. Pyloroplasty was performed. Opposite the stricture the stomach was equal to a No. 8 or 9 catheter in diameter. | R. | Dr. E. R. F. Mason, Hill Top, Gomersal.<br>Ate ordinary diet for 1 week before discharge; no discomfort and no vomiting.<br>See list of Gastro-enterostomies, May, 1901. |

# TABLE IV.
## HOUR-GLASS STOMACH.

| No. | Date. | Sex. | Age. | Symptoms and Description. | Condition Found. Operation. | Result. | Remarks. |
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| 1 | August, 1899. | F. | 39 | Ten years ago the patient had an illness characterized by profound anemia. Seven months ago there were clear symptoms of ulcer of the stomach, but neither then nor at any time any acute illness suggestive of perforation. Now, vomited after all ordinary food, and more often than not even after small quantities of fluid food. Pain after food was exceedingly severe. On examination of abdomen, a dilated stomach could be felt. At one point, a little to the left of the middle line and slightly below the ensiform cartilage, was an area 2 inches in diameter, which was markedly tender and offered increased resistance on palpation. This area was found at the operation to correspond precisely with the area of stomach adhesion. The patient had lost weight, and deteriorated seriously in general health during the last few months. | Hour-glass stomach, the narrow constriction being near the middle of the stomach and adherent to the anterior abdominal wall over an area equal to a crown-piece. On each side of this, the stomach dilated and seemed to be anchored by the adhesion. On separating the stomach from the abdominal wall, an opening into the viscus was exposed, and the stomach contents escaped. This opening was enlarged transversely, and the wound and fistula were stitched up vertically. An omental graft was brought to cover in the sutured area in order to guard against future anchoring. | Recovery. | For a month after the operation there were pain at times and loss of appetite. Since then she has been free from pain and in excellent health. Appetite and digestion are good. Patient seen with Mr. Bailey, Horsforth. In Feb., 1902, condition was still perfectly satisfactory. |
| 2 | April, 1900. | F. | 27 | There was no history of gastric ulcer. The patient had complained of irregular attacks of pain in the epigastric region for eleven months, always associated with the taking of food, and coming on about one hour after a meal. Vomiting was occasional and irregular, in rather large quantities; there was no blood. On examination, the stomach was distended and splashy; contractions were seen when distended. Medical treatment had proved unavailing. | Hour-glass stomach. The constriction was about 4 inches from the pylorus; the passage between the two sacs equalled a No. 12 catheter in diameter. There were marked induration and puckering, but no adhesion to the abdominal wall or elsewhere. The strictured neck was divided by an incision about 2½ inches long in the transverse direction, and stitched up vertically, the mucous membrane with a continuous catgut suture, and the serous with a continuous silk suture. Two additional interrupted sutures were applied at each end of the wound. | Recovery. | Vomiting for five days after the operation, blood-stained. Since then perfectly well. Patient seen with Dr. Waugh, Skipton. In March, 1902, reported to be in complete health. |

## HOUR-GLASS STOMACH.—(*Continued.*)

| No. | Date. | Sex. | Age. | Symptoms and Description. | Condition Found. Operation. | Result. | Remarks. |
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| 3 | Jan. 24, 1901. Hospital; Registered No., 443. | M. | 45 | Ailing for three years. Pain in the epigastrium radiating to the left chest. Was worse after food, coming on "within half an hour," and lasting for from two to four hours, unless relieved by vomiting. Frequently vomited about an hour after food; never any blood. Lately the pain had been almost constant, aggravated by food, and eased by vomiting. Had lost 2 st. 12 lb. Dilated stomach. On distending with $CO_2$, a notch was noticed at the upper border of the stomach, and a tentative diagnosis of hour-glass stomach was made. Free HCl. A trace of lactic acid and a few rod-shaped bacilli. | An hour-glass stomach. The scar of the ulcer was equal in size to a florin, was situated close to the lesser curvature, and nearer the cardiac orifice than the pyloric. There were much puckering and induration of the surface. There were no adhesions. The index-finger entered, but could not pass the stricture. An incision 3½ inches long was made transversely, and stitched longitudinally in two layers. A slender adsion of gall bladder to the pylorus was divided. (Gastroplasty, gastrolysis.) | Recovery; before leaving hospital, the ordinary diet without any discomfort. | Weight before operation was 7 st. 6 lb.; has gained 1 st. 8½ lb. Patient was seen with Dr Trevor Pritchard, Retford. In March, 1902, reported to be quite well. |
| 4 | March 6, 1901. Infirmary; Registered No., 1221. | F. | 28 | Symptoms of gastric ulcer for more than five years. Was under treatment at beginning of illness at the Infirmary. Had been gradually getting worse. Vomited now after every meal; pain and vomiting came on about from half an hour to one hour after food. Vomit was very "sour." On examination, hour-glass stomach. On distending with $CO_2$, the cardiac half increased considerably, forming a very large lymphatic area. The pyloric half distended but little; the division was clearly seen. On auscultation, a forcing, gurgling sound was distinctly heard. | Hour-glass stomach. The cardiac side of constriction was much dilated, and larger than a normal stomach. Rather beyond the middle of the organ was a constriction that would just admit the forefinger; round constriction were much induration and many adhesions; especially noticeable was one thick cord-like one coming from the liver. This was divided between ligatures. The liver was slightly torn on separating widespread adhesions along the lesser curvature. Below it on each side the stomach sagged, and between the cavities an anastomosis was made which readily admitted three fingers. (Gastro-gastrostomy, gastrolysis.) | Recovery. | March, 1902. Perfect result. Eats well and heartily, and has no discomfort. Patient seen with Dr. Waugh, Skipton. |
| 5 | March 9, 1901. Infirmary; Registered No., 1237. | M. | 55 | Stomach troubles for sixteen years. At first pain after food and occasional vomiting. Five years ago an acute attack of hematemesis, melena, and general swelling of the body, which it was feared might prove fatal (? perforation). No ease in the | Hour-glass stomach. At first it was thought to be a dilated stomach. On tracing the stomach toward the pylorus, an extremely narrowed isthmus (barely as thick as the little finger) was come to which was supposed to be narrowed pylorus, but on | Recovery. | This patient was in the Infirmary under Mr. Littlewood, and was operated upon by me in his absence. |

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| | | | | stomach since then; constant vomiting, pain after every meal, and great wasting. Now looked thin, pinched, and shriveled. For three weeks had had no food, only sips of water and nutrient enemata. On examination, dilated stomach. Free HCl. | tracing beyond it stomach was still found. On invaginating a finger from each side of constriction, no opening could be felt. Many adhesions were separated until all was clear and free. Then incision into stomach or cardiac side of the isthmus, and a probe-director was passed through constriction, which it fitted snugly, the opening being no bigger than a No. 4 or No. 5 catheter. Gastroplasty was performed. On the pyloric side of the stricture was a column of mucous membrane forming a bridle stricture. This was ligated, divided at both ends, and removed. | | |
| 6 | April, 1901 Registered No., 1709. | M. | 46 | Symptoms for twelve months; pain, heaviness, discomfort after meals; loss of weight and general deterioration in health. At Christmas had an attack of acute pain and hematemesis, and was very ill for several days; since then has never taken any food (solid or liquid) without pain. Has noticed on several occasions that the stools were "black as ink." Vomits now every day. | Two ulcers near the pylorus, one on gastric, one on duodenal side. A mass equal in size to a walnut found at the pylorus. Pylorus very narrow; adherent to liver and gall-bladder by dense bands. At the middle of a hugely dilated stomach a constriction that would admit four fingers. Posterior gastro-enterostomy to pyloric pouch. At the post-mortem two ulcers (duodenal and gastric) were found, the former very adherent to the gall-bladder; the latter had perforated into a mass of adhesions, its base being partly formed by the pancreas. | Death. | Sent by Dr. Crawford Watson, Harrogate. All went well for three days; then a large prolapse of rectum (from which he had previously suffered) came down during the night, and was not discovered for four hours. When I saw him, the prolapse was livid and edematous, and could not be reduced until ether had been administered. From this time patient became gradually worse; the temperature ran up to 104° and 105°, and he died four days later. The following is an abstract from the post-mortem record, written by Dr. Maxwell, Telling: "The stitches are quite sound, the opening good, and surgical technique perfect. No peritonitis. The hemorrhoidal and inferior |

## HOUR-GLASS STOMACH.—(*Continued.*)

| No. | Date. | Sex. | Age. | Symptoms and Description. | Condition Found. Operation. | Result. | Remarks. |
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| | | | | | | | mesenteric veins are full of disintegrating clot. (Septicemia.)" |
| 7 | May 24, 1901. Registered No., 2413. | M. | 48 | For many years has vomited after food. Pain comes on about one and a half hours after food, and is eased by vomiting. In Nov., 1899, and May, 1900, had severe hematemesis. Three years ago was in the infirmary, and a diagnosis of "cancer" was made. On examination, an irregular dilated stomach. On inflation, a distinct notch seen in the lower border; just above this a very loud, forcing, gushing sound heard. Hour-glass stomach diagnosed. Signs 1, 3, 5, and 6 present. | Hour-glass stomach. The cardiac pouch much dilated, pyloric small and not dilated. The constriction was about 3 inches from the pylorus. At the upper border of the isthmus a hard mass, equal to a walnut in size, with puckering of stomach and lesser omentum. (Posterior gastro-enterostomy.) | Recovery. | Sent by Dr. Isaac Taylor. Weight before operation 8 st. 2 lb. Weight Jan. 15, 1902, 10 st. |
| 8 | May, 1901. | F. | 50 | Ailing many years, the symptoms dating from an illness in which "gastric ulcer" was diagnosed. A diagnosis of "hour-glass stomach" was made by Dr. M'Gregor Young. Signs 1, 3, and 6 present. | Hour-glass stomach; the isthmus being about 2½ inches from the pylorus. The stomach and all the intestines were thin and translucent, and seemed almost devoid of muscle. On exposing the posterior wall of the cardiac pouch, a second ulcer was seen. Posterior gastro-enterostomy was performed. After the operation, regurgitant vomiting of such severity and persistence that a second operation was undertaken, and the proximal and distal segments of the jejunal loop were united. (Jejuno-jejunostomy.) | Recovery. | Patient seen with Dr. M'Gregor Young. The result of the operations has been most satisfactory; the patient is much better than she has been for many years. |
| 9 | June, 1901. | M. | 39 | Stomach troubles for nine or ten years. Then began quite suddenly to have great pain after food and to vomit two or three times a day; no hematemesis. The pain usually came on about one and a half hours after food. Seen four years ago by a consulting physician, who diagnosed dilated stomach, and advised lavage, which has been done | Hour-glass stomach. The constriction just admitted the end of the forefinger, was situated about 3 inches from the pylorus, at a point where loud gushing sounds were heard before operation. The cardiac complement was enormous, the pyloric a little dilated. (Posterior gastro-enterostomy. Pylorodiosis.) | Death. | Sent by Dr. Ellis, of Halifax. After the operation patient had suppression of urine. In four days secreted only 11½ oz., tinged with blood. Pulse became very rapid and of poor volume. Five pints of |

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| | | | | ever since. Relief at first very great, but lately a serious relapse and no relief from washing. Hour-glass stomach diagnosed. Signs 1, 2, 3, and 6 present. | | | saline solution infused. Urine was secreted almost at once. Gradual improvement then for nine days; then suppression for forty-eight hours, and death. Both kidneys diseased, the left small and granular and cirrhotic, the right granular. Operation area normal. The urine before operation had been frequently examined and nothing abnormal discovered. |
| 10 | June, 1901. | F. | 25 | For three years has suffered from vomiting, pain after food, inability to take ordinary diet. Has never vomited blood, but has seen vomit which "resembled tea." Vomiting now almost continuous. Has lost 3 stones in weight. On examination a hard mass above and to the left of the umbilicus. On distending the stomach with $CO_2$ a distinct swelling on each side of tumor. Hour-glass stomach clearly seen. | Hour-glass stomach. A large mass, about 4 inches in diameter, found at the junction of the two pouches, densely hard, immovable and adherent firmly to pancreas. Several enlarged glands. Supposed to be malignant. Stricture between the two pouches dilated freely. | Recovery. | Sent by Dr. Crawford-Watson, Harrogate. Weight before operation, 5 st. Vomiting ceased at once, and food was freely, almost greedily, taken. The tumor quickly disappeared. Looks ruddy and well. Weight now, 7 st. 7 lb. |
| 11 | April, 1901. | M. | 40 | About six months ago was suddenly seized with acute, intolerable pain in upper part of abdomen. Constant stomach troubles since; pain, weight, "dragging sensations." Has lost flesh quickly. On examination, a smooth globular swelling between mid-line above umbilicus and left costal margin. Soft and fluctuating. | The stomach was hour-glass shaped; the constriction was adherent to the anterior abdominal wall. On separating the adhesion, the stomach was opened and gastroplasty was performed. The tumor pushed the stomach forward. The great omentum below stomach was torn through, and the finger passed into the lesser sac. A smooth globular cyst found projecting into the cavity and springing from the pancreas. | Recovery. | Sent by Dr. J. Exley, Wortley. A pancreatic fistula remained until to-day, but is almost closed. Health and weight fully regained. |
| 12 | July, 1901. | F. | 28 | Six years' history of increasing indigestion, dating from an illness described by the doctor as "ulcerated stomach." Pain comes on one hour after food, | Hour-glass stomach and very tight pyloric obstruction. I performed gastroplasty and posterior gastro-enterostomy into the distal pouch. | Death. | Sent by Dr. Baxter-Tyrie, of Keighley. Death from pneumonia on the fifth day. The |

HOUR-GLASS STOMACH.—(*Continued.*)

| No. | Date. | Sex. | Age. | Symptoms and Description. | Condition Found. Operation. | Result. | Remarks. |
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| | | | | worse when lying on the right side. Vomits after nearly every meal. Is getting steadily thinner. Signs 1, 2, 3, 4, 5, 6, and 7 all present. | | | anesthetic was badly taken, lividity and rigidity of abdominal muscles being present throughout. |
| 13 | April 22, 1902. | F. | 42 | Chronic indigestion. The symptoms came on gradually; pain after food, vomiting and constipation. Eighteen months ago had hematemesis, and since then the symptoms have been greatly increased. Signs 1, 2, 3, 5, and 6 present, and a diagnosis of hour-glass stomach made. | An hour-glass stomach—a perfect example. The constriction in the body admitted the little finger snugly. In the narrowed isthmus, on posterior surface a densely hard indurated area, at least ¾ inch in thickness; the lesser and greater omenta both puckered up. Gastroplasty—a scar of the ulcer seen on mucous surface of posterior part. A very tight stricture found at the pylorus; the pyloric pouch being dilated also. Posterior gastro-enterostomy from pyloric pouch. | Recovery. | Dr. H. H. Greenwood. A very rapid pulse for four days after operation. |
| 14 | Nov. 29, 1902. | F. | 27 | Nine years' history. Pain after food and vomiting were the symptoms first noticed. Soon all solid food caused pain and was rejected. The food became "sour" and the gas belched up smelt putrid. On several occasions blood has been vomited. The signs and symptoms of hour-glass stomach were elicited and a confident diagnosis made. The two pouches of an hour-glass could be distinctly seen on inflation. Signs 1, 2, 3, 5, and 6 present and an hour-glass stomach diagnosed. | An hour-glass stomach was at once exposed. But following my invariable rule I traced the stomach up to the cardiac orifice and discovered another stricture and another pouch. There were thus two annular constrictions in stomach and three pouches. The first pouch was the largest, the pyloric the smallest, being only of the size of a lemon. Gastro-gastrostomy and gastro-enterostomy were performed. The stomach was scarred almost universally. | Recovery. | Dr. Knowles, Newstead, Halifax. A most excellent recovery. |
| 15 | Jan. 20, 1903. | F. | 34 | Nine and a half years ago vomited a "great deal" of blood. Dr. Mackenzie then diagnosed ulceration of the stomach. Since then has always been ailing—especially after a moderate meal. Five years ago was very ill; had acute abdominal pain, severe vomiting, and hematemesis. Was in Manchester Royal Infirmary, with "ulcer of the stomach." One and a half | An hour-glass stomach and an hour-glass duodenum. Two large stomach pouches united by a narrow isthmus at the lesser curvature. Tight constriction at pylorus; the first portion of duodenum dilated to form a sac the size of a lemon; beyond this another constriction. The pyloric pouch of the stomach was more densely scarred than any | Recovery. | Dr. Mackenzie, Burnley. Within three weeks of the operation ate solid food heartily, and had taken all the vegetables in season. |

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| | | | | years ago hematemesis. For several years has taken no solid food and has never had an ordinary meal. Has lived on milk, custards, porridge. On examination an hour-glass stomach was diagnosed. Wölfler's two signs; paradoxical dilatation; increase in subcostal tympany; gurgling, rippling sound at left end of stomach, all well marked. | stomach I have seen; its texture was almost wholly fibrous. On its posterior surface also many scars were seen. Gastro-gastrostomy and posterior gastro-enterostomy to the pyloric pouch. | | |

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