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 CO₂. If the two halves of a seidlitz powder are separately given, and the stomach be normal or dilated, no loud sound is heard anywhere, except at the pylorus; if a constriction is present in the stomach, a loud, forcible, gushing sound can be easily distinguished at a point 2 in. or 3 in. to the left of the middle line.

6. I first called attention two years ago to a sign which I have since found of great service in establishing a diagnosis of hour-glass stomach. The abdomen is carefully examined, and the stomach resonance 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 Eichorst have both seen a distinct sulcus between the two pouches, inflated with CO₂. In Case XI in my list the two pouches with a hard, as I thought, malignant mass between them could be readily seen. When both pouches were distended with CO₂, 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 VIII 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 indiarubber 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 formation 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 oesophagus and pyloric stenosis. If the constriction in the stomach is within an inch or two of the cardiac orifice the upper locus 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 oesophagus is obstructed. A correct diagnosis can be made by introducing the oesophageal bougie; if the bougie passes over 16 in. 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 appearances and signs as a dilated stomach. Wolfier'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 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 many cases of hour-glass stomach no single operation will suffice to relieve the symptoms. This is due to the fact 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 case recorded by Terrier, a second operation is necessary. If a gastropasty 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 only be adequately treated by the performance of two operations at the same time—gastropasty and pyloroplasty—gastropasty 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.

The following are the operations that may be practised:—(1) Gastropasty; (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 cardiac pouch, when the pyloric pouch is so small that it can be ignored; (5) gastro-enterostomy from both pouches; (6) partial gastrectomy.

The number of cases upon which this paper is based is as follows:

Perforating gastric or duodenal ulcer—12 cases, of which 6 recovered; gastro-enterostomy for chronic ulcer, etc.—70 cases with 1 death; pyloroplasty—3 cases, of which all recovered; hour-glass stomach—15 cases with 3 deaths; gastroplication—1 case, which recovered; and excision of ulcer for haematemesis—1 case, which died.

CASE OF (SO-CALLED) IDIOPATHIC DILATATION OF THE OESOPHAGUS.

WITH A SUGGESTION AS TO ITS NERVOUS ORIGIN.

By C. B. LOCKWOOD, F.R.C.S.,

Assistant Surgeon to St. Bartholomew's Hospital; President of the Anatomical Society of Great Britain and Ireland.

In November, 1901, Professor James Swain published in the BRITISH MEDICAL JOURNAL (p. 1453) a case of idiopathic dilatation of the oesophagus. Last year the same patient was placed under my care by Dr. Forbes Fraser. The various treatments which had been tried had been most unsatisfactory, and it was considered that the time had arrived when it had become justifiable to perform gastrostomy. Professor Swain says that he had considered this question, but did not think the operation was "desirable so long as the patient was keeping up her nutrition." The patient was a single woman, aged 27. It was clear that all the symptoms mentioned in the first account of her case still persisted, and that her life was one of extreme discomfort. The mucus which she swallowed, and likewise her food, lodged in the oesophagus. The first few mouthfuls of food passed onwards into the stomach, but the remainder did not. At first, before the condition was recognized, the food was allowed to remain in the oesophagus until it underwent decomposition, but afterwards it was washed out with an ordinary stomach tube. The presence of food in the oesophagus caused great pain,

which ceased after vomiting or after washing out. The food was neither digested or acidified.

Professor Swaine had already come to the conclusion that there was no oesophageal pouch. A full-sized oesophageal tube always passed with ease and never got entangled. To make sure we administered about a pint of rather thick fluid with some bismuth in suspension, and then with the *x* rays saw quite clearly the shadow of the dilated oesophagus; the dilatation was fusiform, and reached from about the left bronchus to the diaphragm. It was large enough to hold about half a pint. About this time Dr. Gottstein was at St. Bartholomew's Hospital and very kindly tried to insert his oesophagoscope, but the attempt was not successful.

The patient was very anxious to submit herself to any operation, for she was living in great discomfort. For two years she had fed herself twice a day with an oesophagus tube and funnel. She had been sent up with the view of having gastrostomy done. My own experience of that operation has shown me that its dangers are small, but that its discomforts are considerable. The latter she was prepared to face. But it was difficult to see how a mere gastrostomy could succeed. It is true that it would obviate all swallowing of food, and might thus be supposed to give the oesophagus rest. But it could have no influence whatever upon the swallowing of mucus, and that is always going on to a larger extent than many are aware of. Clearly gastrostomy required to be supplemented with forcible dilatation of the cardiac opening of the oesophagus. But my experience of forcible dilatation of other orifices, more particularly of the anus, teaches that the paralysis can only be relied upon to last for a few days. Besides, as I shall presently show, it is quite feasible to dilate the cardiac aperture without resorting to a cutting operation.

Hardly anything is known about the causation of this fusiform dilatation of the oesophagus. I suppose we may assume that it is due to some disturbance of the nervous mechanism. The history of the onset in the case under discussion seems to me to support this view. The history says that four years ago she fell from a bicycle with such violence that she remained unconscious for several hours, and was confined to bed for five weeks. The difficulty in swallowing began soon after the fall. At first the food could be got down with the help of mouthfuls of water, but afterwards, as I have said, it had to be introduced with a tube. It is of course difficult to see how a mere fall could affect the nervous mechanism of the oesophagus. But I attach great importance to another point in her clinical history. After the accident her right kidney was found to have been loosened, and has remained loose and displaced ever since. Now there exists a nervous intercommunication which would be profoundly influenced by a sudden displacement of the right kidney.

The accompanying semidiagrammatic figure shows how each great splanchnic nerve swells out into the semilunar

Fig. 1.—C., coeliac axis; R.S., right great splanchnic nerve; L.S., left great splanchnic nerve; R.V., right vagus, giving off branches to the plexus gularis; S.R., suprarenal branches of semilunar ganglia; K., branches to kidneys.

ganglion. Next, how nerve branches run from the convexity of the semilunar ganglia into the kidneys and suprarenal

bodies. So far this anatomical arrangement has nothing to do with the oesophagus. But now observe how the right vagus passes down the back of the oesophagus and joins the right semilunar ganglion. It joins in such a manner as to form a loop with the right splanchnic nerve, and this loop is known to anatomists as the Memorable loop of Wisberg. I have never been able to find out why it goes by this strange name. In its course down the oesophagus the right vagus unites with the left to form the plexus gularis, from which the nerves of the oesophagus are supplied.

It is hardly necessary to point out how a sudden and violent displacement of the right kidney would act almost directly upon the right vagus. This is as far as it seems reasonable to go. The anatomy and physiology of the solar plexus do not seem to have received from physicians the attention which they undoubtedly deserve, nevertheless they are probably the clue to many hidden mysteries. A patient under my care has a pulse-rate of 73 to 75. During a moderate attack of appendicitis it fell to about 50. There seems no impossibility in this to the anatomist who traces the continuity of nerve tissue from the appendix to the solar plexus, and thence to the right vagus and onwards to the heart. The whole of this important branch of anatomy has been rendered difficult by the habit which the systematic anatomists have, with the exception of Hirschfeld, of describing the visceral nervous system as though it consisted of separate and distinct parts. Biologists have done much to inculcate more general ideas. Even the admirable Sappey gives but a truncated figure (vol. ii, fig. 608).

Acting upon the assumption that the dilatation of the oesophagus was secondary to spasmodic contraction of the cardiac orifice, I determined to try the effects of stretching. Acting under my instructions Messrs. Krohne and Sesemann made an instrument which consisted of an ordinary oesophagus tube with a distensible rubber bag around the last four or five inches of its stomach end. This bag could be distended with air by means of an ordinary hand-pump, the air being transmitted by a small tube which ran down the inside of the oesophagus tube. Inasmuch as the patient had become a great adept in passing tubes down her oesophagus there was no difficulty whatever in using this instrument. The immediate effects seem to have been excellent. Dr. Fraser, to whom I am much obliged, writes that at first it was used thrice a day before meals and afterwards twice a day, until it burst. After this she had no pain or difficulty in swallowing ordinary meals, whilst on a holiday she put on 14 lb. in weight. But inasmuch as some difficulty returned a stronger airbag was obtained, and I understand that the distressing symptoms have gone and that the patient can again swallow with comfort.

NOTE.

¹ Professor Swain says she fell downstairs and remained unconscious two hours.

THE

BENEFICIAL RESULTS OF GASTRO-ENTEROSTOMY IN SOME CASES OF IRREMOVABLE CARCINOMA OF THE STOMACH, IN WHICH THE PYLORUS IS NOT OBSTRUCTED.

By BILTON POLLARD, B.S., F.R.C.S.,
Surgeon to University College Hospital.

IN cases of carcinoma of the stomach presenting symptoms of obstruction of the pylorus, other surgeons besides myself must have opened the abdomen with the intention of either removing the diseased portion of the stomach or of performing gastro-enterostomy, and have been placed in a dilemma by finding that in spite of the symptoms the growth did not obstruct the pylorus. Removal of the growth would be the proper course if the growth were a small one and favourably located for removal. But if the growth were not favourably located for removal, and if it were thought that the risks attendant on removal were too great to warrant the attempt being made in the particular case, the surgeon would have to decide between doing nothing for the patient's relief and doing gastro-enterostomy without much hope of benefit in the absence of recorded cases or personal experience of beneficial results. The difficulty in deciding whether or not to do gastro-enterostomy would be still further increased in cases where the growth extended so far over the anterior and