patient failed to return to work after the gastrectomy, although 12 changed to a lighter job. At meal-times all the patients can take meat and vegetables. About half of them, however, restrict the size of the meal, refrain from sweet foods, and do not drink with their food. The most frequent problem in the follow-through department is how to advise a patient who has to limit the size of his meals to take sufficient food in the circumstances of his employment. Most of the patients improve on their pre-operative weight, but few regain the pre-ulcer weight of their youth. Some of them appear less robust than a normal person, but none has the distress of an intractable dumping syndrome.

Conclusion

In making this contribution I have communicated with many colleagues, who have kindly informed me of the techniques of gastrectomy which have been associated with their published papers dealing with post-gastrectomy syndromes. In all of these techniques the jejunum is fixed to the lesser curve of the gastric stump, either by a valve or by a full-width stoma. It is difficult to avoid the conclusion that this step is the cause of subsequent obstructive phenomena. This conclusion is supported by the results of the no-loop retrocolic gastrectomy described.

Summary

The inadequacy of simple gastro-enterostomy for duodenal ulcer at the present time is demonstrated.

The fallacy of judging operations for peptic ulcer on short-term results is illustrated.

The distinction between the dumping syndrome and post-operative obstructive phenomena is discussed.

Some techniques of gastrectomy are analysed with regard to post-operative obstructive effects.

Reasons are given to suggest that attaching the jejunum to the lesser curve of the gastric stump is the cause of major post-gastrectomy syndromes. A full-width stoma or valve is the technique most likely to do this. Further obstruction may result from the antecolic position of the stoma.

A method of gastrectomy is described in which a tube of fundus is mobilized to reach down to an anastomosis at the ligament of Treitz. The creation of an afferent jejunal loop is thereby avoided. No major post-gastrectomy symptoms have occurred in a 10-year follow-up of the results of this operation.

I would like to put on record my thanks for the help I have received from Mr. J. R. G. Bastable, senior registrar, and Mr. Michael P. Ward, registrar, of the London Hospital, in analysing the records of the follow-through cases to provide the material for the tables in this paper.

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ALIMENTARY BLEEDING OF OBSCURE ORIGIN

A FOLLOW-UP STUDY AND COMMENTARY

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All clinicians will have had the experience of treating patients with alimentary bleeding and in whom routine clinical and radiological tests have failed to reveal the cause. The purpose of this paper is to review the possible reasons for bleeding in such cases.

In all large series of patients with gastro-intestinal bleeding, such cases account for about 15-25% of the total series; thus Schiff (1947) recorded 26.4% among 325 admissions, and, on reviewing this and a further series of cases in 1952, still noted 20.6% of cases with no cause of their bleeding demonstrated. Palmer (1952), despite a vigorous diagnostic policy, found that 14% of his cases still evaded diagnosis several weeks after admission. Reviewing 1,252 cases, Birke and Engstedt (1956) found 15% of their cases without a proved source of bleeding. At the Central Middlesex Hospital, 20% of all admissions for haematemesis and melaena did not have any x-ray or other evidence for the source of their bleeding. In such cases the physician is anxious not to miss a chronic ulcer or, more important, a neoplasm which might at that time be operable, and he must be alert to the rare causes of bleeding. The diagnosis of the total series of admissions from 1941 to 1957 inclusive is shown in Table I.

TABLE I.—Proved and Probable Peptic Ulcer

Chronic gastric ulcer	..	..	..	..	..	423
Duodenal ulcer	..	..	..	..	..	844
Post-operative group (gastro-enterostomy or partial gastrectomy)	..	..	..	..	..	168
"Acute lesion" group (214 had an acute gastric erosion or ulcer seen gastroscopically)	..	..	..	..	..	720
Hiatus hernia	..	..	..	..	..	47
Unclassified (incomplete investigations)	..	..	..	..	..	96
						2,298
Carcinoma ventriculi	..	..	..	..	..	57
Portal hypertension	..	..	..	..	..	75
Other causes	..	..	..	..	..	96
						2,526

This problem can be studied in three ways. First, by reviewing the follow-up results to see if any subsequent causes of bleeding appear in those with initial x-ray negative findings and without any obvious clinical explanation; secondly, by reviewing our knowledge of uncommon causes so that vigilance can be increased; and, thirdly, by studying further possible precipitating causes of gastroduodenal haemorrhage.

Follow-up Studies

At the Central Middlesex Hospital nearly all the patients with gastro-intestinal bleeding are admitted under the department of gastro-enterology. Such

patients may be classified as suffering from haematemesis, melaena (altered blood in the stools), or rectal bleeding (fresh blood in the stools), or as a combination. Apart from clinical examination, the investigation of these patients included a routine barium-meal study, usually done within a week of admission, and sometimes a follow-through barium-meal examination of the small intestine and barium-enema investigation. As a routine, patients with gastro-intestinal bleeding are gastroscopied unless there is some definite contraindication. In cases of melaena or rectal bleeding sigmoidoscopy is routinely performed. Other investigations which are relevant to a particular case will be made, such as oesophagoscopy, estimation of liver function, etc.

During the period 1950-5 151 patients were admitted in whom no cause for the intestinal haemorrhage could be detected. Nine of these cases with melaena or rectal haemorrhage are included despite the x-ray finding of colonic diverticulitis, as there is always some doubt about the wisdom of attributing haemorrhage to diverticula alone unless red blood is passed. During the same period there were 1,051 admissions with bleeding from acute or chronic peptic ulceration. Thus for every seven cases admitted with bleeding due to ulcer there was one in which the cause up to the time of discharge remained unestablished.

Of this series of 151 the ultimate fate of nine remains unknown, but the remaining 142 cases have been followed over a period varying from three to seven years (Table II).

TABLE II.—*Method of Follow-up Examination in 151 Patients*

Patients known to have died of non-related causes ..	12
.. readmitted for subsequent symptoms ..	15
.. attending for out-patient interview and subsequently volunteering for barium-meal studies ..	90
Patients reporting by letter alone ..	25
.. not traced ..	9

Results

In Table III are listed the subsequent diagnoses which have been made and which may have accounted for the original haemorrhage.

It would appear that in about a quarter of the cases of intestinal bleeding in which no lesion is detected at the time of haemorrhage subsequent investigations will reveal what may have been the cause. Perhaps of equal interest are the remaining 77% of patients who

TABLE III.—*Lesions Subsequently Found in 142 Patients Followed Up*

No subsequent diagnosis achieved	..	..	..	109
Subsequent lesion found	..	..	..	33
<i>Type of Lesion Found</i>				
		M.	F.	
Peptic ulcers	{ Chronic gastric ulcer	..	2	.. 2
	.. duodenal	..	10	.. 7
Malignant neoplasm	{ Carcinoma of stomach	..	3	.. 1
	.. colon	..	1	.. 2
	.. pancreas	..	1	.. 0
	.. small intestine	..	0	.. 2
Miscellaneous	{ Meckel's diverticulum	..	1	.. 0
	Hereditary haemorrhagic telangiectasia	..	0	.. 1

never have an adequate cause for their haemorrhage demonstrated and who must remain a diagnostic mystery or be labelled with speculative diagnoses such as "gastritis" or "acute gastric erosion."

Peptic Ulcer Group

The most common cause found in patients with gastro-intestinal bleeding of obscure origin when re-examined or readmitted was peptic ulceration. This occurred in 21 patients, with 4 gastric ulcers and 17

duodenal ulcers, thus reflecting the usual excess of duodenal ulcer. It is assumed that the initial haemorrhages may have been due to acute gastric or duodenal erosions undetectable by x-ray examination, and it is possible that these lesions may later progress to chronic gastric and duodenal ulcers. In a follow-up of patients with acute gastric ulcers Avery Jones and King (1953) have shown by gastroscopic examination that males in particular tend to return with chronic gastric ulcers. Probably what applies to the stomach may also apply to the duodenum and to acute duodenal lesions, which presumably occur not infrequently in patients with gastro-intestinal bleeding and progress to identifiable duodenal ulcers.

Neoplasm

No fewer than 10 patients were subsequently shown to be suffering from malignant neoplasm of the stomach in 4, the colon in 3, the pancreas in 1, and the small intestine in 2. In a similar follow-up study in Sweden, Birke and Engstedt (1956) found 24 patients with malignant tumours among 191 in whom the source of bleeding had not been determined during the initial stay in hospital.

Gastric Carcinoma.—In a review of 305 patients with gastric carcinoma who underwent gastroscopy LaDue *et al.* (1950) showed that examination with the flexible gastroscope was nearly as successful as radiology in the detection of the growth, and when both methods were used 96% of lesions showed an abnormality in one or other of these methods. Carcinoma in the fundus of the stomach may easily be overlooked on radiological examination. A soft-tissue mass is occasionally seen to deform the gastric air bubble, but barium may sink below the lesion quickly and its presence may therefore not be detected. It is in such a situation that gastroscopy can be of value, as the gastric fundus is well visualized; a fundal neoplasm must not be missed, as such growths may be as amenable to surgical removal as those nearer the pylorus.

Growths in the more distal parts of the stomach tend to be more readily detectable on barium-meal examination, and gastroscopy is less likely than radiology to detect lesions in this situation. It is therefore of some interest to re-examine the evidence in the four cases subsequently found to have gastric neoplasm. Two of the patients were not gastroscopied, and in the other two abnormalities were noted but the wrong conclusions had been drawn. In one case, that of a man of 66, the significance of the "coarse folds" seen gastroscopically was not appreciated at the time; in the second the presence of a subsequently proved duodenal ulcer and the appearance of mammillation of the gastric mucosa (a common finding with the hypersecreting stomach in duodenal ulcer) misled the clinicians into believing that intestinal bleeding was probably from a duodenal ulcer, whereas a gastric carcinoma may have been present.

Pancreatic or Ampullary Carcinoma.—The erosion of a pancreatic or ampullary neoplasm into the duodenum may cause frank alimentary bleeding. Rarely, the invasion and the occlusion of the splenic vein by such lesions may cause haemorrhage from oesophageal varices. Unfortunately, the detection of pancreatic neoplasm without jaundice may be difficult, and in the absence of radiological evidence the help afforded by tests of pancreatic function may be restricted. With an ampullary carcinoma there may

be intermittent pale stools, and bleeding may impart a peculiar silvery appearance to the stool. The alkaline phosphatase is often raised, with ampullary obstruction, and intravenous cholangiography may show dilated bile ducts.

Tumours of Small Intestine.—One patient, a woman aged 65, who bled in 1952, returned in 1957 with iron-deficiency anaemia and later with vomiting, and was found to have carcinoma of the jejunum. The second patient was a woman aged 52 who bled in 1950 and had a further melaena later the same year and again in 1951. At laparotomy a leiomyoma of the duodeno-jejunal junction was found.

Carcinoma of Colon.—Melaena may arise from a right-sided large-bowel tumour, but a carcinoma anywhere may result in activation of a peptic ulcer. The really difficult diagnostic cases are those in which a duodenal deformity is noted radiographically and the colonic lesion missed altogether unless looked for because of persisting occult blood in the stools, low-grade fever, and a raised E.S.R.

Other Less Common Causes of Bleeding

The follow-up study of these 142 cases did not uncover all the rare causes of bleeding, and the following causes are briefly noted to encourage the constant vigilance needed to establish an accurate final diagnosis. Most of these less common causes have now been detected in our main hospital series.

General medical conditions include pseudoxanthoma elasticum, food allergy, periarteritis nodosa, Henoch-Schönlein disease, malignant hypertension, chronic nephritis, myelomatosis, amyloidosis, those associated with cerebral vascular accidents, and factitious or self-inflicted lesions.

Pseudoxanthoma elasticum (Grönblad-Strandberg syndrome) is a disease characterized by widespread abiotrophy of elastic tissue throughout the body. The salient features are: (1) The appearance of angioid streaks in the retina. (2) The development of laxity of the skin, particularly in the neck, axilla, and groin. There is a yellowish discoloration of the skin in these regions, hence the term "pseudoxanthoma." Histological changes show fragmentation of elastic tissue with calcification. (3) Visceral manifestations which include recurrent alimentary bleeding from rupture of a blood vessel in the stomach or intestine. The diagnosis may be suspected from the characteristic appearance and elasticity of the skin of the neck and axilla. No cases were diagnosed in the main series, but three have been seen when investigated after a haemorrhage elsewhere.

Food allergy also has not been specifically diagnosed in this series, but one individual is known to us who has had a haematemesis every time he has eaten onions. The relationship between general medical conditions and alimentary bleeding has been well reviewed by Brick and Jeghers (1955).

The possibility of blood diseases must always be carefully considered. Haemophilia, thrombocytopenia, thrombasthenia, and myelosclerosis may not present any real diagnostic problems, but von Willebrand's disease may do so. This is a familial bleeding tendency inherited as a dominant. Nose-bleeding and easy bruising are common manifestations, but gastro-intestinal haemorrhage occurs in about 15% of patients. Excessive bleeding may occur from cuts, but operations are usually not complicated by serious bleeding. The

diagnosis should be considered particularly in patients with recurrent episodes of bleeding in whom there is a history of easy bruising and in whom there is a family history of bleeding. These patients have a normal platelet count and morphology, and normal clotting, clot retraction, and prothrombin time. The abnormal findings are a positive Hess test in about half the cases. Bleeding-time is variable at different times and at different sites, but is greater than 15 minutes at some time in most patients. The antihaemophilic globulin in many patients is low and within mild haemophilic range, and the prothrombin consumption is poor in half of them. Sometimes the capillary morphology with contraction is abnormal. It is a disorder which has some features suggesting a disturbed clotting mechanism (low antihaemophilic globulin and abnormal prothrombin consumption) and some features suggesting a capillary with platelet defect (prolonged bleeding-time and positive Hess test).

Rare Local Alimentary Causes

Simple tumours of the alimentary tract are a small but important group. Leiomyomata may occur in the small intestine as well as in the stomach, where they are usually easily diagnosed. In the small intestine, however, they may easily escape detection. In one patient it was found only at the third laparotomy performed at the time of bleeding and when bleeding into the tumour made it palpable for the first time at the duodeno-jejunal junction. Neurofibromata are even more rare, but skin lesions may indicate their possible presence.

There are two important groups of diverticula of the alimentary canal—Meckel's diverticula and colonic diverticula. The presence of red blood with a melaena stool is an important pointer towards the possibility of bleeding from a Meckel's diverticulum, and localized tenderness in the lower abdomen, particularly on the right side, is confirmatory evidence. The presence of a Meckel's diverticulum does not mean that it has been the cause of bleeding, and some evidence of associated peptic ulceration is needed. In one patient in whom a Meckel's diverticulum was discovered the cause of bleeding was finally diagnosed as a rare bleeding diathesis.

Brisk severe bleeding with passage of red blood will occur from a bleeding colonic diverticulum. The haemorrhage in such cases probably occurs from a small abscess in relation to the diverticulum. The bleeding may be severe enough to need urgent laparotomy. Diverticula in the oesophagus, stomach, duodenum, and small intestine are usually incidental findings, and some other cause for the bleeding should be sought for, but occasionally it may be possible to prove that a duodenal diverticulum or an intestinal diverticulum with enteroliths has caused the haemorrhage. Herrington (1958) reports a case of massive haemorrhage from benign ulceration in a primary duodenal diverticulum.

Local vascular causes affecting arteries, veins, or capillaries are occasional causes of serious gastro-intestinal bleeding. Arteriosclerosis of gastric arteries is uncommon (Osborn, 1954) and is not normally found in the exposed vessels in the floor of ulcers. Nevertheless, gross localized tortuosity of gastric arteries may occur with extrusion of a vessel through the mucosa. One such case in this series was diagnosed

gastroscopically. This type of cirroid aneurysm has been reported by Donaldson and Hamlin (1950). True aneurysms, arteriosclerotic, mycotic, or syphilitic, are all occasional causes when eroding the alimentary tract. An aneurysm bleeding into the biliary tract may also cause haematemesis and melaena. Aneurysm of the hepatic artery rupturing into the bile duct has been reported by Malloy and Jason (1942), Gordon-Taylor (1943), and McGregor (1952). In these patients pain simulating gall-stones, haematemesis, and jaundice may occur as a triad. Severe bleeding can also be associated with a fistula between a gall-bladder containing calculi and the duodenum (Moore, 1952). This can be associated with acute duodenal obstruction. Other rare causes of bleeding into the alimentary tract from biliary and pancreatic sources have been recorded by Kerr, Mensh, and Gould (1950).

Hereditary haemorrhagic telangiectasia, a capillary abnormality, is an occasional cause of bleeding from the stomach and intestine, usually of only mild or moderate severity, but it can be fatal. It was diagnosed twice in this series. The history of epistaxis is an important clue to its diagnosis, but a family history is not always present.

Haemangiomatosis, localized or diffuse, may cause recurrent bleeding, and five anatomical varieties are described by Kaijser (1936). Sometimes the lesions are too extensive to remove, but multiple haemangiomas in the small intestine have been removed (Heycock and Dickinson, 1951) and also from the large bowel (Babcock and Jonas, 1950). Rider, Klotz, and Kirsner (1953) have reported gastro-intestinal bleeding in a patient with venocapillary ectasia in the pyloric antrum, with large, thin-walled blood vessels in the mucosa associated with severe localized gastritis. Trauma to the oesophagus from the strain of vomiting must be kept in mind (Mallory-Weiss syndrome). These patients give a story of vomiting food first, followed by fresh blood.

Salicylates and Alimentary Bleeding

The third aspect of the problem of "x-ray negative" haemorrhages relates to the role of salicylates in precipitating alimentary bleeding. In a proportion of patients in whom a barium-meal examination reveals no abnormality, it has been known for some years that there is the possibility that acetylsalicylates may be responsible for inducing an acute erosive lesion of the stomach. Working in this department, Alvarez and Summerskill (1958) have made a very careful study of this subject by extracting an accurate history of salicylate consumption before 103 admissions for gastro-duodenal bleeding and comparing it with an out-patient control group. Their control group consisted of patients attending the hospital for investigation of dyspepsia, and the pattern of ulcer dyspepsia corresponded very closely with the final diagnosis of patients admitted for haematemesis. If the ulcer-prone cases are more likely to be upset by salicylates than the non-ulcer group, this is clearly a much better control group than other emergency admissions. They found that 49 out of 103 admissions for haematemesis and melaena had taken a salicylate preparation during the 24 hours preceding admission, compared with only 7 of the out-patient control group. Detailed inquiry about the reason for taking aspirin did not suggest that the symptoms of bleeding accounted for this excess. Further confirmation of the possible adverse local

gastric effect of salicylates came from their observations of the effect of salicylates on the stools when tested for occult blood, and it was noted that aspirin produced a much higher proportion of positive stools than other non-salicylate analgesics.

It was concluded that aspirin plays a definite part in precipitating gastro-duodenal bleeding, confirming the previous studies of Muir and Cossar (1955), and that this mechanism makes a significant contribution to the number of "x-ray negative" admissions for haematemesis and melaena, perhaps even as much as 40% of this group.

Investigation of Gastro-intestinal Bleeding of Obscure Origin

The clinician is not infrequently placed in a situation where the routine clinical procedures and investigations have failed to reveal the cause of bleeding.

The personal history should be reviewed to find out if there had been any major emotional crisis in the few days preceding the bleeding—a common finding with acute ulcers. The next step is to check carefully the patient's history and family history for a tendency to bleed, and the possibility of recent medication with aspirin, cortisone, or phenylbutazone must be ascertained. The mode of onset of bleeding should be recapitulated, with special thought to the possibility of Mallory-Weiss syndrome or Meckel's diverticulum. The physical examination of the patient should be repeated, looking with great care for any cutaneous evidence of cirrhosis hepatis. Splenomegaly is a constant accompaniment of portal hypertension and is masked only by obesity or ascites, and in itself raises the possibility of cirrhosis hepatis. The skin should be inspected for evidence of congenital defects such as pseudoxanthoma elasticum, neurofibromatosis, or haemangiomata. The elasticity of the skin of the axilla and neck should be specially noted.

The possibility of hiatus hernia may need further checking if the radiological report is incomplete in this respect. The need for gastroscopy should be borne in mind.

The extent of further investigation will rest mainly on the clinical review of the case, and one will be biased in favour if the history has any unusual features, such as atypical pain and loss of weight. The most important indication for further x-ray examination and endoscopy is the finding of persistently positive occult blood in the stools. This will need further barium-meal, small-intestine meal, and barium-enema studies and liver-function tests. A raised alkaline phosphatase and dilated bile ducts may be found associated with an ampullary carcinoma. If there is still no indication of the cause of bleeding, some information about the level of origin may be obtained by swallowing radio-opaque string (Rappaport, 1955) overnight or by sampling the small intestine at various levels with a Miller-Abbott tube. With unexplained and persistently positive stools it is really necessary to proceed to a laparotomy. When there have been repeated episodes of bleeding it is preferable to wait for a further episode and then to undertake laparotomy at the time of bleeding. It is most important that the stomach should be opened and carefully inspected at the time of operation. It is often quite impossible to feel acute ulcers from the peritoneal surface. Sometimes the exposed vessel may be felt like a lead shot on palpation of the mucosa through a gastrostomy.

Summary

A follow-up is presented of cases of x-ray negative haematemesis and/or melaena. Among 142 patients followed up for three to eight years there were 33 (23%) in whom a positive diagnosis was subsequently made and which may have explained the original episode.

The diagnoses subsequently made were chronic gastric ulcer in 4, duodenal ulcer in 17, carcinoma of stomach in 4, carcinoma of colon in 3, carcinoma of pancreas in 1, carcinoma of small intestine in 2, Meckel's diverticulum in 1, hereditary haemorrhagic telangiectasia in 1.

Among the less common causes special attention is drawn to pseudoxanthoma elasticum, von Willebrand's disease, diverticulosis of the colon, and the Mallory-Weiss syndrome.

Aspirin is thought to play a very significant aetiological part.

The method of investigation of these cases is discussed in detail.

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"It followed naturally that the [New Mental Health] Bill took shape from [the Royal Commission's] recommendations; and now the title has arisen from the common euphemism of saying 'health' when we mean 'illness'; one M.P. in fact said, 'There are few subjects which cause so much distress to so many people as mental health.' (Euphemisms were of course well known to the Greeks, who called the Furies the Eumenides or kindly ones.) To object to this may seem trivial and hair-splitting. But it is in fact highly important, for there is a danger that many members of the public, and perhaps even Members of Parliament, will be misled by the title into a state of complacent satisfaction that they have now produced a finer mental health service than any other country—and therefore need do no more. They are in process, no doubt, of improving the service for mental illness: but no service for mental health exists yet, and the Bill makes no real proposals towards it. (The Greeks did not deceive themselves that the Furies really were kindly.)" (Editorial, *Mental Health*, **18**, 1.)

POST-VAGOTOMY DIARRHOEA:
ITS CAUSE AND PREVENTION

BY

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Long-term studies of the results of vagotomy with gastric drainage (Burge and Pick, 1958) have shown that the operation is better than gastrectomy in the surgical treatment of chronic duodenal ulcer. In their work these authors found that a change in bowel habit after vagotomy was the only feature which could possibly detract from the operation. Of their patients 30% showed some small change on direct questioning. Many patients were previously constipated and welcomed the slight looseness which followed operation. Others, however, found themselves confronted with a real disability marked by early morning diarrhoea with urgency. A few have shown severe disabling diarrhoea. Our own long-term studies prove that in most cases the symptom is permanent. At one time we felt that, because of post-operative diarrhoea, the operation of vagotomy might not come to take its place as the standard surgical procedure.

Up to now the cause of this diarrhoea has been unknown. Most authors have believed that these symptoms are due to infection consequent upon gastric hypoacidity or to gastric stasis.

During our studies we found that extirpation of the coeliac plexus in the dog caused diarrhoea (Von Mering and Aldehoff, 1899). It seemed to us that vagal denervation of the coeliac plexus might be the cause of post-vagotomy diarrhoea in man.

No worker has published, as we do now, two series of cases, one with the coeliac division of the posterior vagus intact and the other with the vagal supply of the coeliac plexus interrupted by division of the posterior vagus above the origin of its coeliac branch.

We have found by stimulation tests (Burge and Vane, 1958) in animals and on man that preservation of the coeliac division of the posterior vagus does not interfere with complete gastric vagotomy.

Although a few important papers have described the anatomy of the abdominal vagus (McCrea, 1924, 1926), our own dissections in the post-mortem room have brought to light anomalies, not mentioned in these papers, which are important now that vagotomy has become the standard surgical procedure.

We have found that the coeliac division of the posterior vagus usually arises at a level below the gastric cardia (Fig. 1). In this case when the posterior vagus nerve is divided denervation of the coeliac plexus must occur. Sometimes the coeliac branch was found to arise at a higher level, though still below the diaphragm (Fig. 2). In such a case it would seem possible that when a posterior nerve trunk is overlooked the coeliac innervation may be preserved. In some cases we found that the coeliac division arose within the chest and passed, closely applied to the abdominal wall, the coeliac plexus (Fig. 3). It seems likely that this nerve must sometimes