AN INVESTIGATION OF ABDOMINAL DISEASE IN GENERAL PRACTICE; WITH SPECIAL REFERENCE TO DYSPEPSIA OF ORGANIC ORIGIN.

Thesis submitted for the

M.D. GLASGOW.

by

John McIntosh Morgan.

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ProQuest LLC.
789 East Eisenhower Parkway
P.O. Box 1346
Ann Arbor, MI 48106 – 1346

An investigation of abdominal disease in general practice: with special reference to dyspepsia of organic origin.

INTRODUCTION.

The investigation which is recorded in the following pages is based on the study of five hundred consecutive cases - both acute and chronic - in which the patients presented themselves with abdominal symptoms. All occurred in general practice.

I have given the term dyspepsia a rather wide interpretation, and have included in the series, all cases where the complaint was referred to as being gastric or abdominal in nature. (Cases arising in children and cases of pregnancy have been excluded.)

I find on analysing the causes, that they fall roughly into the following groups:-

Organic diseases of the stomach.

Functional diseases of the stomach.

Diseases of the intestines or appendages.

Diseases primarily external to the gastro-intestinal tract but in which the symptoms - in many cases reflex- have been referred to the abdomen.

Patients suffering from dyspepsia of organic origin are specially considered, this being held to include cases of gastric and duodenal ulcer and of carcinoma of the stomach.

Thereafter, I propose to present a more summary review of the remaining conditions which have occurred in the series.

A great deal of difficulty which the practitioner has in dealing with dyspepsia is due to its being an ill-defined condition, not easy to classify. Literally, of course, the term means "bad digestion", but it is perhaps best to define it as "discomfort of any kind arising during the process of digestion".

This may be the result either of organic disease of the stomach or of primary disorder of its function, while it may also be closely simulated by referred pain from other organs; or secondary to organic disease elsewhere.

It follows that the first step in the diagnosis of a case presenting gastric symptoms, is a general examination to exclude the possibility of the simulation of dyspepsia by disease elsewhere than in the stomach. Ryle (1) for example, finds that 50% of dyspepsias are

due to extra gastric causes of a general kind, while Soltau Fenwick (2) enumerates causes arising in lungs, heart, kidney, liver, and elsewhere.

In this series 8% of cases were due to diseases outwith the digestive system.

The gastric symptoms associated with such conditions as migraine, the crisis of tabes, angina or uraemia, are often sources of error; and it is becoming more and more apparent as time goes on, that in many cases, the gastric symptoms are really being set up by disease in some other abdominal organ, such as the appendix, gall-bladder, or colon. Further, recent advances in our knowledge all go to show that many more cases than were formerly supposed, are due to organic dyspepsia, and that careful, prolonged observation is necessary before a case is relegated to the category of functional dyspepsia.

It has been indicated that dyspepsia is a symptom in many diseases, and the variety of these which may have to be considered is indicated by Table 1, - showing the ultimate diagnosis in 500 cases.

In my opinion, a wider outlook has to be taken in general practice than in hospital or special practice, as patients are seen at an earlier stage , and are more

Table 1.

Analysis of Causes - 500 Cases.

	No. of Cases.
Gastric Ulcer.	25
Jejunal Ulcer.	3
Duodenal Ulcer.	30
Carcinoma of Stomach.	14
Gall-stones and Cholecystitis.	12
Chronic Appendicitis.	19
Enteroptosis.	13
Acute Appendicitis.	22
Jaundice (Catarrhal)	8
Acute Gastritis.	85
Chronic Gastritis.	27
Hyperchlorhydria.	40
Dyspepsia associated with vitamin deficiency.	52
Nervous Dyspepsia.	20
Dyspepsia at Menopause.	18
Acute dilatation of Stomach.	4
Intestinal Obstruction due to	
(a) tumour.	8
(b) other causes.	3
Gastric Syphilis.	5
Lienteric Diarrhoea.	3
Diverticulitis.	4
Carcinoma of Oesophagus.	5
Pernicious anaemia.	3
Brain Tumour.	2
Worms.	4
Migraine.	3
Tobacco poisoning.	1
Uraemia (chronic)	8
Acute nephritis.	6
Angina pectoris.	8
Infleunza.	24
Dysentery.	3
Tuberculosis.	3
Diabetes.	1
Dietl's crisis.	2
Pyelitis.	3
Cirrhosis of Liver.	2
Lead Poisoning.	1
Gynaecological	6
fibroid (3) ovarian cyst (1)	
ectopic pregnancy (2)	

liable to be treated only symptomatically, and it is only when more serious symptoms supervene that a more general investigation is undertaken.

Gall-stones, for example, may cause only mild symptoms such as flatulence for months, or even years, and a fair measure of relief is obtained from dieting, carminatives etc., but when pain creeps in as a symptom, the full diagnostic armamentarium is requisitioned.

Angina pectoris is often thought by both patient and doctor to be dyspepsia - relieved by eructation of gas and passing off quickly as so often occurs - but when its attacks become more frequent and severe, its true significance becomes apparent.

This I think explains to a large extent the rather suprising length of Table 1. It early becomes impressed on one that in general practice cases cannot readily be so fully investigated as he could wish. Apart from consideration of ones own time, e.g. a fractional analysis taking about three hours - the patients time must be considered. An X-ray examination at hospital means a days wages lost, and is not readily consented to in early cases. A test meal is quite often refused point blank, especially in mild or early cases.

The methods of investigation I have tried to follow on which to base a diagnosis have been in as many cases as possible.

1 Personal history of illness.

2 Physical examination of abdomen.

3 Chemical examination of stomach contents and faeces.

4 Examination by X-rays.

5 General examination to exclude other diseases.

6 Examination for possible foci of infection.

The diagnosis has, in many cases, been confirmed by operation.

1. Personal history of illness.

A.J. Walton (3) states that "of the methods of investigation of dyspepsia a carefully detailed history will be found the most valuable", and my own experience bears this out.

Duodenal ulcer, for example, can almost invariably be diagnosed from history alone.

A history of regular pain associated with dyspepsia is more likely to be due to reflex causes, from gall-bladder, appendix, or colon, than to ulcer.

Diseases of other systems are often indicated from the history. As regards individual symptoms to which attention has been paid a brief résumé of the reasons for this may be indicated.

Age: This is of chief importance where the possibility of carcinoma exists: it is of less importance in the diagnosis of ulcer and gall-stones,

Sex: To ascertain its incidence in gastric and duodenal ulcer more particularly, as also in gall-stones and visceroptosis.

Occupation: The number of cases appears to be too small for this to become a factor: McLennan (4) has pointed out the special liability of sedentary workers to digestive derangement.

Poisoning by lead and arsenic may have to be excluded in those whose occupation entails their use.

Family history: Is mentioned only where it exists as a possible predisposing cause. Dreschfeld (5) quotes 8 cases with a family history of gastric ulcer.

Diet: Over-eating, hurried and irregular meals and over-indulgence in alcohol are obvious exciting causes of dyspepsia, and need only be mentioned, although in treatment they are all important.

Certain subjects of dyspepsia would seem to take a diet deficient in vitamins.

History of the illness: duration: mode of onset: periodicity of attacks, have been noted for purposes of differential diagnosis.

Pain: as regards severity, position, radiation, and relationship to food.

Vomiting: as regards frequency, quantity and relief to pain.

Appetite: has been noted as to its incidence in cases of ulcer and carcinoma.
Walton (6) and Mayo(7) have called attention to the fact that patients with gastric ulcer, while having a good appetite are "afraid to eat" on account of pain. This symptom has been noted.

Bowels: to indicate the incidence of constipation.
State of nutrition: to note its importance as a diagnostic sign.

Build: Attention has been paid to this on account of the reported association by Campbell and Conybeare (8) of hyperacity and hypertonus with the sthenic type of individual and the reverse.

Physical examination has been on ordinary clinical lines.

Examination of stomach contents.

In as many cases as possible a test meal has been given and examined. The method chiefly employed has been the one hour test meal of Ewald (9), and to a limited extent the fractional method of Rehfuss (10).

I have not had time to pursue the fractional method to any extent, helpers have proved unreliable, and a period of three hours is impracticable.

I have found that in suspected cases of carcinoma it is sufficient to examine the resting juice for evidence of retention and of blood, and then to examine the test meal one hour later.

The withdrawn meals have been examined for the presence or absence of free hydrochloric acid, and for total acidity, lactic acid tested for, and any abnormality in appearances noted. Blood, occult and otherwise has been looked for, and on occasion microscopic examination employed.

The faeces have been examined for the presence of melaena, on account of its great importance in the diagnosis of organic conditions of the stomach (Hurst) (11).

X-ray Examination:

As this subject is so wide in itself I have confined my observations on this practically to the pathological findings as they have arisen.

Attention has been directed chiefly as regards the stomach to:-

1 Position.

2 Filling defects, ulcer craters etc.

3 Emptying rate.

4 Formation of duodenal cap.

Further examination of the intestinal tract has been carried out when considered necessary.

Examination of other systems by suitable methods has been carried out to exclude causes arising outside the gastro-intestinal system.

Examination for septic foci.

As several writers (Watson Williams and Peckworth) (12), Kletz(13), Haden and Bohan (14), have pointed out the impertance of foci of infection as a probable cause of ulcer, a look out has to be kept for them. Teeth, tonsils and maxillary antra (transillumination) have been examined

in most cases.

This survey, as I have pointed out, is thus a clinical one, and such as may be carried out by a general practitioner with the exception of X-ray examination.

It is proposed

(1) to review the cases generally.

(2) to consider cases of peptic ulcer and of carcinoma in more detail.

(3) comment more briefly on other cases.

<u>With reference to Table 1</u>.

The variety of causes of abdominal symptoms is at once apparent and merely calls for comment.

The incidence of organic causes is of interest.

Peptic ulcer accounts for 11.6% of cases,

Gastric ulcer 5%

Duodenal ulcer 6%

Jejunal 0.6%

Carcinoma of the stomach accounts for 3% which gives a total of 14.6% of cases due to organic disease of the stomach.

Gall-stones, chronic appendicitis and enteroptosis are now well recognised as causes of dyspeptic

symptoms - possibly reflex - probably causing gastritis from infection.

Gall-stones account for	2.4% of cases
Chronic appendicitis	3.8% " "
Enteroptosis	2.6% " "

Thus well-recognised pathological causes of dyspepsia account for approximately 23% of all cases.

This seems a large percentage, and inclines one to take the view that few cases of dyspepsia due to secretory disorders exist, and that as diagnosis improves more and more cases will turn out to be organic.

The importance of causes external to the gastro-intestinal tract is evidenced by the fact that 8.6% of all cases are in this category. Many of these may be cases of gastritis, but secondary to other conditions.

It is, of course, in the more chronic cases that difficulty in diagnosis chiefly lies, and that from the point of view of prognosis and treatment recognition is most important.

In the past, many cases have been labelled chronic dyspepsia, and allowed to drift, receiving only palliative treatment, when recognition and appropriate

treatment, e.g. of gall-stones and chronic appendicitis would have meant a restoration to health.

In cases arising external to the gastro-intestinal tract the orientation of treatment may be completely changed.

After consideration of the chronic cases from Table 1 it is found that 41% of them have a definite organic cause.

Peptic Ulcer	22.5%
Carcinoma	6%
Gall-stones	5%
Chronic appendicitis	8%

Gastric and Duodenal (Peptic) Ulcer.

For purposes of discussion and comparison I have considered it more appropriate to review Gastric and Duodenal ulcer cases together.

In this series there are 55 cases of peptic ulcer - 25 gastric and 30 of duodenal ulcer; duodenal being rather the more common in practice, perhaps on account of its more easy recognition.

Sex Incidence.

(a) Gastric Ulcer.

Males - 6 = 24%
Females -19 = 76%

This bears out the more generally accepted finding that the incidence of gastric ulcer is greater in females, Brinton (15) from post mortem findings gives an incidence of two females to one male; Matthew (16) of males 30% females 70%. Several recent writers have found the male incidence greater than the female. Broster (17) records male 75%. female 25%; and Souttar (18) males 70% females 30%.

Walton (19) regards acute ulcer as more common in females, due to the prevalence in young women of ulcer associated with chlorosis, he, however, gives findings in chronic ulcer as 71% males as also does Mayo(20).

(b) Duodenal Ulcer.

Males. - 22 = 73%
Females. - 8 = 27%

Duodenal ulcer is unanimously found to be more prevalent in man, Matthew (16) for example finds in a series of 64 cases, 58 male and 6 female, Young (21) males 37, females 8, in a series of 45 cases.

The percentage incidence of gastric and duodenal ulcer is approximately 45% of Gastric and 55% of duodenal. Matthew (16) finds the incidence 41% and 59% respectively and Peck (22) found that 73% of ulcers were duodenal. The number of cases in this series is perhaps too small for comparison but would seem to differ little in the above respects from those of other observers.

Age.

I have found the age of onset of symptoms to be difficult to determine with any degree of accuracy, as the long duration in many cases along with their insidious commencement, makes a statement of the date of onset rather unreliable. The duration in this series varies from a short period to 35 years.

The average age in cases of Gastric ulcer is 33 years; males 41 years; females 25 years, and in Duodenal ulcer 38 years; males 40 years, females 36 years. According to Martin (23) the age of onset is in the decade 20 - 30 years, and to Broster (24) in the third and fourth decades. I find the age of onset of gastric rather earlier than that of duodenal ulcer,

being the reverse of Brosters finding.

Occupation.

This varies so much in this series that no inference of any value can be drawn.

State of nutrition.

Gastric Ulcer.	Good	= 12	=	48%
	Fair	= 5	=	20%
	Poor	= 8	=	32%
Duodenal Ulcer.	Good	= 4	=	13%
	Fair	= 16	=	54%
	Poor	= 10	=	33%

Nourishment of itself would appear to be of no direct significance. The chronic patients are noticeably the more poorly nourished, probably on account of a prolonged low dietary; and in gastric ulcer cases associated with vomiting, due to this cause.

Most of my patients who have been the subject of duodenal ulcer have been noticeably spare, and rather undernourished. This is the opposite of Waltons (19) finding; he attributes the good state of nourishment to the increased appetite which is common in this condition.

Appetite.

Gastric ulcer.	Good	= 9	=	36%
	Fair	= 7	=	28%
	Poor	= 9	=	36%
Duodenal ulcer.	Good	= 22	=	72%
	Fair	= 6	=	20%
	Poor	= 2	=	8%

Increased appetite is therefore more characteristic of duodenal ulcer than of gastric. This is attributed by most writers to the characteristic Hyper-chlorhydria; but in view of the work of Carlson (26) on hunger is more probably due to the hypertonus.

A number of writers, e.g. Bolton (27) and Walton (6) have pointed out that while some patients with gastric ulcer have a good appetite, many are afraid to eat on account of the pain, which experience has taught them, will follow.

This symptom I have found to be very useful in aiding the diagnosis of Gastric ulcer. It was present in 20 or 80% of my cases. It was present in only four cases of duodenal ulcer or 13%. One of these was associated with gastric ulcer.

Condition of the Bowels.

Constipation was a feature in 80% of Gastric ulcer cases and of 33% of Duodenal. This may be partly attributed as Broster (24) suggests to the habit of taking bismuth. Such patients also take a good deal of milk food and avoid roughage, which may help to aggravate the condition. Gastric ulcer patients also often belong to the hypotonic type of individual in whom colon stasis tends to be present.

Heredity.

In only two cases of this series was there a definite history of a possible family diathesis. Each of these was a

case of duodenal ulcer, who had a brother operated on for a similar complaint.

One male patient with duodenal ulcer had a child with pyloric stenosis - possibly a hereditary hypertonus.

In several instances there was a family history of "indigestion" too indefinite on which to base a diagnosis, I incline to agree with Smith (28) that the heredity lies rather in the habits than in the tendency to ulcer.

Dietetic Habits.

Gastric Ulcer - Bad =	16 =	64%
Not abnormal =	9 =	36%
Duodenal Ulcer - Bad =	24 =	80%
Not abnormal =	6 =	20%

In estimating dietetic habits there is obviously some difficulty, as there are so many paths of deviation from the normal.

Irregular and Hurried meals: 23 cases or 42% came under this category which is probably the most common exciting cause. This includes carried meals - e.g. outdoor workers, railwaymen, etc., and rushed meals in the case of these with a short dinner hour. Amongst women sufferers I have found that tea drinking and excessive pastry eating are almost always present, but as these are habits of the female sex in general it cannot be stressed. It is interesting to note that this habit tends to affect the periodicity of the pain in female patients.

As pointed out by Wilkie (29) these "catch meals" are often responsible for an atypical story. Deficiency of vitamin intake is also too much a feature of the habits of the general population to be introduced as a contributing factor. Again, the habits of taking tinned food, pies, pastry, condiments, twice cooked meals, tea with meat, etc., are so general that they can only be regarded as aggravating causes.

Alcoholic excess could be regarded as a possible cause in three cases only.

Tobacco. 12 patients or 21% admitted to smoking over 3 oz. of tobacco per week. Moynihan (30) has shown by actual fractional test meals, that smoking increases the secretion of acid. In view of this, and from the ascertained clinical fact that smoking aggravates symptoms, it seems an obvious aggravating cause.

This applies also to the dietetic indiscretions commented on; many if not most sufferers can keep their symptoms in check by careful dieting. This seems to me the most satisfactory proof of the importance of diet as a cause at least predisposing to ulcer.

Focal Infections. I have noted the following in this series:-

Teeth. Dental caries present in 75%. Pyorrhoea or unhealthy gums in 56%. Antrum infection in one case

Endocervicitis (leucorrhoea) in one case. Cholecystitis with gall-stones in one case. Tonsillitis (chronic follicular) in five cases. Chronic appendicitis in two cases. One case was associated with rheumatoid arthritis.

I think dental caries alone to be unimportant unless from the point of view of imperfect mastication.

It is more likely that unhealthy gums - pyorrhoea or gingivitis - may give rise to infection either swallowed or blood-borne. Direct infection of the gastric mucosa occurs in gastritis, and Knud Faber (31) considers that it is in gastritis that we must seek the origin of gastric ulcer. He stresses the frequency of prepyloric gastritis in ulcer cases.

The opinion seems to be more generally held that peptic ulcer is due to a blood borne infection settling in the lymph follicles of the stomach and duodenum. Wilkie (32) subscribes to this view: Kletz (33) supports the view that material is carried from foci of latent infection causing primary emboli in the end arteries of the stomach and duodenum, Rosenow (34) in experiments on animals by injecting streptococci, succeeded in producing ulcer in a large percent of cases.

Thus a considerable number of cases have an associated septic condition capable of giving rise to infection, carried either directly or by means of the blood stream.

Onset.

Gastric Ulcer. The onset in gastric ulcer has usually been insidious. It is almost unanimously found in chronic cases that one or more attacks of flatulent dyspepsia have preceded attacks in which pain was a feature. This makes it possible to believe that gastritis may precede or predispose to ulcer.

On the other hand in two cases there has been a sudden onset with haemorrhage and with only slight previous flatulent dyspepsia, and in four cases of haemorrhage no previous medical advice had been sought. Only one perforation occurs in this series, and in this there was no history of pain; flatulence only being present. It would appear then that pain in the very early stages is not necessarily a feature of gastric ulcer, but is preceeded by a dyspepsia in which flatulence and a feeling of discomfort are the main symptoms.

Duodenal Ulcer. In this pain is an earlier and more constant symptom. In the earlier attacks it tends to be described as burning or heart-burn. Later attacks are attended by pain of more pronounced severity. In this series - with the exception of one case of haemorrhage the history of onset was a gradual one.

Duration of Attacks.

The periodicity of attacks is so well recognised a feature of ulcer and so almost constantly present, that it scarcely calls for remark, as Bull (35) has so well put it, "it is a special feature of the symptoms of peptic ulcer to remit and relapse until finally the attacks become continuous".

As regards duration of attacks, I find it quite impossible to give an average with any degree of accuracy, indeed it seems of little value to attempt to do so. The chief fact elucidated is that as chronicity proceeds the symptoms tend to become more constant, attacks perhaps lasting a few days, up to about ten days, gradually extending to several weeks and later to constancy. In duodenal ulcer the attacks appear generally to be more sharply defined, and to have less tendency to constancy, except where adhesions or pyloric stenosis are present as complications. In fact both in gastric and duodenal ulcer, absence of remission of symptoms would appear to indicate complications.

Remissions.

All chronic cases in this series showed remissions at some period of the history; this would appear to be characteristic of peptic ulcer. The duration of remissions seems to depend on dietetic care and on treatment.

Indiscretions in diet often precipitate recurrences. I have found it the invariable habit of patients in this series to take alkalies during attacks, chiefly sodium bicarbonate, often some preparation of bismuth. In view of the success of alkaline treatment one sometimes wonders if periodicity of symptoms is a true feature of peptic ulcer or merely a result of treatment. Hurst and Stewart (191) indicate that recurrences are sometimes due to fresh ulcer, but that chronic ulcers go through "indolent" and "active" stages.

In gastric ulcer it is not uncommon to have lesser degrees of dyspepsia between attacks of more severity; in duodenal ulcers on the other hand there is remarkable freedom from symptoms during periods of remission.

Pain.

This is unquestionably the outstanding symptom of peptic ulcer; it was present in all chronic cases in this series. It was absent in two acute cases of gastric ulcer - one where the onset was with haemorrhage, the other with perforation. It was also absent in one case of duodenal ulcer - again a case of "onset with haemorrhage".

Pain was thus a feature of approximately 95% of cases. Moynihan (36) in his clinical description of ulcer cases has indicated pain as the really important symptom: and he and Mayo Robson (37) have pointed to the rhythmic character of the pain described in gastric ulcer as food comfort, pain comfort; and in duodenal ulcer as food, comfort, pain. Broster (17) found pain in 99% of his cases, Smith (28) in 93% of male and 92% of female cases.

In the cases (5%) where pain was absent, in this series, flatulence and discomfort were present: Ryle (38) has indicated this as being a recognised feature in gastric ulcer.

The severity varies greatly, and may be summarised generally, as in gastric ulcer, varying from flatulence and discomfort to definite pain, severe and constant where adhesions or complications are present. In duodenal ulcer, the pain is generally of a more pronounced character, again more severe preceding perforation or where complications are present.

The periodicity of the pain in both gastric and duodenal ulcer is also modified by complications - thus I have found it quite atypical in the presence of pyloric stenosis, hourglass stomach, and where localised

peritoneal irritation was found present. In many cases the diagnosis can be cleared up by enquiring into the character of the pain in previous attacks, i.e. antedating the onset of complications; when the characteristic periodicity may be found to have been present. This is one of the important points in history taking.

The fact that complications affect the typical history of the pain cycle has been noted by many writers, e.g., Alexis Thomson (39); Rehfuss (40) states that stenosis, perigastritis and peritonitis may convert an intermittent into a constant pain.

Of cases in this series in which this modification was found the following were ascertained causes:-

Perforation.	3 cases.
Hourglass contraction.	2 cases.
Perigastric adhesions.	3 cases.
Pyloric stenosis.	4 cases.

Time of Onset of Pain.

In gastric ulcer this was found to vary from 10 minutes to 2 hours, and in duodenal ulcer to come on considerably later, from 1½ hours to 2½ hours. Broster (24) finds an average time in gastric ulcer of 1.7 to 2.4 hours: in duodenal ulcer of 2 to 2.4 hours.

I have found it quite impossible to correlate the time of onset with the site of the ulcer: Broster (24)

states that the time of onset corresponds with the high part of the acid curve; while Holland (41) states that pain does not correspond to the high part of the acid curve but to the time when the pars pylorica are most concerned in motor activity.

Hurst (42) has shown that pain depends on a hypertonic condition of the stomach in duodenal ulcer; and failed to produce pain in several cases of gastric ulcer after introduction of four ounces of a 0.5% solution of hydrochloric acid. He concluded that gastric pain is an expression of hypertonus, excessive peristalsis and inhibition of pyloric relaxation, all factors liable to increase intragastric tension and tension in the muscle fibre.

This is confirmed by the experimental work of Carlson (43) which demonstrated that the main element in the production of all gastric sensibility is muscular tension. This view has superseded the view that pain is due to direct irritation of the ulcer by hyperacidity or the view of Brunton (44) that it was due to hypersensitiveness of the mucous membrane. It is interesting to note that in 1903 in reporting a case of duodenal ulcer Ballantyne (45) thought that "the pain may have been caused by spasmodic contraction of the duodenum from irritation at the seat of the ulcer".

Hunger pain was present in 14 cases or 46% of Duodenal Ulcers and in only 2 cases or 8% of Gastric Ulcers. This hunger pain was invariably relieved by taking food. Pain in the absence of inflammatory complications is relieved by alkalies in the vast majority of cases. If not relieved in cases where ulcer is suspected, further review of the diagnosis is essential. The position of the pain was universally epigastric in this series. Local tenderness was present in 24% of gastric ulcer cases and 20% of duodenal ulcer cases.

In view of the work of Head (46) and McKenzie (47) an investigation of hyperalgesia was made in 8 cases of gastric ulcer and in ten of duodenal ulcer. In two cases of gastric ulcer and in one of duodenal, only was this found present, and in all cases it correspondened to the 7th, 8th and 9th thoracic segments on the left side. As all the cases in which it occurred were acute ulcers, and no estimate of their depth could be made, these findings must be considered as of no practical value.

Vomiting.

This symptom was present in

Gastric Ulcer. 13 cases = 52%

Duodenal Ulcer. 5 cases = 16%

These figures may be compared with those of Walton (48) who found vomiting present in Gastric Ulcer in 88% of cases, and in Duodenal Ulcer 8%. Broster (24) in Gastric Ulcer 88%, and Smith (28) in Gastric Ulcer 83%, in Duodenal Ulcer 22%; and Rehfuss (49) Gastric Ulcer in 66%.

In all cases vomiting relieved the pain, presumably by reducing intragastric tension and spasm. Vomiting was found to be intermittent and generally only occurred with severe pain. It was frequently induced by the patient himself. It is interesting to note that Mayo Robson (37) considers that when duodenal ulcer is accompanied by vomiting, a gastric ulcer is also present. This was so in one of my patients.

Haematemesis and Occult Blood in Test-meal.

Actual haematemesis visible to the naked eye occurred in

Gastric Ulcer 11 cases = 44%.

Duodenal Ulcer 4 cases = 14%.

Other observers have found figures which vary somewhat, thus:- McLennan (50), Gastric Ulcer 80%. Walton (48), Gastric Ulcer 28%. Duodenal Ulcer rare: Smith (28), 49% in Gastric Ulcer: none in Duodenal Ulcer. Broster (24) 30% in Gastric Ulcer: Lebert

(51) 82% in Gastric Ulcer, and Martin (23) more than 25% of all cases of Gastric Ulcer.

I cannot account for the high percentage of haemorrhage in duodenal ulcer cases in this series. In all cases in which haemorrhage occurred it was severe, and was not found in any case in which the vomiting was intermittent. Inclusion of occult blood in the test meal raised the incidence of haemorrhage in gastric ulcer to 50%, but did not affect that of duodenal ulcer.

Malaena and Occult Blood in Faeces.

The importance of the presence of occult blood in the stools was point out by Boas (52), and Hurst (11) has stressed its importance in diagnosis.

I usually place the patient on a meat free diet for three days before examining the faeces for occult blood. It was found present in 5 cases or 20% of Gastric Ulcer cases, and in 12 or 40% of Duodenal Ulcer cases. Boas (52) records 58% in peptic ulcers: Smith (28) 12.5%, Gastric Ulcers, and 56% of Duodenal Ulcers: Broster 9.8% of Gastric Ulcers and 21.2% of Duodenal.

I have found it chiefly in cases of acute ulcer, or in chronic ulcer during an exacerbation. Figures

are apt to be unreliable as in several cases it has only been found after several examinations, and would appear to be only intermittently present.

It has proved useful in cases of haemorrhage from ulcer to test for occult blood, as an indication of the arrest of bleeding. In the few cases I have examined this period has averaged 12 days. It is, of course, necessary to exclude other possible sources of haemorrhage such as piles.

Complications.

The following complications were noted in this series:-

	Cases.		
Haemorrhage	11	=	44%
Hourglass contraction.	2	=	8%
Perforation.	1	=	4%
Adhesions (perigastritis)	3	=	12%

Associated with gall stones. 1 case. = 4%
Associated with appendicitis. 2 cases. = 8%
Associated with duodenal ulcer. 2 cases. = 8%

Duodenal Ulcer.

	Cases.		
Haemorrhage.	4	=	13%
Perforation.	2	=	6.5%
Pyloric Stenosis.	5	=	16.5%
Adhesions.	3	=	10%

Associated with appendicitis 6 = 20%.

Of the eleven cases of haemorrhage complicating gastric ulcer - 5 occurred in acute ulcer, and six in chronic ulcer - one proved fatal. Of the duodenal

ulcer cases - one occurred with acute, and three with chronic ulcer - none proved fatal. In gastric ulcer the percentage closely agrees with Matthew (53) who quotes 45% as the usual average. Broster (24) gives 30% and Smith (28) approximately 40%. In duodenal ulcer Matthew found haemorrhage in 25% of cases. Most observers have found haemorrhage less common in duodenal than in gastric ulcer, but do not publish actual figures. Smith in his series had no cases of haemorrhage from duodenal ulcer. The haemorrhage in all these cases was severe; severity of haemorrhage does not necessarily imply a large ulcer. Murchison (54) as long ago as 1870 described a case of fatal haemorrhage from a small ulcer. Seen before the onset of vomiting these cases are difficult to diagnose, especially if the history of dyspepsia be indefinite. As Bolton (55) has pointed out the general symptoms are to begin with those of circulatory failure. The longest interval between collapse and onset of haematemesis in this series was 1½ hours - the diagnosis remained indefinite for that time.

In one patient who had dyspepsia with several attacks of haemorrhage, laparotomy revealed no ulcer. This was possibly a case of gastrostaxis as described by Hale-White (56); although Bolton (57) maintains that if a search be made, small ulcers will be found

to account for the bleeding. In this case the stomach was not opened.

Perforation.

In the one case of gastric ulcer in which this occurred there was but a short history of flatulence - none of pain.

Both the perforations of duodenal ulcers occurred in chronic cases - one was under active alkaline treatment. In this case the pain lost its periodic character and became increased and constant for two days. Actual perforation appeared to occur half an hour before a pre-arranged operation. At the operation there was localised peritonitis. In the second case the patient had tired of restrictions. Diagnosis of perforation in all cases was easy, the symptoms being typical.

Hour-glass contraction.

The two cases of hour-glass contractions occurred in association with chronic ulcer, and were readily diagnosed by X-ray examination. The subjective symptoms resemble those of pyloric stenosis as Boas (52) points out. The incidence of hour-glass contraction in this series is thus 8%. Walton in his "Surgical Dyspepsias" already quoted gives an incidence

of 7.5% and quotes Mayo's figures of 3.3% and Moynihan's of 9%.

Adhesions.

This complication - the result of perigastritis or localised peritonitis, occurred in 12% of gastric, and 10% of duodenal ulcer cases. The condition was discovered in all cases at operation. It proved interesting in several instances as accounting for a change in the character or periodicity of the symptoms.

Pyloric Stenosis.

This occurred in 5 cases or 12% of duodenal ulcers, and in no cases of gastric ulcer.

Ryle (58) has pointed out that with the dilatation of the stomach which ensues in these cases, the hypertonus and hyperperistalsis which formerly contributed to the production of pain are no longer present: there is often thus, an amelioration of the symptoms, as regards pain; but vomiting and the discomfort of retention supervene, where the narrowing is marked.

This occurred in 3 of my patients. In the remaining two a moderate degree of stenosis accompanied apparent healing of the ulcer, and the patients are able to live comfortably with some dietetic restrictions.

Association with Gall-stones.

One case of gastric ulcer was associated with gall-stones. McVicar and Weir (59) at the Mayo Clinic studied the records of 500 successive cases of ulcer and also of gall-stones, and concluded that the incidence was not much greater than that of any comparable group of the general population. One must regard the association in this instance as accidental.

Association with Appendicitis.

This association occurred in two cases of gastric ulcer, and six cases of duodenal ulcer, an incidence of 8% and 20% respectively.

Mayo (60) and Moynihan (61) have pointed out the importance of this association, and have found it present in approximately 80% of cases. The appendix is regarded as acting as a focus of infection.

Multiple Ulcer or association of gastric and duodenal ulcer occurred in 8% of cases. Moynihan (61) gives an incidence of 12.3, Walton (63) of 3.8%, and Mayo (60) of 5%.

The importance of this in modifying symptoms, and treatment - especially operative - is obvious.

Build and Physique.

Reference has already been made to the work of Campbell and Conybeare (8) who were able to show a relationship between hypertonus and hyperacidity on the one hand, and between hypotonus and hypoacidity on the other: and also to correlate these with the physique or build of the individual.

I have therefore noted the physique to ascertain whether there is any relationship in ulcer cases. The physique was found to conform to the following types in:-

Gastric Ulcer.	Orthotonic	16%
	Hypertonic	32%
	Hypotonic	52%
Duodenal Ulcer.	Orthotonic	33%
	Hypertonic	50%
	Hypotonic	17%

According to these figures, therefore, a hypotonic build is more common in gastric than in duodenal ulcer. Ryle (58) considers this partly due to the higher incidence of gastric ulcer in females - and of the above cases 76% were females.

Hypertonus was found present in 50% of patients suffering from duodenal ulcer, and hypotonus in only 17%: so that the hypertonic type of person seems more

prone to develop peptic ulcer in the duodenum, and hypotonic individuals to be relatively unlikely to do so.

Any cases in which doubt arose as to classification were regarded as orthotonic.

Test-Meal.

Further to this investigation an estimation of the free hydrochloric acid, at one hour (by means of the Boas test meal) was carried out in 18 cases of gastric ulcer, and in 22 cases of duodenal ulcer.

The following figures are found:-

Gastric Ulcer.

Free hydrochloric acid: normal	7 cases	or 38.5%
High normal	3 cases	or 16%
Hyperchlorhydria	1 case	or 7%
Hypochlorhydria	7 cases	or 38.5%

Duodenal Ulcer.

Normal	4 cases	or 19%
High normal	10 cases	or 45%
Hyperchlorhydria	6 cases	or 27%
Hypochlorhydria	2 cases	or 9%

I have regarded any figure above 0.2% as hyperchlorhydria, as above 0.146 as high normal, and below 0.036% as hypochlorhydria - those falling between the latter figures are regarded as normal.

This approximates to Bell's standard (64) with fractional test meals. MacLennan (65) regards a

figure above 0.2% as hyperchlorhydria, but gives no definition of hypochlorhydria.

Bell (66) in a series of 27 cases of gastric ulcer found achlorhydria in 14.8%; low normal acidity 18.5%; normal 29.6% high normal 25.9%; hyperchlorhydria: nil.

Moynihan (62) gives the following results in 39 cases achlorhydria 13.1%; hypochlorhydria 15.7%; low normal 18.4%; normal 34.2%; high normal 15.7%; hyperchlorhydria 5.2%.

When we compare these figures with the findings in normal individuals, as in the series of Bennett and Ryle (67), it is evident that, as regards acidity there is no finding markedly characteristic of gastric ulcer.

It was, at one time, considered that gastric ulcer was caused by excess of free hydrochloric acid, the findings in these cases indicate that a normal or low acidity is the more common condition.

In duodenal ulcer, on the other hand, hyperchlorhydria or a high normal acidity occurs in 72% of those examined.

Bell (64) found hyperchlorhydria in 53% of cases; High normal acidity 26.4%; normal or low normal in 20.5%. and no cases of hypochlorhydria or achlorhydria.

Moynihan (62) found hyperchlorhydria 48.5% high normal 24.2% a total of 72.7% of high acidity.

Ryle (38) quotes the combined figures of Bell and Hunter as showing hyperchlorhydria in 70% of cases.

Thus my figures for duodenal ulcer are in close agreement with those of others.

There can be no doubt that in duodenal ulcer cases this characteristic high acidity is of considerable value in diagnosis.

In those suspected to be suffering from gastric ulcer, the test meal seems to me to be of chief value in excluding malignancy, and has indeed proved so in several cases where the X-ray finding was equivocal.

It is noteworthy that in hyperchlorhydria the meal is easily withdrawn through a fine tube owing to the comparative absence of mucus, and is well digested.

X-Ray Findings.

Radioscopic examination was carried out in 22 cases of gastric ulcer and 27 cases of duodenal ulcer.

The following summarises the findings:-

Gastric Ulcer.

Position of Stomach	Normal	8 or 36%
	Low	11 or 50%
	High	3 or 14%
Filling defects.	Niche	3 or 14%
prepyloric defect		13 or 59%
ulcer small curvature (gross defect)		3 or 14%
nil (ulcer at operation		1 or 4%
hour-glass stomach		2 or 9%

The actual emptying rate was unfortunately not noted in a sufficient number for comparison, as most were examined as hospital out-patients, where prolonged observation is difficult. In general the high stomach was rapidly emptying, the low of less active peristalsis.

Duodenal Ulcer.

Position.	High and hypertonic	10 cases or 37%
	Normal with active peristalsis	13 cases or 48%
	Low	4 cases or 15%

Filling defects.

Crater or niche in 4 cases or 15%	
Distortion of duodenal cap	22 cases or 81%
Indefinite (ulcer at operation)	1 case or 3%

Emptying rate. Rapid in 13 cases.
Delayed in 3 cases (pyloric stenosis)

X-Ray examination ranks with a careful history as the most accurate method of diagnosis. Mayo (68) has found Carman's X-Ray diagnosis correct in 95% of patients. The technique of X-ray examination does not come within the scope of this paper.

The niche described by Haudek (70) Carman (69) and others was present in 14% of cases; this was accompanied by the characteristic incisura on the greater curvature during peristalsis.

Prepyloric ulcer occurred in 59% of cases, and in this series, this proved the most common site.

Hour-glass stomach due to ulceration of long duration occurred in 2 cases or 9%.

The presence of hypertonus or of active peristalsis in duodenal ulcer is well recognised, and as Wyard (71) points out is present in nearly every case. In this series 85% showed this feature.

"The deformity of the duodenal cap affords accurate information as to the presence of a duodenal ulcer". (Cochrane-Shanks(72), and Carman (referred to above) places this first amongst radiological signs. It was present in 81.5% of my cases.

Of the 4 cases where the position of the stomach was found to be low, 3 were due to pyloric stenosis with secondary atony.

Carman (73) has stated that he feels that the chief test by which the stomach is to be adjudged of normal tone is its correspondence to the habitus of the individual and not to its form, size, and position alone, and that the tonicity of the abdominal wall must also be considered.

Thus the frequency of the occurrence of duodenal ulcer in hypertonic stomachs, occurring in persons of hypertonic habit, would point to a susceptibility of this type to duodenal ulceration, and the tendency to

develop gastric ulceration would appear to be the reverse, although the predisposing factors are not present with anything like the same frequency. From the figures just given referring to the build of the individual, the free acidity as determined by test meal, and to the position and tone of the stomach found on X-ray examination, it is impossible to deduce any finding correlating these.

In duodenal ulcer, of the 21 cases examined for all three criteria, a correspondence of hypertonic build, hypertonic stomach (X-Ray) and hyperchlorhydria occurred in 10 or 47%. This shows, perhaps, that these conditions are at least strongly predisposing causes, and in the presence of any accidental erosion may tend to prevent or delay its healing.

In gastric ulcer patients, the three conditions of hypertonic habitus, hypotonic stomach and hypochloridria occurred in four cases out of 17 examined, a percentage of only 23. This must be considered inconclusive.

Treatment.

The treatment of patients suffering from gastric or duodenal ulcer is at present the subject of much controversy.

McLean (74) from the medical point of view has warmly advocated intensive alkaline treatment, and has stated that often large penetrating ulcers clear up in a few weeks under this regime.

Moynihan (75) from the surgical standpoint has criticised this treatment, and is a strong advocate of surgery except in cases of short duration.

To the general practitioner the immediate necessity of decision between these extremes does not present itself. Surgical cases (except where such complications as perforation or stenosis are present) are his medical failures; and the unfortunate happening of a recurrence of symptoms of ulceration makes him hesitate to embark on a further trial of medical treatment. His conversion to surgery is a gradual and an individual one in each instance. Each case must be a problem in itself, and the patient's individuality must be considered in respect of the nature of his employment, facilities for dietetic treatment, and his ability - financial, and intellectual to carry it out.

It goes without saying that treatment implies supervision over a considerable period of time. It is well known that the more severe symptoms of ulcer disappear very rapidly under alkaline treatment, and freedom, for a time, from these must not be regarded as cure. The patient is apt to lapse from treatment immediately pain disappears, and to resort to his alkaline mixture on its reappearance, only to present himself again whem complications have ensued. The credit of placing medical treatment on a rational basis belongs largely to Lenhartz (76) and to Sippy (77); Hurst (78, 79) has done much to introduce the Sippy method to this country. I do not propose to enter into medical treatment in detail.

In my cases I have more or less closely followed the routine laid down by Hurst (80) - briefly summarised the diet for the first three weeks, has consisted mainly of citrated milk at two hourly intervals, preceded alternately by tincture of belladonna, and by olive oil, and followed by an alkaline powder. Switched egg is added to some of the milk feeds after the third day, and cereal introduced after 14 days. This treatment would appear to inhibit the motor activity of the stomach, and neutralise excessive acidity. Ryle (81) has shown by means of fractional

test meal curves the fall of hydrochloric acid after belladonna.

Roberts (109) has found that atropin reduces the fasting secretion, and by relaxing the pylorus, facilitates duodenal regurgitation: thus reducing the acidity.

After the third week fish and meat are gradually introduced, but soups, alcohol and condiments are excluded for a period of nine months. Smoking is prohibited. The alkaline powder is continued for six months, and an extra milk feed between meals and in the late evening advised. In anaemic cases iron is administered hypodermically or dialysed iron given by mouth. Supervision is kept up for a year at least, and patients encouraged to return if any symptoms recur.

With a number this treatment proves too irksome and individual variations must be allowed to humour and encourage the patient.

In all cases any source of focal infection was dealt with so far as possible, as advocated by Wilkie (88), Bennett (89), Rowlette (90) and other writers.

Medical Treatment of Gastric Ulcer.

Table II. summarises the result of medical treatment in 23 cases. Two cases in the series (25) are not included as one patient died of haemorrhage in a few hours; and the other was a case of perforation, and had had no previous treatment.

Table II.

Results of Medical Treatment in

Duration and Age Groups. 23 Cases.

Duration.	No. of Cases.	Age.		Result of Treatment					
		Under 40 years.	Over 40 years.	Under 40 years of Age. Cured.	Relieved.	Failed.	Over 40 years of Age. Cured.	Relieved.	Failed.
Under 1 year.	9	9	0	6	2	1	0	0	0
1–5 years.	5	4	1	0	0	4	0	0	1
Over 5 years.	9	0	9	0	0	0	4	2	3

Where the duration of the condition was short - that is in 9 cases, all of whom were under 40 years of age - 66% were cured and 22% relieved. One case or 11% was classified as a failure. This was complicated by chronic appendicitis.

The two patients classified as relieved - both showed a slight recurrence of symptoms after two years - underwent a further period of medical treatment, and have remained well for a period now of over two years. In these eight cases the periods of freedom from symptoms are respectively 4, 4, 3, 6, 2, 5, 2, and 4 years. These periods in view of Smith's (82) experience are too short to be regarded as final.

In the group where the duration was 1 - 5 years medical treatment failed in all instances. In the group over 5 years - all of whom were over 40 years of age - four have remained well for respective periods of 4, 5, 3, 3, years. Two were classified as relieved - one has slight occasional flatulent dyspepsia, and one, a case of hour-glass stomach, remains remarkably free from symptoms on a regulated diet.

Crohn (83) regards hour-glass stomach as "not necessarily a surgical risk, such a deformity", he considers, "is evidence of a spent process leaving a permanent mechanical change".

In three instances medical treatment failed to relieve the condition. There were no deaths in this series.

Tables III. and IV. deal with the results of treatment in cases of gastric and duodenal ulcer complicated by haemorrhage.

Table III.

Haemorrhage in Gastric Ulcer.

Results of Medical Treatment.

Duration.	Number.	Cured.	Died.
Under 1 year.	5	5	0
Over 1 year.	6	5	1

Table IV.

Haemorrhage in Duodenal Ulcer.

Results of Medical Treatment.

Duration.	Number.	Cured or Relieved.	Died.	Subsequently operated on.
Under 1 year.	1	1	0	0
Over 1 year	3	3	0	3

These were treated on the lines laid down in Beaumont and Dodds (84). Summarised this consists in rest, administration of morphine, withholding of food

for 48 hours - injection of calcium, and administration of glucose in saline, per rectum.

The treatment thereafter follows that of ordinary acute ulcer. This treatment proved satisfactory in 12 cases; one patient died. In this instance the haemorrhage was extremely severe, and proved fatal in two hours.

Paterson (85) in advocating medical in preference to surgical treatment states the death rate as 1 in 9 treated medically, and 1 in 3 treated by immediate operation. Miller (86) supports this view, and recommends operation only in cases where the haemorrhage is repeated, or where the ulcer is a chronic one.

Pannett (85) advises operation if the patient's condition permits, as he considers the risk of subsequent haemorrhage an important one. The results in this series certainly support the advocates of medical treatment. The patient whose haemorrhage proved fatal could obviously not have undergone surgical treatment in time to avoid a fatal issue.

Three patients with chronic duodenal ulcer in whom haemorrhage occurred, were all subsequently operated upon. This was undertaken as a measure of safety.

Table V. deals with the result of surgical treatment of gastric ulcer patients.

Table V.

Gastric Ulcer - Surgical Results.

No. of Cases.	Operation.	Result Good.	Result not Good.	Condition after operation.	Remarks.
5	Gastro-enterostomy.	4	1	Biliary vomiting.	Treated by lavage. Ultimate result satisfactory.
2	Gastro-enterostomy + excision of ulcer.	2	-	-	Convalescence rather prolonged, careful dieting required.
1	Gastro-enterostomy to hour-glass stomach.	1	-	-	Prolonged convalesence.
1	Gastro-enterostomy and cholecystectomy	1	-	-	-
1	Gastro-enterostomy + sutures of perforation.	1			-

I am not in a position to discuss the respective merits of the various surgical methods. Of the five cases where gastro-enterostomy was performed, in four the ulcer was prepyloric, and the results good.

One was probably gastrostaxis and in this case bilious vomiting proved troublesome for a period of about a year, necessitating gastric lavage. The ultimate result is good. Where the ulcer was excised in addition to gastro-enterostomy being performed, the site was on the lesser curvature. In these two cases the convalescence was prolonged, and discomfort persisted for at least nine months. The end results are satisfactory. This applies also to the patient with hour-glass stomach.

On the whole the end results of surgical treatment have proved extremely satisfactory. The good results being 90%.

As already indicated the reason that surgery was resorted to in these cases was failure of medical treatment to bring relief.

Table VI. deals with cases of duodenal ulcer treated medically. In eight cases where the duration was under one year, medical treatment gave satisfactory results.

Table VI.

Cases of Duodenal Ulcer.

Results of Medical Treatment.

Duration.	No. of Cases.	Age. Under 40 years.	Age. Over 40 years.	Result of Treatment. Under 40 yrs. of age. Cured.	Re-lieved.	Failed.	Over 40 yrs of age. Cured.	Re-lieved.	Failed.
Under 1 year.	8	6	2	6	-	-	2	-	-
1-5 years.	11	9	2	1	-	8	-	2	-
Over 5 years.	11	5	6	-	-	5	-	1	5

In those of longer duration medical treatment must be regarded as having failed. Some of these failures must be attributed to lack of co-operation on the part of the patient.

Table VII. shows the result of surgical treatment in 18 cases of duodenal ulcer. The results proved satisfactory in 83% of cases.

Table VII.

Duodenal Ulcer - Surgical Results.

No. of Cases.	Operation.	Good Results.	Unsatisfactory Results.
16	Gastro-enterostomy.	13.	3
1	Suture of perforation and insagination.	1	-
1	Suture of perforation and gastro-enterostomy.	1	-

In three cases the results were unsatisfactory. Of these one patient had a return of symptoms, but radiography showed no sign of further ulcer in duodenum or jejunum. In this instance after further medical treatment the outcome was satisfactory. One patient had a haemorrhage four years after operation without other symptoms. The third patient had a recurrence of symptoms but removed from this district, and cannot be traced.

Thus medical treatment of duodenal ulcer proved satisfactory only in cases of short duration, and failed in the more chronic cases.

The results of gastro-enterostomy in chronic duodenal ulcer must be regarded as on the whole satisfactory.

In the gastric ulcer series of the 23 cases under review, 14 have been cured or relieved by medical treatment, a percentage of 60. If divided into age groups of over and under forty years of age, it is found that the percentage is not affected. In the duodenal ulcer series the percentage of good results is 40, the percentage for the two age groups being - under 40 - 35%. over 40 - 50%.

It is necessary to point out, however, that of those classified as cured or relieved all cases under 40 were "cured", while of the 5 cases over 40, two were "cured", and 3 only "relieved".

White (91) has found that healing takes place in 50% of gastric ulcers treated medically, and that the results are better under 45 years of age.

Foreman (92) has found 42% cured or improved, and 57% "in statuo quo ante" or worse.

Lynch (93) in a series of 944 cases treated medically has had successful results in 62.5% of Gastric Ulcer cases, and 79.5% of Duodenal Ulcer cases.

My figures are, therefore, in fairly close agreement with those of these observers.

I have already pointed out the superiority of the results of medical treatment in those of short duration. In my opinion a short duration is the most hopeful prognostic symptom, and age of only secondary importance.

Thus the prevention of chronicity of ulcer, and its complications depends on early diagnosis and efficient treatment. Rowntree (94) has pointed out that, "prevention is better than cure". The medical treatment must however be thorough and prolonged. "The price of cure in peptic ulcer is eternal vigilance". (McClure 95)

In Table I. I have grouped 40 cases as hyperchlorhydria, of these 28 were males and 12 females.

The symptoms were in almost exact accordance with those of duodenal ulcer, as also the sex incidence. These were all considered as possible duodenal ulcers, but were not confirmed by X-ray examination or by the presence of melaena. All responded to modified ulcer treatment, in most cases ambulatory.

These must surely be regarded as either lesser degrees of ulceration, or a pre-ulcerous condition. The history of duodenal ulcer has been shown to be one of remission and relapse, and in most cases of ulcer there has been an early history resembling hyperchlorchydria.

I regard all such cases as potential ulcer, and their successful treatment as ulcer prevented.

If all patients seen at this stage were properly "followed up" in treatment, I am convinced that many operations would be avoided.

Surgical treatment of gastric ulcer proved satisfactory in 90% of patients, and of duodenal ulcer in 83%. There were no deaths. These must be regarded as very satisfactory figures.

Moynihan (96) has reported 500 consecutive operations for duodenal ulcer, without any mortality. These must be regarded as exceptional figures. Six of these however subsequently developed jejunal ulcer.

Young (97) in considering the results of gastrojejunostomy for gastric and duodenal ulcer had good results in 83% of patients and 7.8% of deaths.

Broster (98) in a similar summary regarded 80% as cured, 10% improved, and 12% as receiving little or no relief.

Heany (99) had 80% of good results.

The results therefore, of my enquiry are comparable with those quoted.

The reasons for resorting to surgery are principally those given by Bennett (89) viz., (1) mechanical defects, (2) chronicity, (3) lack of co-operation by patient in medical treatment, (4) danger of the development of malignant changes.

In considering operation, the danger of malignant change must be considered in cases of gastric ulcer of long duration. Duodenal ulcer would appear not be to liable to this development. The figures of various observers vary much. Thus McCarty and Brodes (100) found malignant transformation in 70% of ulcers - Moynihan (96) in 9.6%, Burgess (101) in 5-10%, while Heany (99) had no cases of malignancy in 85 cases examined, White (91) only 2%, Dible (102) with 126 cases histologically examined found no cancer. In view of these differences it is difficult to form a true estimate of this danger.

Gastro-jejunal Ulcer.

I have had no cases of gastro-jejunal ulcer following operation in patients under my care, but

three patients operated on elsewhere have come to me for treatment. This is generally admitted to be a serious complication and one difficult to avoid.

Ryle (103) in discussing its prevention, gives as contra-indications to gastro-enterostomy, "a short history, a well marked hypertonus, a high abrupt curve of acidity, and rapid emptying".

I would add lack of supervision after operation. None of the cases here referred to were "followed up". I think that cases with high acidity should receive alkaline treatment after operation for a prolonged period. Most of these are ulcers of the duodenum, and are not excised at operation, and therefore remain to heal. They may presumably also act as sources of infection.

Rowlands (104) states that the general incidence is about 2%; Paterson (105) found it under 1%; Walton (106) 2%. Walton states that it usually comes on in males with high acidity.

Hurst (107) gives the period of onset as any time from a few weeks to ten years, and he and McVicar and Weir (108) refer to the tendency of the pain to radiate to the left side, often to the inguinal region. The latter writers consider left inguinal

radiation of the pain as conclusive evidence of stomal ulcer.

The condition previous to operation of the three patients suffering from gastro-jejunal ulcer is not known. The ages were respectively 31.30 and 42. The first two were women, the third a man. All had originally duodenal ulcer. The onset after operation occurred in one after 3 months, in the second after 4 months, and in the third after four years. Two who were investigated showed hyperchlorhydria. X-ray examination showed irregularity at the stoma in all three, but no actual crater. Two patients complained of pain referred to the left side of the abdomen, the third of epigastric pain. One only had occult blood in the stools.

All three were treated medically, and could not be considered free from symptoms until after approximately eighteen months of continuous dietetic and alkaline treatment.

I am strongly of opinion that the operation of gastro-enterostomy should be regarded as an aid to and not an end of, medical treatment, and that alkaline and dietetic treatment after operation would prevent jejunal ulcer.

I also feel that surgical aid should be called in before chronicity has proceeded too far, and complications allowed to develop.

GASTRIC CARCINOMA.

There are 14 cases under review in this series.

Sex: The sex distribution is equal; seven being males and seven being females.

This is contrary to the usual finding that carcinoma is much commoner in males. Thus Broster (110) finds the respective number of males and females 27 to 9, and Walton (111) 191 to 71, in their respective series. The number in this series is rather small for comparison.

Age: The average age in the series is 58, the youngest being 38 years, and the oldest 78 years of age. The average age bears out the general finding that carcinoma of the stomach is a disease of middle and old age.

Walton (111) points out that three quarters of the cases occur between the ages of 40 and 70, and Broster (110) gives an average age of 53. Gordon (112) wisely points out that although the average age is high, many cases occur outside the usual age period.

Occupation: In no case could the disease be ascribed to occupational causes.

Family History: One patient had a sister who died of carcinoma of the stomach, and the father of another died of the same complaint; a percentage of 14.

Martin (113) found a definite family history in 18%.

Dietetic Habits: No cases of gross irregularity occurred in this series. Two were heavy smokers; none were alcoholics.

Septic Foci: 5 patients suffered from defective teeth with pyorrhoea. One patient had an associated appendix abscess, but this occurred after the carcinoma.

Association with Syphilis: One case was associated with syphilis. This association was probably incidental, as the primary sore occurred only eight months before death from cancer, and the patient was undergoing active anti-syphilitic treatment

Mode of Onset of the Disease and Symptomatology.

The symptoms which brought the majority of these patients to consult me was, what can best be described, as a "vague dyspepsia".

This held good in eleven patients out of fourteen. Of the three others, one complained of pain in the right scapular region, and only admitted dyspepsia on being questioned. One complained of diarrhoea and vomiting, (this was complicated by appendix abscess), and one of general weakness without any very definite dyspepsia, but

with loss of appetite (this instance simulated pernicious anaemia). The duration of the dyspeptic symptoms was in each of these three patients difficult to elicit and vague.

This "vague dyspepsia" then I must regard as the most characteristic early symptom. It was of the flatulent type in all cases, and, as Graham (114) has pointed out, is described as discomfort or distress rather than pain.

This early distress came on soon after food in 10 cases, about 1½ hours after in one case, and in 3 cases had no definite relationship to meals. The onset appears seldom to be so "punctual" and characteristic as that of ulcer cases. The patient who complained of late pain, suffered from a pyloric tumour. Moynihan (115) has described this as the duodenal ulcer type. One patient had so little discomfort that there was almost complete lack of symptoms. He came for a "tonic", as he felt slightly out of sorts. He had a large palpable tumour of the body of the stomach. Turner (116) has reported two similar cases. Streicher (117) has described this as "silent" carcinoma of the stomach. None of the cases in this series appeared from the history to follow gastric ulcer.

Pain:

Pain, as a rule, follows discomfort as the disease

progresses, and becomes very severe in some cases in the late stages. Graham (114) found that pain developed ultimately in 86% of his cases, and was acute in 40%. 13 of my cases ultimately suffered from pain, and in 8 of these it was moderately severe.

It was absent in one case of tumour of the cardia. Here discomfort was followed by dysphagia, and gastrostomy (so often an unsatisfactory operation) insured a painless course to the end.

The remarks already made as to the periodicity, or lack of it, as regards discomfort apply equally to pain. The pain and discomfort are frequently relieved by alkalies in the early stages, and so may lead to a false sense of security.

Appetite: Early loss of appetite was a feature in 13 cases. One man retained his appetite despite a palpable tumour until well on in the course of the disease. All writers comment on this early loss of appetite, which is probably due to loss of anticipatory tonus. This must be regarded as an important symptom, and one calling for full investigation by available methods. Graham (114) found this in 60% of cases. Gordon (112) early in 30%, ultimately in 80%. Vilvandre (118) also lays stress on

the importance of this anorexia.

Bowels: Constipation was a feature in almost every case. Two patients suffered from periodic attacks of diarrhoea.

Vomiting: This again varied with the progress of the disease. It was ultimately present in all my cases, and came on earliest in two cases where the growth involved the cardiac end of the stomach. This symptom was never present sufficiently early to be of diagnostic value in time to save life, and must therefore be regarded as amongst the late symptoms. This vomiting resulted in little or no relief to symptoms, and appeared to have no definite relationship to meals, except in cases with a growth near the cardia, when it followed closely after taking food.

Martin (113) found vomiting in 80% - 90% of all cases, but regards it as a late symptom.

Loss of strength and weight:

This again is ultimately a feature of every case. The important point however is that loss of strength unquestionably precedes loss of weight.

In striving for early diagnosis this must be borne in mind. I shall refer to this point later.

Loss of weight to an obvious extent seems to me to point to an advanced interference with metabolism, and is likely to be found only in cases where the disease is far progressed. Six patients in this series were fairly well nourished when first seen, but complained of weakness. Four of these had palpable tumours.

Blood: In the last seven cases in this series this was performed. Four showed a slight secondary anaemia. Two showed a marked secondary anaemia. (R.B.C. below 2,000,000.) In one, a wrong diagnosis was made of pernicious anaemia. Here I found the colour index more than one (R.B.C. 2,200,000 Hg B. 50%).

In this case anaemia was early and marked, and dyspepsia only slightly complained of. I, unfortunately, considered an achlorhydria in this case as merely confirmatory of the diagnosis of pernicious anaemia. The onset of gastric pain led to fuller investigations, but then the case was inoperable.

Leucocytosis: Of the seven examined, six showed a leucocytosis of from 8 to 12 thousand. One had a normal white count. Martin (In Osler and McCrae)(113) states that a moderate leucocytosis is usually present.

Eusterman (119) found severe anaemia infrequent.

Haematemesis:

Vomiting of recognisable blood occurred in 5 cases or 35%, but was always a late sign. Occult blood in the test meal occurred in 7 cases or 50%. Hurst (120) found blood in the resting juice in 44% of cases. Dunlop (121) in approximately 70%. Broster (110) in 26%.

Typical coffee ground vomit occurred in 4 cases only, and at an advanced stage.

Malaena: Occult or overt blood was found in 11 cases or 78%. Hurst (122) has stated that malaena occurs in 100%. Martin (113) more than 80%. If this can be borne out by repeated examination then it must prove the most helpful sign in diagnosis.

Physical Signs: The presence of tumour must be regarded as evidence of advanced disease, although in seven cases this was found palpable on my first examination. It was a late sign in four other cases. The three exceptions being the two cases of tumour at the cardiac orifice, and one, where the condition was complicated by appendix abscess, and the tumour found at operation. This patient died following operation.

In only one instance was gland enlargement present

at the root of the left sterno-mastoid. This sign of secondary spread is described by most writers.

Pyrexia: Apart from its occurrence as a terminal phenomenon, an evening rise of temperature was a feature of two cases. Gordon (127) has shown that this is not uncommon occurrence in malignant disease. A third case already referred to, was first seen with a febrile illness - appendix abscess. Gordon suggests that this pyrexia indicates perigastritis.

Other features. 5 cases showed terminal jaundice, pointing to involvement of the liver. 8 cases were operated on, and the growth found irremovable. In two cases of tumour at the cardia, dysphagia was a prominent feature.

Boas' Oppler bacilli were found in only 4 cases. Their presence is probably of little diagnostic significance.

While it has been shown that all palpable tumours are not malignant, I have met with no such cases. The course of the disease in every instance proved the condition to be malignant.

TABLE VIII.

Results of gastric analysis in Carcinoma of the Stomach.

No.	Free HCl Resting juice.	Free HCl At one hour.	Total Acidity at one hour.	Lactic acid.	Blood. Resting juice.	Blood. At one hour.	Remarks.
1.	0	0	40	+	+	—	evidence of retention Carcinoma at pylorus.
2.	0	0	30	—	+	—	evidence of retention.
3.	0	0	50	—	+	+	Mucus. Resting juice fairly clear.
4.	0	0	45	+	+	+	Resting juice foul
5.	0	0	35	+	—	—	Mucus in resting juice.
6.	0	0	40	+	+	+	Evidence of retention.
7.	0	0.036	40	—	—	—	Mucus.
8.	0.073	0.036	20	—	—	—	
9.	0	0	50	+	—	—	Evidence of retention
10.	0	0	50	+	—	—	Evidence of retention
11.	0	0	40	+	+	+	Evidence of retention
12.	0	0	45	+	+	+	Evidence of retention

Gastric Analysis: Much has been written in recent years concerning the early diagnosis by means of gastric analysis, and it is now generally accepted that the points of importance are (a) achlorhydria, (b) presence of lactic acid, (c) blood, (d) evidence of stagnation (Dunlop (121). Table V111.

Achlorhydria was present in ten cases out of twelve examined, or approximately 83%. In two cases a very low acidity was present; at one hour in one instance, and in both resting juice and one hour specimen in the other. Hurst (122) found achlorhydria in 80% at one hour. He however found this reduced to 68% on fractional examination. Spriggs (124) found achlorhydria in 13 cases out of 17. I shall refer tothis point later in discussing diagnosis.

Lactic acid: Was present in 8 cases or 66%. Maclean (125), Dunlop (121) and others have regarded this as of paramount importance in diagnosis, and have found it in every case of cancer where achlorhydria was present.

Blood: This has already been referred to.

Evidence of Stagnation or Retention:

Ryle (126) has suggested that close observation of the physical characters of the test meal may be of greater

diagnostic value than chemical studies.

In the majority of my cases of carcinoma the resting juice has had a more or less foul odour, contained small masses of incompletely digested food, and also mucus. In addition, it may be blood stained, or as in two cases have the typical coffee-ground appearance.

The difference from the clean well digested meal which occurs in hyperchlorhydria is very marked.

X-ray Examination: X-ray examination was carried out in twelve cases. Two patients refused this form of examination.

Six of these patients were found to be suffering from carcinoma in the pyloric region of the stomach, four of the body, and two at the cardia. This was evidenced by filling defects, and perversion of peristalsis in these cases, and in 5 of the pyloric cases by obstruction. One pyloric case showed the "gaping" which has been described by Carman (127) Morrison (128) and others. Of four involving the body, three cases appeared to affect the lesser curvature; one, both lesser and greater.

Those at the cardiac end also showed signs of obstruction in this region. One of these was not diagnosed until the third examination by X-rays, two months after being suspected on clinical grounds.

Thus X-rays proved ultimately accurate in all cases, although failing in the earlier stages in one case. This was possibly due to examination being carried out in the erect position. When the cardia is suspected, Morrison (128) has pointed out the importance of making the examination "lying down".

I shall refer presently to instances in which X-ray examination proved inaccurate in another direction - that of indicating the presence of a defect which was not found at operation. This side of the question seems to deserve more attention. Moore (129) has shown that spasm and other conditions may simulate carcinoma in radiological examination.

Discussion: When one reviews the symptoms of these cases, it is at once apparent that there is no typical cancer syndrome; as Moynihan (115) says "In reading the histories, it is difficult to believe that they always relate to patients suffering from the same disease".

Eusterman and Buerman (119) state that they have found the symptoms of gastric carcinoma more diverse than those of any other disease.

Much has been written in recent years concerning the early diagnosis of cancer; and it is an unfortunate fact that successful treatment by excision is impossible except in

very early cases.

Spriggs (130) has pointed out that a considerable time is too often allowed to elapse between the onset of symptoms and an adequate investigation of the stomach. Eusterman (131) reports that in 32% of the inoperable cases at the Mayo Clinic, the symptoms had extended over sixteen months. Most writers refer to hospital patients, but these I think are to a certain extent selected cases, as many of the more acute cases are obviously hopeless from the time of the first consultation, and are not necessarily referred to hospital.

My own experience of gastric carcinoma has (in this series) been uniformly unfortunate. Out of these fourteen cases, twelve have been diagnosed within a month of first presenting themselves, in fact many earlier; yet all have proved inoperable. Seven, in fact, have had a palpable tumour felt at the first examination. This leaves a bare two cases (14%) for possible success in treatment.

It would therefore seem that a great part of the responsibility for the delay in diagnosis rests with the patient, and that the general practitioner is not the sole person concerned in this delay.

This introduces the difficult and rather delicate

problem of public propaganda concerning early symptoms, which problem I do not propose to discuss.

I have found the average duration of life of these patients to be only 6½ months from the time of seeking medical advice, although it is true that in several instances death has been hastened by operation.

Hale White (132) summarised the prognosis thus - "life is rarely prolonged more than eighteen months or at the outside two years after the patient is first led to consult a doctor for the symptoms of this disease. The duration of the greater number of cases is much less than eighteen months, and often is less than a year". My experience then has been that carcinoma of the stomach is a more acute disease than is generally supposed. Graham (114) has found that the patient rarely lives over a year from the onset of symptoms. Cheever (133) has analysed 236 cases, and in only 9.7% was it possible to attempt a radical operation, yet, the average duration of symptoms was less than 6 months.

Rehfuss (134) has stated that experience teaches him more and more to regard gastric carcinoma as an acute lesion. There are thus a considerable number of cases in which the disease must be regarded as hopeless from the first.

There remains, however, a fair percentage in which diagnosis in time for successful operations is possible. It is our problem to discover and select these. The issue is first complicated by the fact that in practice one sees a considerable number of dyspepsias in which carcinoma is suspected but afterwards disproved. Reference has been made to what is probably the earliest common symptom, namely, a vague dyspepsia occurring in middle life. This is, however, equally, if not more common, apart from cancer. Nevertheless it must be regarded as a possible danger signal, as has been so often pointed out, (e.g. Burgess (135), Spriggs (124), Walton (111) et al.

We must then further investigate the condition. It is obvious that while loss of weight and of appetite are strongly supporting evidence their advent should not be awaited.

Achlorhydria has been shown to be present in almost all cases, but is not, however, pathognomonic. Bennett and Ryle (136) have found achlorhydria in 4% of normal people. Bell (137) has reported the absence of hydrochloric acid in chronic gastritis, gastric ulcer, nervous dyspepsia, gall stones, chronic appendicitis, pernicious anaemia, rheumatoid arthritis, and neurasthenia. I have found it absent in cases of tuberculosis, gall stones and chronic appendicitis.

The diseases which may have to be considered are, therefore, numerous, and not always easy of exclusion.

In suspected cases, however, this absence of acid must be considered highly suggestive. Combined with the presence of lactic acid and blood, it is, of course, almost diagnostic, but some writers (e.g. George and Gerber) (138) consider that the diagnosis in this combination may be early, but not the cancer.

On the other hand, Hurst (120), Roberts (139) and others have shown that hydrochloric acid is not always absent, being present in approximately 20% of cases.

In one of my cases of carcinoma of the cardiac end of the stomach in which a gastrostomy was performed, I was readily able to observe the gastric secretion, and at no stage until within a few days of death were the test meal findings typical of carcinoma. This case, well illustrates the difficulty of diagnosis and is one of the two in this series where recognition was delayed.

M.G. age 58. Female. Seen on 6. 6. 26. Gave a history of dyspepsia for three months. The dyspepsia was flatulent in type, and accompnaied by discomfort rather than pain. There was said to be no loss of weight, but some loss of energy. No vomiting. Test meal: free HCl 0.073%. Total acidity 50%, no blood; slight mucus; no

lactic acid. There was no occult blood in the faeces. Wasserman reaction negative. Leucocytes 7,000. Haemoglobin 75%. X-ray examination - negative.

There was some relief from treatment with carminatives. On 20. 7. 26 she complained of some difficulty in swallowing. X-ray was again negative. Oesophagoscopic examination was also negative. (By Mr. R.P.Mathers). There was little change in the symptoms for the next six weeks. On 6. 9. 26 as the difficulty in swallowing persisted, a further examination by means of the oesophagoscope was carried out by Mr.R.P.Mathers. Some obstruction seemed present at the extreme lower end of the gullet, and a piece of tissue was removed for examination. Microscopic examination showed the appearance of granulation tissue, but no evidency of malignancy.

X-ray examination on 15. 9. 26, now showed some delay at the lower end of the oesophagus, and also some irregularity at the cardiac end of the stomach.

Laparotomy was carried out on 8. 10. 26. There was a tumour mass felt at the cardiac end of the stomach involving the lower end of the oesophagus. Two tumours about the size of walnuts were present, one on the smaller curvature, and

one on the anterior wall of the stomach.

Gastrostomy was performed. The morning resting juice, and a one hour specimen were now examined weekly until death on 12. 1. 27.

There was throughout almost no variation from the original test meal finding for the entire period. Free HCl remained steadily at 0.073% to 0.036%, and total acidity at 50-60. Blood and lactic acid were absent. Ten days before death the resting juice for the first time showed obvious debris, and blood was present. At one hour there was achlorhydria, and lactic acid; mucus and blood were present.

The test meal was now typical of carcinoma. In this case, therefore, the test meal findings were by no means typical of cancer until the terminal stage. One fact must, however, be noted. The stomach was washed out every evening as a routine until 10 days before death. Now it has been pointed out (Bennett) (140) that after lavage of the stomach there may be a return of free hydrochloric acid. This is presumably due to the improvement of the accompanying gastritis, with its associated mucus.

Perhaps this fact accounts for the continued presence of acid, and absence of other signs of cancer. In this case there was no pyloric obstruction to cause retention. I have no experience of the effect of lavage in other cancer cases.

The finding of a high free acidity is reassuring where the symptoms and X-ray examination may be suggestive of malignancy, as in some cases of pyloric ulcer. Husterman and Bueerman (119) consider that if the acidity is adequate the condition is benign.

X-ray examination is now generally credited with being the most accurate method of determining the presence of early cancer of the stomach. (Moynihan (115) Broster (110)). Carman (141) was accurate in 95% of his examinations at the Mayo Clinic, a percentage, he says, "not approached by any other method of examination".

The use of this method of observing the healing of ulcers, and thus excluding malignant change, would appear, from the findings of Jordon (142) to be of the utmost value. This writer includes the disappearance of malaena, and the improvement of symptoms, as other necessary evidences of healing.

I have already stated that radiology may suggest disease which is not found present at operation, and thus fail in an opposite direction.

As has been indicated, one sees in practice a considerable number of dyspepsias in which carcinoma seems

a possible diagnosis.

The following three instances illustrate how closely it may be simulated, and the difficulty which may be present itself in deciding how to deal with them.

In all a diagnosis of gastric cancer seemed probable if not proven; and in all operation proved this to be wrong.

Case 1.

P. J. Male; age 62: Clerk.

Complaint - flatulent dyspepsia for 4 months. Previously well. Loss of energy and weight. Marked loss of appetite.

Appearance - anaemic and spare.

Test meal: Free HCl; absent; total acidity 50; lactic acid and blood absent - some mucus, no malaena.

X-ray examination: Stomach atonic, delayed emptying; irregularity and narrowing of the pylorus. Radiologists opinion - tumour causing partial obstruction at pylorus.

Operation: finding. Stomach rather dilated; no stenosis or defect at pylorus.

Case 2.

J. W. Female: age 62: housewife.

Complaint - flatulent dyspepsia, accompanied by pain in

the left hypochondrium - aggravated by food - not relieved by alkalies; occasional vomiting. Duration 3 months, during which loss of weight about 14 pounds.

Test meal: Free HCl; absent; total acidity 40 - no lactic acid or blood. Considerable mucus, no malaena.

X-ray examination: Gross irregularity at fundus; peristalsis irregular; no delay in emptying, colon normal. Radiologists opinion - tumour of body of stomach involving greater curvature.

Operation: Stomach normal. Colon adherent to parietal peritoneum in region of splenic flexure. Adhesions released.

Case 7.

W. J. Male: age 38: Clerk.

History - dyspepsia for 4 months; late pain suggestive of duodenal ulcer, but irregular in time of onset. No vomiting, history of dyspepsia four years previously. Lost 1½ stones in weight recently. Appetite poor, loss of strength and energy, evening rise of temperature to 99-100°F. Visible peristalsis of stomach.

Test meal: Free HCl absent. Total acidity 40. No lactic acid or blood. Faint trace of occult blood in stools.

X-ray examination: irregularity at pylorus; delayed emptying. Radiologists opinion - pyloric ulcer; ? tumour.

Operation findings: Tuberculous peritonitis in upper abdomen apparently subacute. Adhesions in region of duodenum and upper jejunum.

These cases had, apart from the radiological examination, insufficient evidence on which to base a diagnosis, and in all of them this examination was the determinatory point in indicating laparotomy.

If there is a reasonable doubt, laparotomy must be resorted to, and remains the only sure method of diagnosis except in advanced cases.

Despite the unfortunate happening of an apparently unjustified operation, I am still of opinion that, where there is a strong possibility of the existence of carcinoma, exploration should be advised.

It is interesting to observe that the teaching regarding the diagnosis of cancer of the stomach has taken a new outlook in recent years. The diagnosis no longer waits on tumour, vomiting, haematemesis and wasting, but is suspected from the onset of mild dyspepsia, and loss of energy - with the hope of diagnosis from X-ray and test meal examin-

ations and the presence of malaena. Hurst (143) has given a further new outlook as reported in the Proceedings of the Association of Physicians. In discussing the precursors of carcinoma of the stomach he points out that 20% of cases of this disease are secondary to chronic gastric ulcer, and that most of the remaining 80% are secondary to chronic gastritis. He suggests that achlochydria is precancerous, and due to the chronic gastritis; and that as, in this condition, free acid returns after lavage with hydrogen peroxide, and other treatment, we may hope to provide a real prophylaxis of carcinoma ventriculi from this cause.

The early recognition and treatment of gastric ulcer should eliminate malignancy arising from this cause. Stewart (144) in a series of post mortem examinations found 11.5% of cancer in simple chronic ulcer, but no case of carcinoma arising in healed ulcer scars.

It is now proposed to summarise the remaining conditions which comprise Table 1 and to comment on any points bearing on diagnosis.

Gall Bladder Disease.

Twelve cases are included in the series in which the gall bladder was found to be affected.

Of these, nine suffered from gall-stones, and three from cholecystitis alone. Eight patients suffering from gall-stones were operated upon, and the diagnosis verified in this way; the ninth patient passed a single round stone confirming the diagnosis. The three cases of cholecystitis were also treated surgically by the removal of the gall-bladder. Of the patients who had calculi - six suffered definitely from attacks of biliary colic and during attacks had definite tenderness localised over the gall bladder. In only one case was jaundice present; here the stone was impacted in the common bile duct.

Dyspepsia of a flatulent type was the predominant feature of the remaining three cases. In all, however, there were periods of remission, and of relapse, thus to a certain extent simulating peptic ulcer. During the period of exacerbation, however, in all three there was distinct and definite local tenderness below the right costal margin. This sign is absent during the remission period. Bennett (145) finds that this sign is the most constantly present, and of the greatest diagnostic value.

This evidence was also present in all three cases of cholecystitis. One of these was acute and readily diagnosed. Two were chronic or subacute. These were verified by cholecystography. (dye. concentration test) (Graham)(146).

This method of examination was not available in my earlier cases, but appears to be of the greatest value in diagnosing doubtful cases of gall bladder disease (A.B. McLean)(147) Brailsford (148).

Hurst (149) has demonstrated that gall stones are found in 10% of post mortem examinations of persons over 40 years of age; Cade (150) that symptoms of cholecystitis precede those of cholelithiasis. Gall bladder disease must be a very common condition, and its diagnosis frequently overlooked. It seems likely that its recognition at an earlier stage may now be looked for, with the aid of cholecystography. There seems to be general agreement that dyspepsia when present is of the flatulent type, with no other special characteristic, and that a prolonged history of dyspepsia may precede symptoms which point more definitely to gall-stones. Hunt (151), Moynihan (152), Rowlands (153).

Wilkie (154) has shown these conditions to be due to streptococcal invasion of the wall of the gall-bladder, and has shown the importance played by the gall bladder as a focus of infection giving rise to disease elsewhere. Two of my patients had such conditions which cleared up after excision of the gall bladder. One of them suffered from rheumatoid arthritis, and one from trigeminal neuralgia.

One patient had a recurrence of calculi; several small stones having been removed eight years previous to his second operation. (Cholecystectomy).

Two patients died following operation. In three cases a test meal was performed, all showed a low normal acidity.

Chronic Appendicitis.

Of the 19 cases of this disease five occurred in males and 14 in females. The average age was 34 years - males 42, females 26. This disparity of age as regards sex was due to the fact that two of the five males were over 60 years of age. Only two - approximately 10% - of these patients gave a history of a previous acute attack; but all the remaining patients complained of recurring attacks of abdominal pain localised to the right lower abdomen.

These attacks varied from discomfort, distension and gurgling to more definite pain even causing difficulty in walking. Thus some appeared to suffer more from obstructive symptoms in the region of the caecum; others to a recurring inflammatory condition of the appendix.

Pyrexia. In no case was there a marked pyrexia during an exacerbation. Two cases showed a temperature of 99.8°F. subsiding in 24 hours.

All cases had definite localised tenderness in the right iliac region. This was not present on every examination. I have found it important to ask patients suspected to be suffering from chronic appendicitis to report at once if they experience an increase of pain or discomfort, the local cause of the pain is then readily apparent.

One is struck by the fact that rigidity of the rectus is not frequent, but that on deep palpation with the fingers a point of tenderness is reached, and quite often the appendix can be rolled under the fingers.

All writers on this subject draw attention to local tenderness as being the important point in diagnosis. Fletcher (156), Trotter (157), Dowden (158), Walton (159) Fellows (160).

I have not met with any cases in which dyspepsia, resembling ulcer, was a feature. Three patients had associated flatulent dyspepsia, but in all, the predominent symptoms and discomfort were referred to the iliac region.

Associated mobility or prolapse of the ascending colon.

Five patients were found at operation to have an undue mobility of the caecum or of the ascending colon. These were

treated by fixation of the colon, in addition to appendicectomy.

Some writers e.g. Hathaway (161) object to the term chronic appendicitis and prefer subacute. Hathaway points out that affections of the caecum and ascending colon give a distinct clinical picture. Carslaw (162) has had satisfactory results from colopexy in this type of case.

More experience inclines one to differentiate two types of sufferers from right iliac pain - the recurring inflammatory type (as described e.g. by Stengal in Osler and McCrae (163)), and the type just discussed.

The special features of this type appear to be localised discomfort, associated with distension of the caecum, and often attended by gurgling. Tenderness is always present. General and toxic symptoms are more marked e.g. nervousness and depression, sallow skin, furred tongue, weakness and often faintness and constipation. Flatulent dyspepsia, probably reflex, accompanied all my cases.

These patients present many of the features of enteroptosis. The operation results were in every case satisfactory. In two elderly men (62 and 66 years) the symptoms were largely due to partial obstruction from adhesions, obviously pointing to previous inflammatory attacks.

Radiology.

Seven cases were examined by X-rays. Two showed definite kinking of the appendix. Two showed imperfect filling. The remaining three gave indefinite pictures, but in all seven there was present definite tenderness over the appendix when palpated during examination.

Test meal.

Four cases, all of the second type (mobile colon) were given a test meal (Boas). In all the figures for free hydrochloric acid were low normal.

Acute Appendicitis.

Twenty-two cases of acute appendicitis occurred; 12 being males and 10 females.

These were all typical cases, and do not call for discussion. Three patients had suffered from previous attacks. All were successfully operated upon.

Enteroptosis.

In this group of 13 patients, 12 were female, one a male. In his series of 400 cases, Walton (164) found the ratio approximately 3 females to one male. These female patients fall roughly into two groups.

(1) Young, usually unmarried females (with probable congenital defect.

(2) Older women, with lax abdominal walls.

Saner (165) classifies these as congenital and acquired.

The male patient (age 29) was of the same type as group 1.

Group 1.

The condition in this group is "probably not a disease at all but a congenital deformity, due to these persons being born with abnormally long mesenteries". (Wyard (166)).

The build of such patients, I have found to fit in with the general description - long thorax, sloping shoulders, narrow intercostal margin, and lax abdominal wall, (e.g. McLennan (167)). These patients are apt to present a complex symptomatology. Bedingfield (168), has recently described the condition with great detail. He states the four cardinal symptoms as, general weakness, abdominal discomfort, constipation, and flatulence; while neurasthenia (usually an anxiety neurosis) vasomotor disturbances, menstrual pain or irregularities are common features. Hurry and Fenwick (169) have pointed out how this condition is rendered chronic by the kinking of intestines, leading to faecal stasis, with further aggravation of the kinking; and the toxic condition resulting leads to loss of adipose tissue which again aggravates the ptosis.

The condition may give rise to considerable difficulty in differential diagnosis, as the symptoms may closely resemble those of localised organic disease - especially gastric ulcer. It is well to remember that ulcer may co-exist - one of my

cases of gastric ulcer occurred in a patient with well marked enterptosis.

The lack of periodicity of the symptoms and of benefit from alkalies along with negative X-ray examination, and absence of malaena seem to me to be the chief points in differential diagnosis.

Five of my patients had been treated by operation for supposed chronic appendicitis with only temporary benefit. I have found the condition intractable; neurasthenia being probably the most troublesome symptom.

Each new system of treatment - abdominal exercises, massage, abdominal belt, change of diet, rest cure, spa etc., - seem to do good only temporarily.

Trant (170) has reported a measure of success by treatment with small doses of insulin, thus inducing a craving for, and increased assimilation of carbohydrates. He has succeeded in this way, in obtaining a definite increase of weight.

Group 2; requires little comment.

I have found the average age to be 49 years; all had borne several children. The abdominal wall was lax, with protuberance of the lower abdomen. Three had various degrees of uterine prolapse, and two had palpable kidneys. Constipation was a feature of all, as was some degree of anaemia, with sallow skin and poor nourishment.

Dyspepsia was of the flatulent type.

Many cases commonly classified as debility belong to this type, although they may have no abdominal symptoms. In such cases the toxic symptoms predominate.

I have had two patients suffering from Dietl's crisis - one with six attacks; both had in addition a degree of general enteroptosis, and should perhaps be classified as belonging to this group.

Diverticulitis.

This condition was diagnosed in four cases. Two were males and two females. The average age was 54 years - which approximates the finding of Masson (171) in 289 cases at the Mayo Clinic.

Clinical features.

Diverticulitis must be regarded as an inflammatory complication of diverticulosis; (Overton (173)) and as the inflamed area may be limited, it is likely that the two conditions usually co-exist. The condition of diverticulosis would appear to be generally quiescent, although Spriggs (172) finds that about half the subjects complain of symptoms, especially constipation, flatulence and general discomfort. I have not made a diagnosis in any case of this condition. Three of my patients would appear to come within the group described by Mayo (174) as self-limiting diverticulitis and peridiverticulitis.

In all three, the symptoms complained of were pain and discomfort in the left iliac fossa. This was usually accompanied by a slight pyrexia and feeling of malaise. In two there was a mucous discharge pointing to an accompanying colitis. Local tenderness and distension of the colon were present, and in two, a palpable mass in the sigmoid suggest-

ing tumour. Rectal examination was negative. The condition, I have found, subsides in about a week, and there is comparative freedom from symptoms, until another diverticulum becomes affected.

Two of these patients have had three attacks, and one, two attacks. The diagnosis depended in these cases upon an X-ray examination after administration of a Barium enema.

My fourth case was not diagnosed until operation. The symptoms were acute, pain was localised in the left iliac fossa and the outline of the colon was palpable. The temperature was raised to 102°F, the abdomen was distended and vomiting occurred.

I diagnosed the condition as a malignant tumour accompanied by an inflammatory condition causing obstruction. The condition was not clear at operation, and the mass was excised. The excised portion of sigmoid was found to be affected by diverticulitis, with a superimposed inflammatory condition. The patient recovered.

De Quervain (175) has described a condition which he calls "chronic stenosing diverticulum tumour", which seems to have been the condition in this instance.

According to Mayo (174) the immediate obstruction is

due to inflammation and oedema in the affected part. Cases where the symptoms are so acute as to resemble left sided appendicitis are described by Barling (176) and others.

The causation of diverticulitis is not clear; all these patients had suffered from constipation for a long period, so that their condition was probably due to the formation of "pulsion" diverticula, as described by Telling (192)

Acute dilatation of the stomach.

Four cases of this alarming condition occurred. There was in every case well-marked dilatation of the stomach, so obvious as to be visible. Vomiting was copious and bile stained, and epigastric pain and tenderness present to a considerable degree.

The outstanding feature was, however, the general collapse and distress of the patient. The pulse in all cases was rapid and small; pallor was marked, and a cold clammy perspiration was present. The condition is generally believed to be due to an obstruction of the third part of the duodenum by the superior mesenteric vessels.

In two of my patients the condition followed confinement and the general condition suggested internal haemorrhage. The greatly dilated stomach was, however, very obvious. Both were treated by being placed in the prone position and by raising the foot of the bed. A stomach tube was kept in for some hours and repeated lavage given. Pituitrin was administered.

Both cases were the cause of great anxiety for 8 - 12 hours. Both patients had a general anaesthetic. In the series of 144 cases collected by Borchgrevink (177) all but one had general anaesthetics.

Of the other two, one, a man of 38 years suffered from the condition following excessive beer drinking. A similar case is reported by Kirch (178).

The other patient, a girl aged 11 years, stole and ate one pound of chocolates, four cream cakes, and two small cream cheeses; these were consumed with great rapidity. Farquhar (179) reports a case where a girl ate one pound of dried figs. These two cases were treated as above and recovered.

Syphilis.

I have included five cases under this heading. In these patients various gastric conditions were present, accompanied by a positive Wassermann reaction.
"The presence of a positive Wassermann reaction in individuals, with gastric symptoms may be either purely incidental or evidence of the real cause of the patient's complaints". (Gray) (180).

Three of these patients had symptoms typical of duodenal ulcer; and of the three, X-ray examination showed evidence of distorted duodenal cap in two.

Test meals showed free hydrochloric acid within normal limits. All were known by me to have a syphilitic history, and were treated by antisyphilitic remedies only, with complete recovery. Ulcer, of course, may coincide with syphilis. Engel Prager (181) found 10% of all ulcers to be syphilitic.

A fourth patient had indefinite gastric symptoms, (flatulent dyspepsia etc.) with attacks of pain suggestive of gall-stones. As she had a history of having had several miscarriages, a Wassermann test was taken and found positive. The condition cleared up with appropriate treatment.

The fifth case also had a gastric condition with indefinite dyspepsia, but accompanied by vomiting. She had,

however, in addition a nasal discharge, and a perforation of the septum.

A blood test found positive, and antisyphilitic treatment, resulted in amelioration of the condition. Further evidence would be required to prove definitely that these were true syphilitic lesions. McNee (182) has shown the presence of spirochaetes in the stomach and cases (e.g. Smith (183)) of gastric syphilis have been reported. The response to treatment must be regarded as suggestive.

Diet dificiencies (vitamins).

This group I have included as all came to me suffering from abdominal symptoms. Their condition seemed to me to be due to a definite deficiency of suitable food.

The 56 cases, included 30 males and 26 females, and fell in the age period of 16 - 23 years. All belonged to the working classes - generally the lower grade labouring classes. In almost every instance the mother also worked, so that freshly cooked food was not generally provided. A typical mid-day meal might consist of tinned meat (no potatoes) or pie - followed by tea with condensed milk, bread and margarine, and pastries; a diet very low in vitamin content.

That the digestive system suffers from vitamin deficiency has been frequently pointed out - Cramer (184-5)

has produced experimental evidence to show that vitamin A has a specific stimulating effect on intestinal mucous membrane which atrophies in its absence; while vitamin B has a stimulating effect on lymphoid tissue, and on the process of digestion and absorption.

Cowgill (186) has found that in the absence of vitamin B, there is a decreased desire for food and inability to use it. Findlay (187) has also found this in his investigations. McCarrison (188) considers that vitamines activate the cells of the digestive system. McCollum (189) has pointed out the loss of appetite where vitamin B is deficient in food. Rowlands and Browning (190) found atony of the stomach to result in rats due to deficiency in vitamin B.

This group, of course, does not properly belong to diseases of the digestive system, but is part of a larger group of cases of which malnutrition was a feature but as I have said, it was the abdominal condition of which they first complained.

The cheif complaint was loss of appetite, fullness of the stomach with discomfort and often flatulence, and constipation. In some cases there seemed to be perverted appetite with carbohydrate craving.

The treatment consisted simply in improving the diet as regards "freshness" - introducing eggs, fresh butter,

vegetables, and a daily pint of milk.

The nutritional effect, (which does not come within the scope of this paper), is rapid, while the improvement in digestion is marked.

It is difficult to prove that this is entirely due to increase of vitamines, as the previous dietary is also deficient generally in proteins and fat,and overloaded with carbohydrates; nevertheless the probability is that, as the symptoms correspond to those experimentally produced in animals by vitamin deprivation, the cause is similar.

Intestinal Obstruction: (10 cases).

Seven of these cases were due to tumour, and three to other causes.

Of the cases due to tumour the obstruction was first seen when acute in three cases. In the other four, the condition gave rise to symptoms before obstruction of a complete nature took place.

The sites of the obstruction in the acute conditions were respectively (1) the jejunum, (2) the caecum, (3) the sigmoid flexure (colon).

Case 1. J.R. Female, age 29, gave a history of two previous attacks of acute abdominal pain which passed off in about two hours. When seen there was obvious intestinal obstruction with visible peristalsis, and typical colicky pain. This passed off in about 3 hours. I insisted on operation. A small adenoma about 2 inches in diameter was found growing from the jejunal wall and projecting on the peritonal aspect. This had caused obstruction by a simple twist.

Case 11. J.F. Male, age 46, had been treated for duodenal ulcer for 10 years and was seen on account of more

violent pain and vomiting.

Tenderness was present in the right iliac region, and a palpable mass was felt locally and per rectum. Diagnosis was obvious. The mass, on resection, proved to be due to an epithelioma of the ileo-caecal valve. The wall of the colon for several inches was the seat of several small adenomata. A good recovery was made.

Case 111. J.W. Male, age 62, seen with typical intestinal obstruction of the large intestine. This proved to be due to a carcinoma of the sigmoid flexure. This was successfully resected, three weeks after a preliminary caecostomy.

Of the four more chronic cases, one was due to an adenoma of the rectum. The symptoms were those of partial obstruction, colic and abdominal distension. A mass was palpable per rectum, thought to be malignant, but proved simple.

The remaining three patients all suffered from cancer of the colon, (two ascending: one descending).

The symptoms in all were similar to those described by Hurst, Turner and Venables, (193) and by McAuley, (194), namely abdominal discomfort; pain localised in the segment of the bowel proximal to the obstruction, and also a change

in the habitual action of the bowel. This last symptom took the form of constipation, with occasional attacks of diarrhoea.

Occult blood was found in the faeces of two patients. Rowlands (195), and others have indicated the importance of this. The growth was resected in two cases and found to be inoperable in one.

The obstruction was confirmed by X-ray examination in all three cases.

The symptoms of this condition seem to me so characteristic, and the diagnosis can be so readily verified by radiological examination (combined barium meal and enema) that it should not be overlooked.

The association of adenoma with neighbouring carcinoma would appear to be relatively frequent. Stewart (196), Burgess (197).

The other conditions which were found causing intestinal obstruction were, (1) femoral hernia, (2) volvulus (small intestine), (3) adhesions following former peritonitis - probably tuberculous. The obstruction in these was acute.

Acute Gastritis (95 cases)

This formed by far the largest group in the series: and has been the least investigated by me, really on account of its ready and immediate response to treatment.

Fifty-one cases were male and forty-four female. In twenty-five, intestinal symptoms were also present. Thirteen of these occurred in an epidemic of food poisoning due to Gaertner's bacillus. In all of the food-poisoning patients, the symptoms were very acute; vomiting, diarrhoea, pyrexia and collapse being evident. In two instances intestinal haemorrhage occurred. Seven males and four females suffered from acute alcoholic gastritis.

The cause in the remainder appeared to be indiscretions in diet. In some (9) decomposed food was the most likely cause.

Vomiting occurred in 29 cases, approximately 30%.

No gastric contents were examined. All responded readily to simple treatment, starvation, initial purge, and astringents.

Chronic Gastritis. (27 cases)

I have included in this group 27 cases of whom 20 were males and seven females.

The apparent causes of this condition were rather varied. Improper mastication was the most common cause, and I attribute this to 15 cases.

Imperfect dentition was present in 11 of these patients, and in eight of the eleven, the gums were also the seat of sepsis (gingivitis or pyorrhoea). There was thus a probable double predisposing cause in these patients.

In four, the condition was probably caused by hurried and irregular meals.

Five cases I attribute to chronic alcoholism - of the "soaking type".

Swallowing of infective material appeared to be the cause of the condition in four patients. Three had chronic tonsillitis, and one nasal polypi with associated sepsis. In the case of three female patients the cause of the condition was difficult to assign. One suffered also from chronic bronchitis, and two ate frequently between meals. Tea and soup, they both liked "nice and hot".

Such causes as the above are those commonly given by writers on the subject. Conybeare (198), Marcus (199), Rehfuss (200).

The symptoms are more or less similar in most cases, but not pathognomonic. Pain is usually slight and rather aggravated than relieved by food. Alkalies have little effect on the symptoms, carminatives giving more relief. The appetite is frequently bad in the morning, and often heavy meals are taken later. Morning retching or vomiting are especially characteristic of alcoholic cases. Ryle (201).

The general condition and nourishment are often good, I have noticed when examining the throat or passing a stomach tube that the pharynx of these patients is often unduly sensitive.

Test meals were examined in 8 cases - with the following findings - Achlorhydria 1: Hypochlorhydria 5: and normal acidity 2 cases. Bell (202) in eleven cases found achlorhydria 5; ~~and~~ hypochlorhydria 3: and hyperchlorhydria 3.

All meals showed an excess of mucus: in some, this was quite tenaceous. No occult blood was present. Ryle (201) states that normal acid curves may return after lavage. I did not examine for this in any case in the present series.

This condition , so closely resembling cancer in its symptomatology and test meal findings, has been to me on a number of occasions a source of some anxiety. The X-ray

findings are most helpful here, being largely negative.

Absence of occult blood in test meal and faeces is of great value as a differential sign, as I think is also a blood examination.

Observations of the weight should also be kept.

Improvement follows the use of a more rational dietary, and attention to oral sepsis.

Gastric lavage I carried out in only 3 cases. It caused a marked and rapid improvement of symptoms.

A more serious view must now be taken of chronic gastritis, having regard to Hurst's opinion (already mentioned, (143) that it is the precursor of carcinoma ventriculi.

Successful treatment must include a return of free Hydrochloric acid to the gastric contents; and a close follow up of all patients is clearly indicated.

Of the 27 cases of this condition, I am still in touch with 21. None of these show any symptom suggestiveof the development of cancer.

The period since diagnosis is however comparatively a short one - varying from 3-6 years only.

Nervous Dyspepsia (20 cases)

Males 4: Females 16:

To a certain extent patients are apt to be assigned to this group, when no other diagnosis of a more definite kind can be made: and when nervous symptoms of a general kind are also present. A full investigation should always be made to exclude other diseases.

One feels quite prepared in a number of these cases to revise the diagnosis.

Air-swallowers: one male and four females have been definitely addicted to this habit.

In two the condition could be watched on the fluorescent screen during an X-ray examination.

Persistent slight belching was a feature of one of these patients. The condition is difficult to treat; I have found that a warning never to try to bring up the wind is most helpful (Conybeare (203), as it tends to stop the swallowing of it. The test meal findings were normal in the two patients just mentioned.

Definite hysteria was present (on occasion) in two cases. During and between attacks dyspepsia of a flatulent type was always complained of.

The other patients in this group might almost be said to be sufferers from "anxiety neuroses" in which the stomach was the chief centre of "interest".

Their thoughts seem to be constantly diverted to their digestion, and many varieties of patent food-stuffs are taken in the hope of cure. In almost every case, as Ryle (204) has also found, flatulence is a feature.

Holland (205) states that the "chief difference from organic disease is the irregularity of presentation of the symptoms both as to their relation to meal times, and to the character of the food." He also points out what I consider to be of great help if properly enquired into - namely "the relationship to the emotional mood of the time".

In many such patients the symptoms are only present, or aggravated, coincident with emotional upset, or as Hurst (206) says, are associated with obvious fatigue.

Dyspepsias of the Menopause (18)

Dyspepsia at the climateric must be regarded, I think, chiefly as of nervous origin. The condition is accompanied by vaso-meter disturbances such as flushing and sweating, and often by more or less severe mental disturbances.

The age incidence naturally gives rise to fear of carcinoma, and cases may have to be fully investigated on this

account.

Dysentery (3 cases)

These were all cases of amoebic dysentery, home on leave from India. The finding of the Entamoeba histolytica and response to treatment by emetine completed the diagnosis.

Worms:- (4 cases)

Two patients suffered from tape worm (Taenia Saginata), one from round worm (ascaris) and one from thread worms (oxyuris). Both sufferers from tape worm suffered from dyspepsia, accompanied by some colic; the patient with ascaris complained chiefly of nausea. Tape worm appeared in the stools of the two affected by it. The round worm was vomited.

An adult male, age 48, complained of tenesmus and mucous discharge from the bowel. Thread worms were seen in large numbers on rectal examination.

Stevens (207) describes dyspeptic conditions and proctitis, as occuring in these respective conditions.

Jaundice (8cases)

These patients all suffered from catarrhal jaundice, as evidenced by onset, duration and course.
(This group does not include jaundice as a symptom of gall-stone obstruction, or as a terminal event in cancer of the stomach involving liver).

The onset in all patients in this group, resembled that of an apparently mild acute gastritis: three had vomiting and two diarrhoea. Four were seen on account of these symptoms before icterus became a feature. Five had pyrexia lasting from one to four days.

Cirrhosis of the Liver (2 cases)

Both cases suffered from multilobular cirrhosis (alcoholic). Both were first seen when the disease was fairly obvious and ascites was present: and as the liver could be palpated and the Wassermann reactions were negative, there was no difficulty in diagnosis. Both were alcoholics.

Lienteric diarrhoea: (Gastrogenous diarrhoea) (3 cases).

Three patients suffered from this complaint.
In all the movement of the bowels occurred within half-an-hour of taking food. The motions were fluid, sour-smelling and undigested. The general health seemed to be little affected

and the motions were not accompanied by pain.

A test meal was examined in two cases, and in both there was complete achlorhydria.

Marcus (208) attributes the diarrhoea to the fact that (1) the food is not properly prepared in the stomach for intestinal digestion, (2) organisms which should be destroyed by acid in the stomach gain access to the intestine. Stengel (209) suggests that, lack of digestion due to insufficient pancreatic stimulation, (from absence of acid) plays a part. These patients all improved on taking dilute hydrochloric acid with their meals. Rehfuss (210) found also that this type of diarrhoea was relieved by the administration of acids.

Carcinoma of the oesophagus (5 Cases)

In all of these patients the obstruction in the oesophagus was in the upper or middle third.

In two patients there were some symptoms of oesophageal obstruction, the condition was due to carcinoma at the cardiac end of the stomach. This has already been discussed. The complaint in every case was of difficulty in swallowing, first dry solids, later liquids.

The diagnosis depended in all cases upon X-ray examination; showing the fact and the site of the obstruction.

In three cases this was confirmed by removal and examination of a piece of tissue through the Jackson's oesophagoscope.

The remaining conditions were due to, or associated with, diseases not primarily arising in the gastro-intestinal tract. The diagnosis has therefore depended on methods of examination appropriate to the system affected.

Pernicious anaemia (3 Cases)

These cases, three in number, all first complained of dyspepsia of a flatulent type, accompanied by loss of appetite. Lintz (211) found the incidence of gastro-intestinal symptoms in pernicious anaemia to be over 50%.

All had complete achlorhydria: this is a feature of the disease and is present in almost all cases .(Hurst (212)).

The diagnosis depended on the examination of the blood. This condition is apt to give rise to a suspicion of carcinoma of the stomach, but the colour index, halometric reading, etc. of the blood should make the diagnosis plain.

Brain Tumour: (2 Cases)

In two cases of this condition, gastric symptoms were present before actual vomiting became a feature.

Nausea and flatulence were both complained of and may have been incidental. Headache was present throughout. The symptoms were sufficiently indefinite to lead to X-ray examination of the stomach. The onset of optic neuritis and localising symptoms led to a diagnosis later.

Migraine (3 Cases)

The retching and vomiting which occurred in these cases were accompanied by the classical signs of headache (hemicrania) and visual disturbances.

The history or repeated attacks with an added family history (in two cases) made the diagnosis comparatively easy.

Angina Pectoris: (8 Cases) (Six males, two females).

The association of dyspeptic symptoms with true angina is well-recognised, (Cowan and Ritchie(214) McKenzie (215)). Reid (216), Wearn(213), in a review of 40 cases, found that 30 of these "gave stories of trouble referred to the gastro-intestinal tract". The reason of this association in the patient's mind appears to be due to the fact that an over-loaded or distended stomach may precipitate an anginal attack; and that often pain seems to be relieved by eructation of wind.

In all cases of angina here referred to, the disease ran a chronic course. All ultimately died in anginal attacks or of cardiac failure.

The recognition of the condition is comparatively easy when several attacks have occurred; but when the attacks are mild, and the pain complained of is referred to the lower sternum, the diagnosis may be very uncertain.

The diagnosis depended in all these patients principally on the history. On cross examination the radiation of the pain may be brought out; or the fact that exertion or emotion also play a part in the onset of the attacks. Most patients find that when pain is present they must stop walking, or, if sitting, must sit rigidly. In one patient, the attacks were very frequent and regular, and came on about two hours after food. They were also relieved to some extent by alkalies, but not prevented. I diagnosed this case as "duodenal ulcer", supported by the fact that X-ray examination showed an irregular duodenal cap. He, however, took a severe anginal attack when under treatment, and ultimately died during a seizure.

Examination of the heart and blood vessels may reveal circulatory disease - high blood pressure, dilated aorta, etc., but I found clinical examination in this series largely negative.

These eight patients comprised roughly a third of the anginal cases occurring in my practice in the same period.

Pyelitis (3 Cases) Renal calculus (2 Cases)

Renal calculus is included with pyelitis, as in the two patients here referred to, Colic was not a prominent feature, and there was associated pyelitis.

The symptom complained of was principally abdominal pain. All were females. One patient suffered from acute right sided abdominal pain with rigidity, which I diagnosed as appendicitis. The true condition was recognised in hospital.

Cope (217) has found this a frequent mistake in diagnosis. He points out the necessity of urine examination, and the importance of the history of an initial rigor. In the remaining two cases of pyelitis, the kidney was palpable, and bacilli and pus cells were present in the urine.

In one case of renal calculus, the condition was essentially similar, but X-ray showed an irregular shadow in the kidney.

In none of these patients were urinary symptoms primarily complained of, but were brought out on questioning.

Uraemia: (chronic) (8 Cases)

This condition is responsible for dyspepsia of a flatu-

lent type, which is probably due to associated chronic gastritis.

This group should possibly therefore be included with chronic gastritis in that group.

The chronic interstitial nephritis is, however, the primary and more serious condition.

Browning Alexander (220) states that this condition is responsible for dyspepsia more often than is commonly supposed.

The diagnosis, suspected by the appearance of the patient, is dependent on the urine examination, (faint trace of albumen usually, low specific gravity) and cardio-vascular changes (arterio-sclerosis, hypertrophied left ventricle, raised blood pressure).

In three cases the blood urea was found raised, and in three the urea-concentration test was low.

Acute nephritis (6 Cases)

Vomiting was the outstanding symptom in these cases. Pallor, puffiness of the lower eyelids and headache gave a clue to the diagnosis, which urine examination verified.

Four cases gave a history of recent tonsillitis, in my experience one of the most frequent precursors of acute nephritis.

Influenza: (24 Cases)

These cases all occurred during the influenza epidemics. It seems sufficient to point out that a gastro-intestinal type of influenza is well recognised. None presented features differing materially from acute gastro-enteritis of a severe kind.

Four gave rise to a suspicion of acute appendicitis - Cope (219) has experienced similar cases. Hiccough was a feature in three cases. The condition is not usually confined to the gastro-intestinal system. There are generally some respiratory symptoms, or substernal pain. Associated headache, pain in the eyeballs, and muscle pains are often present.

Diabetes (1 Case)

This patient - a man aged 58 years - complained of flatulent dyspepsia. Glycosuria was discovered in the routine examination.

Tobacco (1 Case)

This was probably a case of acute nicotine poisoning. The condition followed a fourteen hour train journey when 60 cigarettes were smoked. Violent vomiting was the chief feature.

Gynaecological (6 Cases)

Uterine fibroids (3 Cases)

These were all cases of large fibroids causing abdominal symptoms without uterine bleeding. The symptoms complained of were of intestinal flatulence, borborigmi, and on occasion colic.

Ovarian Cyst (1 Case)

This caused symptoms similar to the above. All of these were palpable on examination of the abdomen. Vaginal examination completed the diagnosis.

Lead Poisoning (1 Case)

This patient - a compositor - suffered from flatulence, intestinal colic and constipation. There was an obvious "blue line" on the gums, which, along with anaemia, completed the picture.

Pulmonary Tuberculosis (3 Cases)

Dyspepsia in the advanced stages of this disease is well recognised. One patient - a male of 45 years - complained of loss of appetite with flatulent dyspepsia and nausea. His expectoration he thought came from the stomach. He had well-marked apical tuberculosis.

It has been pointed out, however, by various writers, that dyspepsia may be complained of as an early symptom in tuberculosis and may give rise to difficulty in diagnosis. Alexander (220) Tylecote and Fletcher (221) Norris and Landis (222) Ryle (223). Rehfuss (224) regards this as due to atomy of the stomach, with an increased sensitiveness. Two patients complained of gastric symptoms, whose subsequent history proved them to be sufferers from pulmonary tuberculosis.

The symptoms were anorexia, and a feeling of distension and weight after food; weakness and loss of energy were also complained of. Cough was considered a minor element by both. X-ray examination showed both stomachs to be atonic, and there was delay in emptying. Test meal showed achlorhydria in both cases. Roberts (225) and others have shown that low acidity is a characteristic finding.

A history of evening pyrexia, and of increasing chest symptoms led to X-ray examination of the chest as advocated by Leb (226) in such dyspepsias. He found, in this way, that a considerable number of patients with atonic stomachs, associated with low acidity, were past or present sufferers from tuberculosis.

The finding of tubercle bacilli in the sputum confirmed the diagnosis.

Although this difficulty in differential diagnosis may not often arise, it was only after a full investigation and the lapse of some weeks that the true nature of the complaint was apparent.

Summary and Conclusions.

It has been shown how varied the disease conditions are, which may be found in patients whose symptoms are gastro-intestinal.

The high incidence of dyspepsias due to definite organic causes has been shown, as compared with "functional dyspepsia".

The importance of various symptoms and signs of gastro-intestinal disease has been discussed; and a percentage incidence given in dyspepsias of organic origin.

The importance of clinical methods of investigation of the stomach contents and faeces has been shown. These methods are applicable for use in general practice, and help in the early recognition of disease.

By early recognition, treatment is simplified, operations avoided and chronic ill-health avoided. The symptoms, diagnosis, and results of treatment (medical and surgical) of peptic ulcer have been more fully discussed.

Test meal findings have been given in these conditions, showing that hyperchlorhydria is a frequent characteristic of duodenal ulcer.

No characteristic acidity was found in gastric ulcer cases.

Occult blood in the faeces as a sign of active ulcer, has been shown to be of great value.

The complications of peptic ulcer have been shown, and their diagnosis discussed.

Indefinite findings have resulted in the consideration of the association of the patient's physique with his test-meal findings, and the type of stomach (as evidenced by X-Ray examination).

Medical Treatment of peptic ulcer has proved satisfactory in early cases, and unsatisfactory in later cases.

Surgery should be resorted to before complications have set in.

The satisfactory result of medical treatment of haemorrhage from peptic ulcer has been shown.

It is advocated that careful medical treatment be given after "gastro-enterostomy" to prevent the occurrence of jejunal ulcer and haemorrhage.

The difficulty in diagnosis of gastric carcinoma has been discussed.

"Vague dyspepsia" loss of appetite and loss of strength, have been found the most common early symptoms.

Loss of weight, vomiting, and haematemesis, and the presence of tumour are late symptoms.

Achlorhydria in the gastric contents was found in 83% of cancer cases, and lactic acid in 66%. Occult blood was found in the faeces in 78% of cases.

These three findings (achlorhydria, and the presence of lactic acid, and of occult blood) are characteristic of gastric cancer, but not pathognomonic.

X-Ray examination is probably the most hopeful method of early diagnosis.

Laparatomy is advocated where reasonable doubt as to the presence of carcinoma ventriculi exists - as the most sure method of early recognition, and the only hope in treatment.

It has been shown that carcinoma of the stomach is a more acute disease than is generally supposed.

The efficient treatment of gastric ulcer and chronic gastritis the precursors of carcinoma should lessen the incidence of this disease.

Other conditions of the gastro-intestinal system have been more briefly discussed, and the methods of diagnosis referred to.

Incidences have been given in which disease conditions in other parts of the body have given rise to abdominal symptoms resembling affections of the gastro-intestinal tract.

Hyperchlorhydria has been most commonly found in duodenal ulcer cases, and hypochlorhydria in carcinoma ventriculi, and chronic gastritis.

Hypochlorhydria was found also in cases of pernicious anaemia, tuberculosis and lienteric diarrhoea.

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