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A Lecture ON CANCER OF THE GASTRO-INTESTINAL TRACT.

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BY

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No apology is needed for the institution of this series of lectures by the Manchester Committee on Cancer when we refer to the statistics of cancer in general, and those of the gastro-intestinal tract—the subject allotted to me—in particular.

The returns of the Registrar-General for the last two completed years (1923 and 1924) show that in England and Wales the total deaths from cancer were:

<i>Deaths from Cancer (England and Wales).</i>					
		1923.		1924.	
Males...	...	22,065		23,099	
Females	...	26,603		27,290	
Total	...	48,668		50,389	

In each instance these figures are the highest previously recorded, so that the crest of the wave of cancer mortality has not yet been reached.

Of these 50,389 total cancer deaths 26,670—that is, more than one-half—were due to cancer of the alimentary canal, excluding the buccal cavity.

Deaths from Cancer of the Alimentary Canal, excluding the Buccal Cavity.

	Males.	Females	Total.
Cancer of pharynx, oesophagus, stomach, liver, and adnexa ...	8,552	7,153	15,705
Cancer of peritoneum, intestines, and rectum ...	5,437	5,528	10,965
Total ...	13,989	12,681	26,670

Death Rate per million at all Ages from Cancer of the Alimentary Canal, excluding the Buccal Cavity (1924).

	Persons.	Males.	Females
Cancer of pharynx, oesophagus, stomach, liver, and adnexa...	404	460	353
Cancer of peritoneum, intestines, and rectum ...	282	292	273
Total ...	686	752	626

In every instance, again, these figures are the highest yet recorded.

The same tale is told by our local statistics. The deaths from cancer in the Manchester area have steadily risen from 875 in 1919 to 1,055 in 1925. Of this last year's total, 519 (that is, practically one-half) were of the gastro-intestinal tract, and almost exactly one-third were from cancer of the stomach alone.

In the United States of America, out of nearly 100,000 deaths from cancer every year, more than one-third (roughly 35,000) are due to cancer of the stomach alone.

This high frequency of involvement of the alimentary canal is not altogether surprising when we consider the great variety of substances which we deliberately introduce into it, many of which must prove of an irritant character. Moreover, the very high temperature at which much of our food is swallowed probably plays no unimportant part, since, whatever view we may take as to the final and determining cause of cancer, there can be no doubt but that long-continued local irritation is a very potent predisposing factor. The great frequency of cancer of the stomach has aroused much discussion as to its relation to gastric ulcer, and a few years ago we were all alarmed by the statement of the pathologists to the Mayo Clinic (Wilson and McCarty) that 71 per cent. of the specimens of carcinoma of the stomach removed there showed evidences of preceding ulceration, and that 68 per cent. of chronic gastric ulcers removed under the impression that they were simple ulcers showed early carcinoma at their periphery. So astoundingly at variance with our clinical experience did these statistics seem that, at the request of the Manchester Pathological Society, Dible and Morley investigated a series of cases treated by the surgeons of Manchester and Salford, and they found that of 126 ulcers removed on a clinical and macroscopic diagnosis of simple ulcer none showed any microscopic evidence of malignant change, while out of thirty-three gastric cancers in two only (that is, 6 per cent.) did the clinical and histological evidence point to pre-existent ulceration. The clinical experience of most of us will, I think, lead us to regard the latter view as more nearly representing the truth of the question, which is certainly one of great practical importance in the surgical treatment of gastric ulcer.

In the colon the frequent association of multiple papillomata with carcinoma renders it very probable that many carcinomata in this region arise from malignant degeneration of pre-existent papillomata, and this view is supported by the not very rare coexistence of two or more separate malignant growths in the colon. It is usually held that the lower growths are implantations from that most proximally situated, which is regarded as the primary; another possible explanation, however, is that malignant degeneration has occurred in more than one of multiple papillomata of the colon.

In the short time at my disposal it is quite impossible to deal at all fully with the enormous subject of cancer of the gastro-intestinal tract, and I can refer only to certain points. Inasmuch as the main object of the Manchester Cancer Committee is to improve the results of treatment of this disease, and since success in treatment is dependent upon its early application, I feel I can best utilize the time in considering the early symptoms and the early diagnosis as it affects the stomach, colon, and rectum—the most common sites—and in briefly outlining the lines of surgical treatment for cancer in each of these situations.

CANCER OF THE STOMACH.

When one considers the great frequency of cancer of the stomach—constituting one-third of all cases of cancer—it is very disappointing to find how comparatively few cases come into the hands of the surgeon at a stage sufficiently early to offer a good prospect of permanent success from radical operation. Too much attention has in the past been paid to the classical textbook picture of this condition: the palpable tumour, the vomiting of coffee-ground material, and the marked loss of flesh—together indicating a stage much too advanced for any reasonable hope of cure by surgery. Unfortunately, in the early stages a confident diagnosis from symptoms alone is usually impossible; they serve merely to raise a suspicion of gastric cancer, which may, however, in many cases be supplemented and confirmed by certain methods of physical examination.

The gradual onset of "indigestion," especially when occurring in a male, after mid-life, without any obvious cause, and in one who has not previously been a chronic dyspeptic, should always excite suspicion, arising, as it does, "in the midst of health" (Horder); a long dyspeptic history, even of many years, does not, on the other hand, exclude a carcinoma, since this may be engrafted upon a very chronic ulcer. Loss of appetite is often an early symptom, and may amount to an actual loathing for food even though this causes no pain whatever. An uneasy feeling in the epigastrium, increased eructations of wind often accompanied by a little fluid with an acid taste, nausea after and sometimes before food, and occasional slight vomiting, may all be noted in the early stages of carcinoma of the stomach, as they may also in other and non-malignant dyspepsias, so that there is nothing characteristic in them. The important point, however, is that in early malignancy these symptoms are but little if at all relieved by careful dieting, whereas such usually leads to considerable relief in the case of ulcer and other non-malignant dyspepsias. Later the epigastric discomfort develops into a definite pain, more constant and intractable and less definitely related to meal-times than in ulcer, and, unlike this, seldom relieved by food; the pain is often felt in the small of the back and between the shoulders, as well as in the epigastrium. Vomiting becomes more constant but gives much less relief than in ulcer, and when the surface of the growth begins to ulcerate the vomit has a "coffee-ground" character; a large hæmatemesis is uncommon, and when it occurs is usually the result of the growth eroding into a large vessel, so that it often proves rapidly fatal. In spite of treatment, steady loss of weight, of strength, and of colour are to be noted, and still later an anxious expression, slight fever, and steadily increasing cachexia complete the clinical picture.

The physical findings on abdominal examination depend largely on the location of the growth in the stomach. In pyloric growths, especially if causing stenosis, inspection may reveal the outline of a dilated stomach, sometimes with visible peristalsis passing along it from left to right, and palpation of the relaxed abdomen may reveal a definite tumour just above the navel; in growths of the body or lesser curvature the abdominal findings on palpation are often negative, though sometimes an indefinite mass is palpable deeply under the left costal margin. One should always feel for enlarged hard glands just above the left clavicle in any case of suspected abdominal malignancy, their presence indicating that metastasis has already occurred.

When through some of the already mentioned symptoms and signs suspicion of carcinoma of the stomach has been aroused, how are we to proceed in our investigations? Unfortunately, direct inspection of the stomach by means of the gastroscope has not, as yet, come to be a practicable proposition. Owing to the difficulties and dangers attending its introduction, its limited field of vision, and the impossibility of bringing all parts of the stomach into view, the gastroscope, except in the hands of a very few experts, is not likely to prove of much assistance. The three most generally applicable special methods of physical examination are test meals, the search for occult blood in the stools, and radiography or fluoroscopy after a bismuth meal.

1. Test Meals.

Until the comparatively recent advent of the fractional test meal method the single test meal of Ewald was that universally employed, and it was formerly considered that the absence of free hydrochloric acid in the Ewald test meal indicated carcinoma of the stomach, in contradistinction to gastric ulcer, in which the amount of free hydrochloric acid was held to be increased. It is now recognized, however, that free hydrochloric acid may be absent in conditions other than carcinoma—for example, in pernicious anaemia, in gastric syphilis, in wasting diseases generally, and even in 4 per cent. of normal young men (Bennett and Ryle); anacidity may occur even in some cases of gastric ulcer, especially when located near to the cardiac orifice. *Per contra*, when carcinoma supervenes upon a previously existent gastric ulcer the amount of free hydrochloric acid may considerably exceed the normal. The fractional test meal—in which, after the ingestion on an empty stomach of one pint of oatmeal, small quantities, about 2 c.cm., of the gastric contents are withdrawn by aspiration with Ryle's tube and syringe at intervals of fifteen minutes throughout the whole period of digestion and their hydrochloric acid content estimated—has considerable advantages over the old single test meal of Ewald, and gives more accurate results. Thus, Dr. A. F. Hurst shows¹ that in the cases of cancer of the stomach investigated at the New Lodge Clinic the Ewald test meal showed achlorhydria in 80 per cent., while with the fractional method hydrochloric acid was absent throughout the entire period of digestion in only 63 per cent. In the Mayo Clinic Hartman² reports that with the fractional test meal free hydrochloric acid was absent in only 50 per cent. of their cases of gastric cancer; this anacidity was not influenced by the location of the carcinoma, but was definitely so by the duration of the disease—the more advanced the carcinoma the less often is free hydrochloric acid found. He considers the presence of the free acid to have some prognostic value, since it was found that of the patients with a resectable cancer those with anacidity had a 44 per cent. chance of at least five years of post-operative life, and double the chance of a similar patient with free hydrochloric acid.

The conclusion we arrive at, then, with regard to test meals is that, though of undoubted value as one link in the chain of evidence, yet the presence of free hydrochloric acid cannot be looked upon as exclusive of a malignant growth of the stomach, nor can its absence, in itself, be held to indicate such.

2. Occult Blood in the Faeces.

For this test the patient should be upon a hæmoglobin-free and also a chlorophyll-free diet. If carried out with proper precautions the constant presence of occult blood in the faeces is a valuable sign of malignant disease of the gastro-intestinal tract, and Dr. Hurst states that he has never seen a growth either of the stomach or colon where occult blood was not present. Occult blood is, of course, met with in all cases of active ulceration of the stomach or duodenum, but here the x-ray appearances are usually sufficiently characteristic to prevent error in diagnosis. The persistence of occult blood in a case considered on other grounds—clinical history, x-ray appearances, etc.—to be one of chronic simple ulcer is extremely suspicious of the supervention of a malignant change.

3. Radiography after a Bismuth or Barium Meal.

This is undoubtedly the method upon which most reliance can be placed, and in experienced hands a very high degree of diagnostic accuracy is nowadays attainable.

If the malignant growth has advanced sufficiently to involve all the coats of the stomach the x rays will reveal some defect of contour or some change in the peristaltic movements of the viscus. One must not, however, expect too much from this method, and if the carcinoma be small and has not extended to the muscular coat the x rays may not demonstrate any abnormality. Cancer of the cardiac end of the stomach is especially likely to be overlooked by the radiologist.

In any case where a fairly strong suspicion of carcinoma

of the stomach on clinical grounds is not supported by any definitely positive findings on physical examination (especially with *x* rays), before resorting to exploratory laparotomy the effect of careful diet and medical treatment may be first tried. Sir Thomas Horder advises laparotomy in any gastric case where there is a failure to gain weight or at any rate to maintain weight after the end of the third week of efficient medical treatment. It must not, however, conversely, be too readily assumed that a definite gain of weight under such conditions excludes the presence of a carcinoma, and Dr. Hurst believes that the majority of patients with carcinoma of the stomach gain weight after a fortnight in bed with careful dieting.

Operation for Diagnosis.

Exploratory laparotomy must be more generally adopted than is at present the case if carcinoma of the stomach is to be discovered at a stage sufficiently early to offer a hope of radical cure. Whilst I do not wish to be understood as advocating a wholesale resort to this method of ensuring the diagnosis of all indefinite gastric complaints, yet I would certainly recommend that exploratory laparotomy should be performed where the suspicion of carcinoma on clinical grounds is strong, even if unsupported by any definitely positive finding on physical examination, and where careful medical treatment fails either to increase the weight or to maintain any initial increase. In such cases, even if the operation should, fortunately for the patient, fail to disclose a carcinoma, yet it will generally happen that some other cause for the symptoms will be discovered and surgically remedied.

Operative Treatment.

In the operative treatment of gastric carcinoma one should always aim at a radical operation, and the first question to decide in any given case is whether any condition be present which puts out of court any hope of a radical removal. Such contraindication may be capable of discovery (a) before laparotomy, or (b) only after the abdomen has been opened. Apart from conditions of a general and constitutional nature such as would preclude any severe operation, certain local conditions are definite contraindications: (1) enlargement of the liver, especially if associated with "umbilicated" nodules; (2) ascites of a degree sufficient to be detected clinically; (3) enlarged glands in the supraclavicular region, particularly on the left side; (4) secondary peritoneal deposits engrafted, by gravity, upon the pelvic peritoneum and detectable clinically on rectal examination as an induration of the recto-vesical pouch (a rectal examination should never be omitted when considering the feasibility of radical operation in any abdominal malignant condition, and the detection of induration in the recto-vesical pouch not infrequently prevents a useless operation); and (5) a mass palpable through the abdominal wall is frequently held to contraindicate radical measures, but does not necessarily do so. It depends more upon the question of fixity than of palpability. A palpable mass, if fixed, would certainly prevent a radical operation, but not so if mobile.

Contraindications to radical operation discoverable only after a laparotomy are: (1) small secondary deposits in the liver—these are detectable only when near the surface; (2) peritoneal deposits on the peritoneum of the recto-vesical (or recto-vaginal) pouch too small to be felt per rectum; (3) secondary glandular deposits beyond reach of the operative field, at the hilum of the liver, superior mesenteric, meso-colic, or lumbar glands; and (4) fixity of the stomach to other parts, especially liver and pancreas—such adhesion may be inflammatory only, and superficial slices may be removed from the liver and pancreas with the growth.

If, owing to the presence of any of these contraindications radical extirpation is considered impossible, the next question to decide is whether a palliative operation is advisable. Gastro-enterostomy, except where the growth is near the pylorus, and where obstruction is actually in existence or threatens to be so shortly, gives such a small measure of relief as to be scarcely worth performing. Any palliative operation for carcinoma other than of the pyloric portion should take the form of a partial gastrectomy, and,

provided that the whole of the disease in the stomach can be removed, is well worth while undertaking even though disease be left in the glands, peritoneum, or liver. The immediate results are often remarkably good, and there is always the off-chance that an error in the original diagnosis, or in one's estimate of the extent of the disease, may lead to a pleasant surprise in the form of a permanent cure.

If no contraindications exist radical extirpation should be attempted. A consideration of the lymphatic arrangements shows that the minimum amount of the stomach to be removed lies between a line prolonging downwards the right edge of the oesophagus to the greater curvature and a line one inch beyond the pylorus—that is, the whole of the lesser and about one-half of the greater curvatures are removed. All operations of the type of Billroth No. 1 are, therefore, excluded; Schoemaker's operation is also unsuitable since it leaves too much of the greater curvature. Only operations of the type of Billroth No. 2 or the Polya modification of it—in which the divided stomach is anastomosed laterally to the commencement of the jejunum ("end-to-side" anastomosis), the duodenal stump being completely closed—are worthy of consideration, but time will not permit me to refer further to the technical details of these radical procedures.

CANCER OF THE COLON.

The early diagnosis of cancer of the colon is particularly important since it is one of the less virulent types of carcinoma; it usually runs a slow course, the invasion of the lymphatic vessels and glands is delayed, metastasis is comparatively rarely found and then chiefly in advanced cases. Too much reliance cannot, however, be placed on these features, since occasionally secondary deposits in the liver have been met with even at a very early period. There are two main types of carcinoma seen in the colon: (1) a "cauliflower" or fungating type, which rarely causes any marked degree of obstruction of the bowel, but tends rather to be associated with ulceration, and which is situated mostly in the right half of the colon; and (2) the "ring-structure" type, most frequent in the left half, associated with marked obstruction, and rarely involving any large vertical extent of the bowel.

In the decade 1913-22 inclusive there were 485 cases of malignant growths of the colon admitted to the Manchester Royal Infirmary, located as follows:

Malignant Growths of the Colon (Manchester Royal Infirmary).

Segment of Colon.	No. of Malignant Growths.	Percentage Frequency.
Caecum ...	25 ...	5.1
Ascending colon ...	11 ...	2.2
Hepatic flexure ...	7 ...	1.4
Transverse colon ...	22 ...	4.5
Splenic flexure ...	39 ...	8.0
Descending colon ...	12 ...	2.4
Sigmoid colon ...	143 ...	29.4
Rectum ...	226 ...	46.5

Total ... 485

Of these 485 cases 173 were associated with acute obstruction (35.6 per cent.). Of the growths causing obstruction, 13.2 per cent. were located in the right half of the colon and 86.7 per cent. in the left half—that is, there is a 6.5 to 1 chance of a malignant growth that has caused obstruction being on the left side. Of all causes of acute colonic obstruction carcinoma constitutes 87.9 per cent.

If in any given case of acute intestinal obstruction the site of such obstruction can be located to the colon, and if, further, we can exclude strangulated hernia and acute intussusception as the cause (the former presenting a definite external swelling at one of the hernial orifices, the latter occurring at a very early period of life and having characteristic symptoms), then there remains a 91 per cent. likelihood of the cause being a malignant growth—that is, a 9 to 1 chance.

Symptoms.

The earliest symptoms of carcinoma of the colon are those indicative of some defective action of the bowels, and are of especial importance in those whose bowels have always previously "acted like clockwork." The first change noted is usually a steadily increasing difficulty in

obtaining a satisfactory action of the bowels, necessitating the use of purgatives in gradually increasing doses. Periods of increasing constipation frequently alternate with short periods of diarrhoea, the gradual accumulation of faeces above the malignant stricture acting as an irritant and setting up a local intestinal catarrh with increased secretion of mucus; this causes a softening of the faecal mass, and leads to its expulsion in several frequently repeated small evacuations mixed with much mucus and occasionally with a little blood even in an early stage. Later the more powerful peristalsis of the hypertrophied bowel proximal to the stricture causes colicky pains, at first very slight, but gradually developing into definite "cramps." Such are often induced by the taking of food, since the entrance of food into the stomach starts peristalsis in the intestines; on this account these pains are often ascribed to "indigestion," and the stomach instead of the bowel is considered to be at fault. This increased peristalsis sometimes causes a desire to go to stool after each meal—a very suspicious sequence—when mucus only, or possibly a slight amount of blood in addition, is passed. Sooner or later these colicky pains are associated with rumblings of flatus, and these may become so loud as to be audible to other persons in the room. In many cases the patient volunteers the information that he feels the gripping pains to cease always at the same site—where also the "rumbling" starts—and he can thus, with remarkable accuracy, indicate the location of the obstructing growth. Needless to say, these colicky pains are all made much worse by the taking of a purgative. After a time abdominal distension follows from the accumulation of flatus and faeces proximal to the stricture and is at first localized to the bowel just above it, so that, if seen at this stage, a further clue may be obtained to the site of the growth. The "cauliflower" type of neoplasm, such as is met with chiefly in the caecum or the right half of the colon, is not usually associated with these evidences of obstruction, but tends to ulcerate early and to lead to diarrhoea and the passage of mucus and blood per anum, thus simulating mucous colitis; it is in this type that blood may be lost in small amounts over a long period of time and produce so high a degree of anaemia as to lead to an erroneous diagnosis of pernicious anaemia.

The early physical signs are those of gradually increasing distension and hypertrophy of the bowel proximal to the site of the growth, the outlines of individual dilated coils being visible under the abdominal wall together with a visible peristaltic wave passing at intervals along them. Even when not actually visible the passage of the peristaltic wave can often be appreciated by palpation over the distended bowel as a very definite temporary hardening of its wall, followed by relaxation and softening—the so-called "palpable peristalsis." This is best elicited over the caecum, this portion of the colon, particularly if the ileo-caecal valve be competent, being that which is most distended and which is, in consequence, the first to rupture in advanced degrees of obstruction. Too much stress cannot be laid upon the diagnostic importance of this combination of dilated intestinal coils with visible (or palpable) peristalsis—it invariably denotes the existence of intestinal obstruction. In the normal state neither peristaltic waves nor the outlines of individual coils of bowel are ever visible through the abdominal walls, though rarely these phenomena may be seen beneath the thinned-out covering of large ventral herniae, in cases of wide divarication of the recti muscles, and also in extreme degrees of emaciation. Even in these instances, however, the coils observed are of normal size and not distended, and are not really exceptions to the rule that whenever we can see clearly the outlines of coils of distended intestine, together with a peristaltic wave passing along them, we can diagnose intestinal obstruction of a subacute or chronic character with absolute confidence. At first the abdominal distension is confined to the course of the colon and is noted chiefly in the flanks; later on (and almost from the first in those cases where the ileo-caecal valve is incompetent) the distension affects the lower coils of the ileum, which become folded in a more or less transverse direction, constituting the well known "ladder pattern" of the abdomen.

Auscultation—a much neglected method of physical

examination of the abdomen—is often extremely useful if one is conversant with the character and site of the normal intestinal sounds and of the alterations in tone, intensity, and distribution met with in obstructive conditions.

In many cases a tumour may be felt somewhere along the course of the colon, and this is more frequently possible in the right half of the colon and with the "cauliflower" type of growth. A palpable swelling must not, however, always be assumed to be the growth itself, and this specially applies to the annular type usually met with in the left half of the colon, which is of insignificant vertical extent and too small to be palpable from without; the swelling actually felt in such circumstances is more likely to prove a mass of hardened faeces collected just above the malignant stricture, and may completely disappear with purgatives or after an enema; such disappearance must not, therefore, be considered, as it unfortunately is so frequently allowed to do, as excluding the presence of growth, rather should it induce a more careful search for any possible organic cause of such holding up of faeces. A secondary malignant deposit in the liver, and even the hypertrophied and distended caecum (particularly if felt when stiffened by the passage of the peristaltic wave), have been mistaken for a growth in the colon. A careful rectal examination should always be carried out, even though, except in rectal growths which we shall separately consider, one cannot expect to feel the actual growth itself. In the case of growths situated low down in the sigmoid colon, however, it is sometimes possible to detect the mass by palpation through the anterior rectal wall; in other cases the indurated and infiltrated peritoneum of the pouch of Douglas, often present in advanced abdominal malignancy, irrespective of its primary site, may be recognized; and in others, again, the characteristic "ballooning" of the rectum so often associated with growths in the sigmoid or descending colon can be detected.

The sigmoidoscope is a very valuable aid in the diagnosis of growths in the lower sigmoid, but requires care and experience in its use and in the interpretation of what is seen; through it small portions of a doubtful growth may be snipped off for microscopical examination. Multiple papillomata may be seen, and are so frequently associated with malignant growths higher up the colon that their presence, if associated with any other symptom or sign of cancer of the colon, is sufficient to justify an exploratory laparotomy.

Of all the methods of physical examination of the colon the most important is that of radiography after a barium meal, and particularly after a barium enema. The barium meal is useful in ascertaining the general function of the colon, but the barium enema is of greater service for the localization of an obstruction in the colon. The enema is administered with the patient lying flat, and, if no obstruction be present in the colon, it should travel round to the caecum within a few minutes. It must, however, be borne in mind that a growth producing partial obstruction only does not necessarily interfere with the passage of the barium enema, and may therefore be easily overlooked. Moreover, a malignant stricture in the sigmoid may be obscured by an overlying barium-filled coil, especially when a barium meal has been given; or, as Pannett has pointed out,³ if the affected bowel lies with its axis in the direction of the x rays the defect in the barium shadow will not be seen. The findings of barium meals and enemata should be verified by a second examination to minimize the possibility of error.

Treatment of Cancer of the Colon.

In the treatment of carcinoma of the colon the ideal at which we should aim is complete excision of the segment of bowel containing the growth together with its lymph-bearing area, and followed by immediate restoration of the continuity of the bowel. Apart from consideration of questions of a general or constitutional nature, this ideal treatment may be contraindicated by (1) secondary deposits in the liver; (2) metastatic peritoneal deposits—especially likely to occur in the pouch of Douglas; (3) glandular involvement beyond the limits of practicable surgical removal, and (4) local extension and fixity. Of these, the first and second are, of course, absolute contraindications

to radical operation, but with regard to glandular enlargement it must be remembered that this is not necessarily of a secondary malignant character, but may be of an inflammatory nature only, due to associated sepsis. Local fixity, moreover, rarely prevents radical measures, since by free division of the peritoneum along the outer border of the colon, many growths which at first sight appear too fixed may be rendered sufficiently mobile for excision. If a radical operation be definitely contraindicated then a "short-circuit" (that is, lateral anastomosis) should be performed, provided there is a sufficient length of colon below the growth to permit of approximation to the distended bowel above without undue tension. Only when a "short-circuit" is quite impossible must we, as a last resort and to prevent future intestinal obstruction, fall back on colostomy proximal to the growth.

Many cases, however, are already associated with intestinal obstruction when first seen, and it is imperative that this be relieved before any radical extirpation with restoration of the continuity of the bowel be attempted, since it is the universal experience of surgeons that resection of the colon in the presence of obstruction is a very unsafe procedure—the congested and oedematous wall of the bowel failing to hold the sutures properly, so that leakage at the suture line is very probable. In such cases the best course, I believe, is to perform caecostomy under nitrous oxide or local anaesthesia; only when, by this means, complete relief of the obstruction has been attained must recourse be had to exploratory laparotomy with a view to radical removal of the growth and restoration of the continuity of the bowel. If after this has been accomplished the caecostomy does not close spontaneously, a slight plastic operation will suffice for its obliteration.

CANCER OF THE RECTUM.

It is an extremely unfortunate fact that at the present time fully 75 per cent. of the cases coming to our hospitals with cancer of the rectum have already reached a stage much too advanced for any hope of radical operation. This is surprising when it is remembered that such growths are readily available to rectal palpation, and it is largely the neglect to make a digital examination of the rectum whenever patients come complaining of rectal symptoms that is responsible for this lamentable state of affairs. Even when blood has been passed per anum it is not uncommonly too readily assumed that it is due to the commonest cause—piles—without a digital examination.

Symptoms.

The early symptoms of rectal cancer are often indefinite, and are essentially those already described for growth of the colon. A patient whose bowels have previously acted regularly, on going to morning stool and thinking to have a normal motion, finds instead that he passes mostly blood-stained mucus and flatus, and that he has to repeat his visit very shortly, possibly for several times, before he obtains relief. This "spurious diarrhoea" is really indicative of constipation. Severe bleeding from the rectum is uncommon except in an advanced stage, but occasionally it may be an early symptom, and then, fortunately, alarms the patient and leads him to seek advice in an early and operable stage. Pain is often completely absent in the early stages; if present it may be felt in the rectum, in the sacrum, or over the lower abdomen. An alteration in the shape of the faeces, chiefly in the direction of flattening, is sometimes noticed early, especially in the stenosing type of growth and when situated near to the anus; with a high growth the faeces may be remoulded in the rectum after passing through the stricture and thus appear of normal shape.

Diagnosis and Treatment.

Suspicion of rectal trouble having been aroused, a digital examination should be made forthwith, and should it prove negative a sigmoidoscopic examination should follow, since the commonest site of growth is the recto-sigmoid junction, and this may not be reached by the examining finger. Bimanual examination with the forefinger of one hand in the rectum and the other hand flat on the lower abdomen sometimes enables an otherwise impalpable growth to be discovered. By digital examination is determined, not only

the presence of a growth in the rectum, but also the extent to which it has already involved the adjacent structures—prostate, bladder, vagina, uterus, and sacrum. If not fixed to any of these, and if no enlargement of the liver can be felt (or of the inguinal glands in cancers involving the anal canal), then the question of a radical operation must be considered. The possibility of this cannot be finally determined until, as the first operative step, the abdomen has been opened and the presence of metastasis in the liver or peritoneum, or the too extensive involvement of lymphatic glands, definitely excluded. It has, unfortunately, been my experience on more than one occasion to find that with a comparatively small and freely mobile rectal growth—and presumably, therefore, an early one—a secondary deposit in the liver has been disclosed on opening the abdomen, and the contemplated radical operation thereby prevented. We need not to-day enter into the much discussed question of the relative merits of the two chief radical operative procedures at present in vogue: (1) the abdomino-perineal operation perfected by Miles, and (2) perineal excision following a preliminary colostomy; they both entail a permanent iliac anus as part of the price the patient is called upon to pay for any hope of cure of a rectal cancer. Possibly, in the future, with cases presenting themselves at an earlier stage and with a better selection of cases, it may be feasible to remove the rectum with preservation of the sphincters and restoration of the continuity of the bowel, but at present such is not to be recommended.

If a radical operation be deemed impracticable, either because of the local extent and fixity of the primary growth or because of the presence of metastases, then the question of a palliative colostomy has to be considered. This should certainly be performed wherever there is any evidence of actual or of shortly threatened obstruction, and considerable relief may be expected therefrom. In the ulcerative types of growth obstruction is not a marked feature, and the patient's chief distress is occasioned by the profuse discharge of blood and muco-pus from the growth, necessitating the passage of very frequent stools; although by diverting the faeces from the growth colostomy may be reasonably expected to diminish the amount of this discharge, yet sufficient may remain to cause patients to express disappointment at the small measure of relief afforded them by the operation, and this should be fully explained to them before their consent to colostomy is obtained.

REFERENCES.

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THE THYROID GLAND IN THE FULL-TIME HUMAN FOETUS AND IN THE NEWLY BORN INFANT.

(With Special Plate.)

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INTRODUCTION.

VARIOUS descriptions have been given of the appearance of the thyroid gland of the human subject about the time of birth. The majority of workers have recorded a condition very different from that seen in the normal adult gland, and several have advanced hypotheses to explain it.

It would seem that typical colloid appears at some period of intrauterine life. Elkes (1904) described it in foetuses from 4½ to 6½ months, Livini (1922) in embryos of 62 to 66 mm., while Müller, Peremeschko, and Bœchat, cited by Mérozy-Tydan (1910), found it present, the first in a foetus of 5 months, the others at a later period. Wölfer (1880), however, was of the opinion that colloid formation did not commence until the end of foetal life or even till after birth. Treating this investigation from the chemical standpoint, Marine (1922) states that the iodine content of the thyroid increases with the increasing age of the foetus. Fenger