1907, when he had another attack of haematemesis, but not so severe, and he soon resumed work. A third attack occurred in February, 1908, a fourth in April, 1908, and the last in November, 1908. Between these attacks he has been absolutely free from all stomach trouble. His wife says that these attacks have always been brought on by overwork, but admits that he drinks more than an ordinary amount of alcohol.

Examination of his stomach contents after a test meal (toast and tea) shows the presence of free HCl. Lactic acid or other abnormal constituents are not present. Four hours after a test meal of beef, potatoes, and pudding a small amount of meat fibre was washed out of the stomach.

Röntgen-ray Examination.—His stomach was first washed clean with water and the bowel emptied by an enema, which acted well. Eight ounces of hot bread and milk thoroughly mixed with 1 oz. of bismuth carbonate was then given him to eat. Ten minutes after the food had been taken, with the x-ray screen a distinct shadow was seen. The lower outline was definite, and the lowest point was 1½ in. above the umbilicus. The thickest part of the shadow was towards the cardiac end of the stomach, and it gradually tapered towards the pyloric end (see Fig. 5); twenty-five minutes after food the upper outline, which was never as clear as the lower, showed less clearly, and the whole mass looked narrower. In addition to the projection to the right of the midline and some increased darkening towards the pyloric end, there was a definite shadow leading vertically downwards from the lower border of the stomach shadow (see Figs. 6 and 7). That this was not the spinal column was proved by the facts that it was not seen earlier and did not appear above the stomach shadow. The patient was standing up during each examination.

Our interpretation of the findings is that the projection to the right represents the pyloric antrum, and the vertical shadow food escaping through the artificial opening into the jejunum.

For the laborious work of tracing these cases and collecting the notes we are indebted to Mr. Hamilton Drummond.

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PAIN IN MUCOUS COLITIS AND IN IRRITABLE STATES OF THE COLON IN GENERAL.

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UNDER the term "mucous colitis" I include all cases in which there is excess of mucus in the stools, without evidence of ulceration or any definite organic disease; and I do not distinguish between mucous colic, mucomembranous colitis, and simple catarrhal colitis, for I feel convinced that all these complaints have underlying them one pathological condition—namely, an irritable state of the bowel wall, to which the term "catarrh" is fully applicable. The agency producing catarrh of the colon may not always be the same, just as is the case with other mucous membranes. For instance, a bronchial catarrh may be due to an ordinary cold or to the influenza bacillus, or to rheumatism or some other agency.

The secretion of mucus, whether as a liquid, a semi-solid, or as membranes or membranous casts, is, I feel certain, the result of an irritation of the mucous membrane of the bowel. This undue irritability of the bowel may also express itself by pain, the result of abnormal muscular irritability. In very many cases the muscular irritability and the pain which results occur unaccompanied by any mucus or signs of irritation of the mucous membrane. In such a case, while the motor symptoms show irritability of the colon, the condition cannot rightly be called one of mucous colitis. I find this type of colon affection an extremely common one, and I would like to see the term "catarrh of the colon" used to embrace all cases in which there are symptoms due to the irritability of the colon, whether of its mucous membrane or of its muscles.

Pain, although usually present, is not, however, a necessary accompaniment of mucous colitis, and therefore what I have to say is more generally applicable to the larger class of case in which pain in the colon is a prominent symptom, and the appearance of mucus in the stools, while often present occasionally, is by no means a prominent symptom. The pain of which I am speaking seems to be usually due to a peculiar and hitherto little recognized form of muscular activity, which is associated

with varying degrees of hardness of the bowel, combined with a varying amount of increase in its transverse diameter. This peculiar change in the bowel wall is due, I am convinced, to the development of abnormal tonic activity in the muscular coat.

By the careful palpation of the colon in a long series of cases it is comparatively easy to train the hand to distinguish between the presence of normal and of this abnormal muscular tone in the bowel.

PALPATION OF THE COLON.

Where the tone is normal, the colon can be felt in the left iliac fossa as a single fleshy cord, of some ¼ in. or ½ in. in diameter, which can be rolled under the finger without any material discomfort to the patient, unless he be very sensitive; sometimes, in addition, a sense of the presence of air and liquid in the nearly empty bowel can be felt on either side of the muscular cord, showing that this cord is not the whole of the gut, but only one of the longitudinal muscular bands. Sometimes, on the other hand, it is impossible to believe otherwise than that the fleshy cord felt is the whole of the gut completely contracted to the size sometimes of the little finger or less.

In the case of the caecum in the right iliac fossa a similar sensation of a fleshy cord with some crepitus, due to air and liquid, on either side of it may also sometimes be felt, and, in addition, a somewhat firmer and smaller fleshy cord may be palpable external to it, which is the vermiform appendix. Often the presence of the appendix cannot be made out, but sometimes it is quite distinct and clearly to be felt. Where the intestinal wall is found to be of this normal degree of hardness, there is, in my experience, very little probability that the colon is the source of any abdominal pain from which the patient may be suffering, and some other cause will be found for it.

In very many patients, on the other hand, a greater or less degree of abnormal hardening may be felt in the wall of the colon, varying in degree and extent from the well-known hard tumour of some 2 in. or more in diameter, which occupies the situation of the caecum in most cases of moderately severe acute appendicitis, and which is shown by careful examination to be the caecum distended with gas and with its walls of board-like hardness, down to a degree of hardness and distension which is very little removed from the normal.

The same is true of the sigmoid flexure. It may sometimes be felt, in cases of well-marked mucous colitis, to be a tube with rigid walls of 1½ in. in diameter, and sometimes with localized irregularities suggestive of contained scybala, but which continued palpation shows to be true muscular hardenings which disappear under the fingers in a way which no scybalous mass could. This condition of hardness and increase in size may vary from this somewhat extreme degree down to one but slightly removed from normal, according to the severity of the agency which is producing the abnormal tone.

The same may also be said of the rectum above Houston's valve; I have felt this portion of the bowel harden up under my finger until it formed a cylindrical tumour of almost cartilaginous hardness and then soften again during examination. Localized hardenings of this or of a lesser degree I find to be of much more frequent occurrence in the rectum of patients suffering from mucous colitis and irritable colon than I imagined before I examined the rectum as frequently as I now do in such cases. As it is only within the last few years that I have detected this hardening of the upper part of the rectum, I cannot speak of a long series of cases of the extreme degree here described, though it is unmistakable in those I have observed. I have met, as yet, only one or two cases of cartilaginous hardening of the valve as described, and only a few of the complete annular hardening of the gut above the valve, but I have seen many cases of partial localized hardening of its wall, and in cases suffering from painful spasmodic contraction of the colon, whether the symptoms be typical of mucous colitis or not, I have frequently found some degree of transient muscular hardening causing the bowel to be palpable as a softish, flattened, fleshy tube of the size of the thumb, or less, instead of being thin walled, as in the normal rectum.

It is evident that the series of phenomena I have just described cannot be explained by means of the acknow-

ledged theory of muscular action and muscular tone. Contraction of muscular fibres surrounding a thin-walled tube cannot convert that tube into one with rigid walls and a well-marked lumen.

Transverse Contraction of Muscular Fibres.

It is at last beginning to be acknowledged that muscular fibres have two forms of activity instead of only the one which most physiologists recognize, and before long it will be generally recognized that a muscular fibre has not only the power of shortening itself by its longitudinal contraction, but also the reverse power as well, and that by a transverse contraction of its protoplasm it can lengthen itself.

The phenomena which I have been describing are the result of some abnormal stimulus causing the involuntary fibres of the bowel wall to hold themselves rigid in the extended position by an act probably of transverse contraction.

Expansile Tone.

We must in the light of this theory reconsider the question of muscular tone in the bowel, and consider that instead of there being only tonic contraction or contractile tone, there are two opposing types of tonic activity—namely, contractile tone and expansile tone. In the normal bowel, whatever part may be played by the expansile tone, that part is not very evident.

In the case, however, of some pathological irritants a certain proportion of the muscular fibres seem to be stimulated to expand rather than contract (unless it be conceivable that the combined action may take place in each individual fibre), and, if this abnormal activity be sufficiently marked, a condition of what may be called expansile tone will result. Instead of the bowel being hard and small, it will be hard, but with a well marked lumen, or, at all events, with a diameter larger than that which results from contraction alone.

I believe that the rigid arched abdomen so characteristic of peritonitis is an instance of a similar state of tonic expansion on the part of the striped muscular fibres of the abdominal wall. I have always found it difficult to understand how a rigid arch could be formed by contractile activity of the muscles, for contraction would make a straight line, not a curve. The possibility of the fibres being in active expansion is a most welcome solution of this problem. If it be acknowledged that tonic activity in the bowel is of two kinds, which are opposed to one another, it is quite easy to understand the *rationale* of many abdominal pains which would otherwise be difficult of explanation. For the explanation of pain by suggestions of flatulence, colicky action or neuralgia is not adequate for many of the continuous dull aching pains to which the colon is subject.

In the normal bowel contractile tone is paramount, and the normal condition of the empty bowel is probably one of almost complete obliteration of its lumen by a full, but not forcible, contraction of the circular fibres of its muscular coat.

Pain caused by Expansile Tone.

When, however, some pathological irritation induces the expansile activity in some (or all) of the muscular fibres a conflict between the two tendencies occurs, the stronger overpowers the weaker, and the result is pain, as is always the case when a muscle is attempting a load beyond its power.

In a section of the bowel where there is this conflict between fibres trying to maintain expansile tone and those trying to maintain contractile tone there will be a dull, aching muscular pain. Again, supposing that the pathological stimulus to expansion has so far superseded the normal one to contraction that the bowel is held tonically expanded to a greater or less extent (and it is not common to find the colon expanded to more than three-quarters of an inch to 1 in. in diameter, although it may occasionally be as much as 2 in., or even more), there may be little or no continuous pain in the bowel. In such a case as this, although there is no pain when at rest, there is certain to be pain, and perhaps severe pain, as soon as any peristaltic activity commences in this part of the bowel.

The powerful contractile activity which accompanies peristalsis will overmaster the fibres which are in a condition of expansion and crush them together, giving rise to

an amount of pain proportional to the strength of the abnormal expansile stimulus. In this way a pain which is one of the varieties of colic may be produced by a very different mechanism. In colic a part of the bowel is occluded by an excessive amount of contractile action, and the peristalsis of the neighbouring part is endeavouring to force the intestinal contents through the spasmodic stricture. In the case I have been describing the bowel is held open, to some extent, owing to the presence of some expansile spasm and the initial contraction of the peristaltic wave causes its forcible occlusion.

Having thus given my theory of bowel tone, which seems the only feasible explanation of the phenomena with which I am dealing, it will be more easy to understand the etiology of the cases of bowel pain with which I wish to deal.

REFERRED PAIN OF COLON ORIGIN.

Pain arising in the colon obeys the law which governs the relationships of the abdominal viscera to the sensory mechanism. The relation of the colon to the spinal cord and its sensory mechanism resembles that of most of the other abdominal viscera, in that painful impressions seem as a rule to travel along afferent channels which are not regularly used for common sensation; therefore, when the painful impulses reach the spinal cord and cause disturbance of the segment which they enter, the origin of that disturbance is not localizable by the patient, but is simply appreciated as segmental pain, and is interpreted as coming from some place in the skin area from which that segment usually receives ordinary sensory impulses. In other words, pain arising in any particular part of the colon is not, as a rule, felt as pain where it arises, but is felt as referred pain in the skin area which corresponds to the segment of the cord which receives the painful impulses from the colon. The presence of hyperaesthesia of the skin area to which the pain is referred is often of considerable value in cases in which it is not easy to decide whether the pain is a referred one or not.

As the colon from its start to its termination is in correspondence with some twelve different segments of the cord, there is a very wide choice of situations to which pains may be referred. It is this fact of the reference of colon pain to such widely distant skin areas that makes the diagnosis of the source of these pains so difficult until this fact be realized. Thus, within the month before writing this, I saw one patient in whom pressure on the colon caused a severe pain in the backs of the legs and toes, which lasted five minutes or so (first and second sacral segmental areas), and one in whom pressure on another part of the colon caused pain at the xyphoid cartilage and under the right scapula (seventh dorsal segment area); yet both might be cured by similar treatment.

I am not able to do more in the compass of this paper than name some of the most frequent or striking areas to which pain is referred, without giving details of the individual cases concerned. Perhaps the commonest site in colitis is the lower abdomen below the umbilicus, especially on the right or left, according to the part of the colon mainly involved, the segmental area being, as a rule, the tenth, eleventh, or twelfth dorsal. Where the transverse colon is mainly involved the pain is most apt to be felt across the epigastrium above or at the level of the umbilicus—that is, directly over the bowel itself. A very common situation for the reference of colon pain is in the hips over the twelfth dorsal or the first four lumbar segment areas, and the commonest points are $1\frac{1}{2}$ in. below the centre of the iliac crest in the twelfth dorsal area and in the region of the posterior superior spine of the ilium. Pain is also very often referred to the sacrum over the situation commonly associated with uterine disturbance.

It is very common for colon pain to be referred to the flanks or to the gastric area, or sometimes below the scapulae and to the lower dorsal segment areas. Sometimes colon pain is all referred to one spot, $1\frac{1}{2}$ to 2 in. across, just above the pubes (right and left twelfth dorsal areas), sometimes it is referred to a spot within the pelvis, between the base of the bladder and the obturator region. Sometimes the pain is referred to the region of the sciatic notch—that is, the third sacral area—sometimes down the legs even to the feet (first and second sacral).

Sometimes all the pain is referred to a fixed spot over the upper lumbar vertebrae (ninth, tenth, or eleventh dorsal areas). The pain arising in any part of the colon may therefore be all referred to some single skin area. In such a case no matter whether the ascending, transverse or descending colon be pressed on, so as to cause pain, it will be found that the pain occasioned will always be referred to the one spot, either above the pubes, over the upper lumbar vertebrae, midway between the umbilicus and Poupart's ligament on the left side, or at the xyphoid cartilage, or wherever else the one spot of reference may be. It is, however, more common in any particular patient for pain produced in the ascending colon to be referred to some one spot (not necessarily on the same side of the body), that produced in the descending colon to some other spot, and so on. Sometimes pressure on the lower part of the sigmoid will give pain in one place, and that on its upper part in another, and the same is often true of the caecum.

Reference of Rectal Pain.

When the upper part of the rectum is specially involved the pain is apt to be felt in the sacral region and it may be felt down the backs of the legs and even into the feet. A very interesting case of this description was sent to consult me by Dr. Christopher Martin, who recognized that the pain in the back from which the patient suffered was not due to the pelvic organs, but was part of a general colitis.

Mrs. R., aged 45, complained of pain at the bottom of the back and over the lower abdomen and also right down the legs to the feet, especially in the back of the legs and heels. She could not walk more than two miles, and some days not a mile, because of a dragging sensation in the abdomen and a constant pain in the back. She had no leg pains on walking. Sometimes on walking there was the sense of a tight cord in the right groin (iliac fossa) which was too tight to allow her to bring her legs forward. This came on quite suddenly sometimes, and then she had hard work to walk home. There was often some numbness and tingling over the back of the thighs and the calves. She had also a sense of weight across the lower abdomen which was apt to be worse in bed, and she was unable to lie on her back because of sacral pain when she did so. She had a good deal of epigastric pain, but it was not, as a rule, worse after meals. The tongue was clean, the appetite poor, and the bowels only open after large doses of medicine.

The colon was tender throughout, and the caecum especially so. The transverse colon was hardened enough to be palpable across the abdomen, but neither the caecum nor the sigmoid flexure was especially enlarged or hard; the sigmoid was slightly hard and contracted, rather less than $\frac{1}{2}$ in. in diameter. On examining the rectum Houston's valve was found to be hardened abnormally, but not to an extreme degree, but the bowel above it was felt as a moderately hard fleshy cord of the size of the thumb (say some $\frac{1}{2}$ in. in diameter). This was extremely tender, and moderate pressure upon it with the finger caused severe sacral pain, which shot down the backs of both thighs and legs to the soles of the feet, and was especially bad in the great toes. The pain remained in the legs and feet for five minutes or so after the examination. In this case, without any leading questions, the patient indicated with considerable exactness the usual sites of reference for the fourth, third, second, and first sacral segments as shown in Dr. Head's diagrams.

Pain in Relation to Meal Times.

The pain is very apt to occur in relation to the taking of food. It seems certain that the physiological activity of the stomach which occurs at meal times does spread to the intestines and does involve the transverse colon (whether because of the proximity of the two organs or through the nervous system I am not prepared to say); consequently, especially in the case of irritability of the transverse colon, pain after meals is a very common symptom, due probably, as was suggested earlier in this paper, to the conflict between peristaltic contraction and the abnormal expansile tone present in the bowel. In a well-marked case of this sort the transverse colon may be so hardened by its abnormal tone that it is clearly palpable all the way from the hepatic flexure across the abdomen to the sigmoid flexure. In some cases the whole colon is continuously palpable; in others portions only are hard for a time and then relax again; and therefore the whole transverse and descending colon are not palpable at one and the same time.

It is not very uncommon for the pain to come on before the meal is commenced. Thus some ladies have an "afternoon tea" pain, which comes on as soon as the tea-tray comes into the room and renders them very uncomfortable; or it may come on before the midday meal, as was the case with a young man aged 24, who said that pain used to come on just before dinner. He

would sit down to dinner thinking "Well, I could do with it now," and then the pain would come on across the abdomen and "draw him double," and thus deprive him of his anticipated enjoyment; or, as in the case of a young woman of about 24, who said the pain used to come on as soon as she got home and saw the dinner on the table.

Again, the pain may come on in relation to defecation, but this is far less common than that after food, except in well-marked cases of mucous colitis.

Or the pain may come on at irregular intervals without any definite relationship to the functional activity of the colon being traceable. This is usually the case with the severe types of colic pain due to mucous colitis. These pains seem in some cases to be purely spasmodic and purposeless, in others they seem to be purposeful, and caused by the increased muscular action needed to detach adherent membranous mucous casts from the lumen of the bowel.

Pain on Exertion, etc.

Another characteristic of the pains resulting from irritability of the colon is the fact of its occurrence as the result of mechanical stimulation.

The shaking of the colon which occurs in the act of walking or from the vibration of a jolting conveyance, such as an omnibus or tram car, is very apt to precipitate painful contractions in an over-sensitive colon, and of this I could cite many instances. The transverse colon with its somewhat loose attachment is much more likely to be affected than other parts by mechanical vibration, and it is therefore in cases of irritability of this portion of the colon that pain is most apt to occur on exertion, as in the case already cited. As we have already seen, the transverse colon, when over-sensitive and subject to the abnormal expansile tone, is very apt to become painful after meals. Now it is not infrequently noticeable that though the colon is not sufficiently irritable to be subject to attacks of pain after meals, or on exertion alone, yet when the two factors are at work together pain is the result, and I have met with many patients in whom pain on exertion only occurred if it were taken within a couple of hours or so of a meal. I need only give one example, and that one I am certain of, for I myself was the subject of it. I shall not easily forget the annoyance and humiliation of a walk one Sunday afternoon on a Scottish moor. I walked a couple of miles or so with little discomfort, but had to rest every hundred yards or so on my return, owing to the onset of a severe aching pain in the lower epigastrium. I had had the pain occasionally for some weeks, and it would occasionally come on during the 300 yards walk which I had to take daily on returning after lunch at my club. My then explanation was that it was due to gastric atonicity and the over-taxing of the gastric muscles, although it did not yield to acids and strychnine. This erroneous diagnosis was not corrected as the pain was cured by the Scottish holiday. It was not till the following year, when I had a return of the same pain, that I recognized its colon origin, and was able to cure it by medicine in a few days.

Again, pain in an over-sensitive colon may be brought on by mechanical pressure exerted upon the abdominal viscera in such exercises as rowing. This is of course especially the case when the bowel is tender. In such cases of tenderness a woman cannot walk about in corsets or with anything tight round the waist because of the pain which such pressure produces. In such a case the patient will complain of pain on stooping to fasten her boots, as with gastric tenderness; or the pain will be severe after any form of exertion which causes much tightening of the abdominal muscles.

As a very good illustration of the types of pain occurring on exertion, I give the notes of a case under the care of Dr. Alexander Bryce of Moseley. As the patient is himself a medical man, and the notes are in his own words, the record is a valuable one.

For twenty-five years quite I have had pain after meals if in the erect posture. As this was in the epigastrium I used to think it was gastric; a few minutes' rest after meals in a reclining position caused it to disappear. I seldom feel it now unless when rushed after a meal.

Much standing causes pain, but this is mainly in the sigmoid and caecum.

Attendance at an instrumental delivery, at any rate if of a

prolonged character, causes fairly severe pain in the transverse colon.

Cycling at times induces pain in the transverse colon, but often in the sigmoid and caecum.

Contraction of the abdominal muscles in physical culture exercises induces very severe pain in the transverse colon.

The most severe pain I ever had, however, was some four years ago, brought about by half an hour's rowing in a petty-fogging little pleasure boat on the canal. The pains lasted five days in the transverse colon, and were followed by the passage of much mucus. I was much annoyed at this, for I, for one year at least, took honours for oarsmanship in respectable gigs, and to be let down by a poky little bumboat was rather humiliating.

Another severe attack of pain in the transverse colon was induced by supporting my wife in an effort to teach her to swim. As this occurred whilst I was in bathing costume, and in the open sea, perhaps the exposure (prolonged for only fifteen minutes, however) may have had something to do with it.

Croquet, unless in the erect posture, and lawn bowls, produce slight attacks.

My latest discomfort has been during my apprenticeship in motor driving; the changing of gears caused decided pain, but I am pleased to say this was not severe, and appears to be passing away.

PATHOLOGY.

The main clinical feature of this condition is undue irritability of the muscular coat of the bowel. This, in the case of mucous colitis, is associated with a discharge of altered mucus, which suggests undue irritation of the mucous membrane as well. In, however, very many cases in which pain is of colon origin, the irritation appears only to involve the muscular coat and not the mucous membrane to any perceptible extent.

Irritability of the muscular coat may arise in one of two ways—either by undue irritability of the general nervous mechanism, or by local irritation of the muscles themselves; and it is probable that this irritability of local origin may be due either to the absorption of some toxin from the bowel, or by the circulation of some muscular irritant in the blood.

My own belief as to the pathology of this condition is as follows: This abnormal expansile tone is the result of the presence in the colon of an abnormal amount of some irritating toxin or other substance which normally is present in a small amount, or not at all, and is due to bacterial activity. The correctness of this theory is suggested by the fact that intestinal antiseptics are of great value in treating this condition.

The toxin, if such it be, is probably due to abnormal activity of the *Bacillus coli*, or some other of the many denizens of the colon. When sufficient in amount the irritant will induce symptoms, but when insufficient its action may be aided and symptoms produced by any one of the many ways in which the irritability of the bowel may be heightened. Thus it is not at all infrequent for colon pains to come on at about 4 o'clock in the morning, at the time when "gouty" pains are apt to occur. Moreover, there is no doubt that patients are more apt to get colon pain when there is an excess of uric acid and its congeners in the blood. Dr. Haig gives some convincing experience as to the power of uric acid in inducing an attack similar to appendicitis, and certain it is that many attacks of what is apparently mild appendicitis, with expansile spasm of the caecum, yield rapidly to sodium salicylate.

Influence of Nervous Instability.

An important factor in all cases is the degree of stability of the nervous system. It is extremely frequent to find that a patient is quite well so long as his nerve tone is good, but as soon as worry or overwork causes nervous instability then colon pain comes on. My own experience, where a holiday quite sufficed to cure an undiagnosed attack of colon pain, is, I have no doubt, the experience of many others also.

It is not the nerve instability which causes the colon pain, but it is often the determining factor which enables the otherwise ineffective irritant to become effective and produce symptoms. This fact—for such I have confidence in calling it—gives the key to the relationship which exists between colitis, or colon pain, and nephroptosis and other causes of lowered nerve tone.

Menstruation as a Cause of Colon Pain.

A good illustration of what I have just said is to be found in the influence of menstruation in eliciting or increasing colon pains. It is extremely common to find that these

pains are greatly aggravated at the menstrual period, and I have seen a few cases in which pain, undoubtedly of colon origin, occurred only at the time of the menstrual period, sometimes commencing a day or two before, and lasting a day or two after it. Cases of this nature would not, as a rule, come to a general physician, and I have no doubt that in many cases treated in the past for dysmenorrhoea, of the slighter degrees, the pain was in reality of colon origin. I also suspect that careful palpation would show that many cases in which there is pain and tenderness in the iliac fossa, greatly aggravated at the menstrual period and considered to be of ovarian origin, are in reality cases of mild mucous colitis or of simple bowel irritability such as I am speaking of. The fact that colon pains of this nature are usually also referred to the sacral region may aid in the deception, for pains in the back in the female are supposed to be a special prerogative of the gynaecologist. In this connexion I may perhaps quote an aphorism by one of our leading gynaecologists to the following effect:

"It is more important for the gynaecologist to remember that a woman has a colon than to remember that she possesses a uterus and ovaries."

Irritable Colon and Retroversion of the Uterus.

While speaking of the relationship of colon pain to gynaecology, I may also refer to the fact that the symptoms of retroversion or retroflexion of the uterus may be greatly aggravated by the presence of tenderness such as I have described in the upper part of the rectum. I have seen several cases in which severe pain on exertion, greatly aggravated at the menstrual period, was due to the pressure of the misplaced fundus uteri upon the tender bowel. We know that a retroverted uterus may cause few if any symptoms, but it is far otherwise if the bowel is at times exquisitely sensitive, owing to the presence of expansile tone in it. Some such cases I have in the past markedly relieved by medicinal and dietetic treatment alone, in ignorance of their true nature, and without having recourse to gynaecological aid, for it is only a few years since I first discovered the important part which a sensitive rectum can play in conjunction with uterine displacements. I am now more keenly alive to the presence of a gynaecological complication in these cases, just as possibly may be the case with some gynaecologists, who after what I have now said may realize the possibility of a medical complication in some of their more painful cases of uterine retroversion. I would here once again say that the presence of mucus or membranes in the stools is not at all essential in these cases, and often does not occur. The irritability may involve the muscular coat alone, and not the mucous membrane.

After what has just been said as to the increase of colon pain due to the nerve strain and nerve instability associated with menstruation, it will be quite easy to understand how powerful such a condition as nephroptosis may sometimes be in favouring the occurrence of pain in mucous colitis and irritable states of the colon in general.

Perhaps the best way of emphasizing what I have just been saying as to the part played by the different agencies in the production of colon pain is to give a concrete illustration.

For instance, a patient with a nephroptosis, which gives him very little trouble, gets overworked and run down, and then develops colitis with severe pain and mental depression, and gets into a neurasthenic condition.

There are three distinct ways in which this patient can be cured. The colon may be freed from irritability by appropriate diet and treatment, and the improvement in the general health which will result from the cessation of the pain and misery will restore the tone of the nervous system, and the kidney will not be able to cause any more disturbance than it did before the onset of the colitis. Or, again, the neurasthenic condition may be cured by Weir Mitchell or other treatment, and then the irritability of the colon nerves will be so far lessened that its spasmodic action will cease and the abdominal pain will disappear, and the nephroptosis will also cease to cause symptoms; or, thirdly, the kidney may be fixed up in place by surgical means (the abdominal tenderness would probably prevent the use of belt or truss), and with the removal of this cause of enhanced irritability of the nervous system the colitis and the neurasthenia will subside.

This, then, is a brief outline of a subject about which very much more might be written, and also in connexion with which very much more work remains to be done. I expect that in the near future we shall be able to distinguish different forms of catarrhal irritability of the colon, separating those of rheumatic or uric acid origin from those of influenzal origin, and both again from those due to intestinal micro-organisms.

A CASE OF INTUSSUSCEPTION ACCOMPANIED BY POLYPUS AND STRICTURE:

PERFORATION: RESECTION: RECOVERY.

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In the following case the history, taken together with the condition found, leads me to conclude that acute ensued upon chronic intussusception.

An unhealthy, neurotic, anaemic woman, aged 37, married, with five children, and living in a two-roomed house, had complained of indefinite abdominal pain for about six months. She often allowed her bowels to remain unopened for a week; her meals were most irregular, and she was in the habit of chewing quantities of raw rice and oatmeal. When seen from time to time she refused to allow any examination to be made.

History of Present Illness.

When seen she had severe abdominal pain, referred to the umbilicus, coming on in paroxysms, and inability to retain food. The bowels had not been opened for a week; there was no vomiting when no food was given; pulse 100; temperature normal. Nothing could be made out from the abdomen, and examination by rectum or vagina was refused.

Enemata were given every six hours for thirty-six hours; a mixture was also given. The enemata produced two actions; the patient gradually felt better, and nourishment could be given by the mouth.

On the fourth day she had another similar attack, which passed off in forty-eight hours. On the seventh day, in my absence, Dr. T. H. Redwood saw her; she said she was better. On the eighth evening I found she had been vomiting for twenty hours, and that for the last ten the vomit had been faecal. She was regurgitating mouthfuls of liquid faeces at short intervals. Pulse 140. It took another four hours to persuade her to submit to operation that night.

Operation.

After being admitted, she was given an enema, with no result; saline solution and adrenalin were infused hypodermically, and a nutrient enema with brandy was given also. Her general condition considerably improved, and the vomiting ceased; there was practically no distension, and nothing could be made out on abdominal examination. On rectal examination, a lump could be made out in Douglas's pouch; a catheter was passed; the stomach was not washed out, and a general anaesthetic was decided on; the pulse was 120. The anaesthetic used was C.E., which was taken very well. The abdomen was opened in the middle line from the umbilicus to the pubes. A little fluid escaped on opening the peritoneum; the gut was fairly empty. On putting the hand into Douglas's pouch, the lump was easily found, and proved to be an intussusception of the lower end of the ileum about 18 in. long, and a hard lump could be felt at its apex. With some difficulty, owing to the size of the apex, it was reduced, the abdominal cavity having been well shut off with gauze before commencing reduction. There were practically no adhesions, but two yellow spots and a perforation appeared on the receiving layer, and from this point on it was slightly adherent, and still more so at the apex, which was reduced with difficulty. Here there were two more yellow spots and two perforations on the receiving layer. A polypus could be felt inside the gut, which was markedly dimpled and thickened at the point of attachment. There was an annular stricture beyond the polypus and a great difference in the size of the gut on either side.

The patient's condition having improved, it was decided to resect and laterally anastomose the shut ends with Murphy's button (third size). This was done 3 in. beyond the stricture and 3 in. beyond the unhealthy spot mentioned. About 2 ft. of intestine was removed. More subcutaneous saline and a hypodermic of adrenalin were now given. The halves of the button were pressed together firmly enough for good coaptation of the opposing surfaces of gut wall, but on removing the clamps there was slight leakage in one spot; they were pressed more firmly together, and reinforcing sutures put in; this may account for the button coming away on the ninth day. A little fluid was found in Douglas's pouch. The abdomen was closed, and a large Keith's tube left in above the pubes, with a gauze wick. The preparation of operation area and operation took about an hour. The patient never vomited again from the time that she was put on the table until she was well. An injection of streptococcic and coli vaccine was given.

The wick was changed every six hours, and a good deal of fluid came away with no smell. More saline and adrenalin were

given, and she was kept up in Fowler's position. At the end of forty-eight hours there was some distension and pain, but no vomiting. Pulse 120; no flatus passed. A turpentine enema was given and not returned. A long tube was passed, and part of the enema came away, but no flatus, and distension was not relieved. Sodium sulphate 3vi in 3x iced water was given slowly, and liq. strych. hyd. (q.q.h.) hypodermically. Liquid faeces were passed, and from that time the patient made a good recovery, having about four actions daily, the discharge from the tube ceasing about the ninth day, on which day the button came away. The patient for the first eight days in her own house had been on a hard kitchen armchair, with her legs up day and night; she had refused to move out of it. She developed a large sore in consequence over her sacrum, which is now rapidly filling up.

On opening the gut removed, the polypus, as big as a large prune, was found to be gangrenous; a section through the base of it, cut and stained here by Dr. Scudamore, seemed to be a columnar-celled carcinoma. The only gland seen when removing a V-shaped piece of mesentery looked healthy.

The point that strikes me about the case is that this woman is about the last in the district I should have expected to stand an illness of this sort—unless her previous state in some degree could have hardened her to the condition of things found at the operation.

IMPACTION OF GALL STONE IN SMALL INTESTINE: LAPAROTOMY: RECOVERY.

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The following case is of interest, not only on account of its rarity, but because the symptoms were so slight and insidious, and there was an entire absence of any previous history of hepatic colic or pain. The recovery after so long a period of complete obstruction before relief was given is noteworthy. The septic middle-ear abscesses were presumably caused by the faecal vomiting.

I was summoned to Mrs. L. B. on the evening of November 23rd, 1908, who was said to be suffering from colic. She was a very stout woman and was sitting by the kitchen fire and not showing any marked symptoms of distress. She complained of intermittent pain about the umbilical region with nausea and vomiting.

History.

She stated she was aged 65, and married, but with no children. She had always enjoyed good health, and till early that morning was in her usual health, taking food well; the bowels acted regularly as a rule, but had only moved slightly on the evening of November 21st. Soon afterwards slight intermittent griping pain set in, but did not become severe until the early morning of November 23rd; this, however, was not so acute as to prevent her attending to her household duties until I saw her in the evening.

The patient being fully dressed, I had not an opportunity of examining the abdomen, nor did I think the symptoms urgent enough to require it. I treated the case on the usual lines, prescribing calomel, 5 grains, and bismuth and soda for the sickness.

Next morning I found her in bed and the symptoms much the same, tongue clean, temperature and pulse normal, but no action of the bowels had taken place. There was nothing to indicate the cause, and, regarding it as possibly faecal obstruction, I ordered copious enemata, but with scarcely any result.

As the symptoms did not assume great urgency, that evening I gave her more calomel, to be followed by a brine enema in the morning, but by that time the abdominal pain became more violent and the vomiting distinctly faecal. I asked my colleague, Dr. Box, to see her with me, and we agreed that some form of intestinal obstruction, needing surgical interference, was present, and she was admitted into the hospital.

She absolutely refused to have anything done in the way of operation. The symptoms got more and more urgent, till the patient was in *extremis*. By the seventh day of the obstruction the distress became so great that she voluntarily asked me to try and do something to relieve her.

On the afternoon of November 28th, I opened the abdomen in the middle line, and on passing my hand over the intestines found the cause of the obstruction in the small intestine about 18 in. above the ileo-caecal valve. After withdrawing the bowel and clamping it above and below, I surrounded it and the wound with sterilized swabs, turned the intestine back over the end of the stone, and incised the bowel enough to push the stone through the opening endwise. I sewed up the wound with a double row of silk sutures, first continuous, second interrupted (Lembert). After washing the parts with weak iodo solution and then saline, the bowel was returned and the abdominal wound sutured in the usual way.

Her recovery was slow, owing partly to the delay in operating. An abscess formed in the wound, and subsequently she had double ear abscess.

The stone was cone-shaped, and represented a cast of the gall bladder, measuring in its long axis 2½ in., and in the transverse diameter 1½ in.