open. Thus, having found by means of the x rays that a young man who had been in the habit of taking large doses of vegetable and saline purgatives every day was really not constipated at all when he was taking no medicine, I was able to persuade him on two consecutive mornings to open his bowels without artificial help, after demonstrating to him that the faeces had passed through his intestines, and were simply waiting in his rectum to be expelled.

The results of operation on the alimentary canal can be investigated with the x rays. My observations have convinced me that gastro-enterostomy is always a drainage operation, and that in successful cases most of the food leaves the stomach through the stoma whether pyloric obstruction is present or not. For this reason the anastomosis should always be made in the pyloric end of the stomach even if the ulcer is near the cardiac orifice. When the operation is unsuccessful it is generally due to the alteration which occurs in the relative position of the parts concerned when the vertical position is assumed; this is least marked with a hypertonic stomach, a fact which explains the rarity of vomiting and other unpleasant symptoms after the operation in cases of duodenal ulcer. I have now seen a number of patients on whom a gastro-enterostomy had been performed for various reasons, who, though cured of their original complaint, were much troubled during and immediately after meals by a feeling of fullness just above the umbilicus,

Fig. 23.—Failure of abdominal support to keep transverse colon, which had dropped into the true pelvis, in normal position in the erect posture.

Fig. 24.—Five years after gastro-enterostomy for small duodenal ulcer which did not produce obstruction.

and who in some cases also suffered from diarrhoea after taking food. In these cases the food runs with such rapidity out of the stomach into the jejunum that none accumulates in the former, but the latter is over-distended; this overdistension is doubtless the cause of the discomfort (Fig. 24). Relief is obtained if the patient eats with extreme slowness, especially if the ordinary meals are replaced by smaller and more frequent ones; at the same time the diarrhoea can generally be controlled by the administration of a preparation of pancreatic ferments, which helps digestion in the intestine to compensate for the absence of digestion in the stomach, and also to a certain extent makes good the deficiency of pancreatic juice which results from the absence of the normal stimuli to its secretion.

I have covered such an extensive field in these remarks that I have only been able to give some slight indication of the most important results which have followed the employment of the x rays as a method of investigating the physiology and pathology of the alimentary canal. But I hope I have succeeded in awakening your interest in this fascinating subject, and showing you what great advances have already been made in our knowledge in the five years which have elapsed since Rieder showed that it was possible to apply the methods previously used by Cannon on cats to human physiology and pathology.

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THE authorities of the United States navy have followed the example of the army by making antityphoid inoculation compulsory in the case of all officers and enlisted men under the age of 45. Henceforward all recruits enlisted will have to submit to vaccination against typhoid fever as they now do against small-pox.

THE IMPORTANCE OF PELVIC DEPOSITS IN THE DIAGNOSIS OF ABDOMINAL CANCER.

BY

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In a certain proportion of cases of carcinoma in the upper abdomen, portions of the growth find their way into the general peritoneal cavity, and then into the pelvis, where they become implanted and grow, in many cases giving rise to a mass easily palpable per rectum. Whether the particles simply gravitate to the pelvis, or arrive there as the result of the natural drainage of peritoneal fluid assisted by intestinal movements, or are carried in some other way, is of no moment for my present purpose.

The masses are to be felt in the recto-vesical pouch or pouch of Douglas, on the anterior wall of the bowel,

within three or four inches of the anus. They may be single or multiple, and are either detected as a definite fixed nodule or nodules or as an infiltration. As a rule they feel about the size of a small hazel nut, though they may be much larger. In my cases the presence of the deposits has not given rise to any symptoms whatever, and they have only been discovered in the course of routine examination. Cases, however, have been recorded¹ in which the growth apparently originated in the rectum. Should this question arise, the matter could readily be cleared up by sigmoidoscopic examination. In cases of malignant disease in the upper abdomen, and especially with stomach cancer, while there may be no signs of dissemination to be made out on ordinary abdominal examination and no ascites, there may be quite a considerable deposit in the pelvis, easily recognizable on rectal examination and without any symptoms to point to its presence.

The first case which came before my notice was mentioned by me in an address delivered before a meeting of the British Medical Association at Sunderland² on April 3rd, 1906, as follows:

The Importance of Rectal Examination.

In my hospital work nothing has struck me more than the neglect of this method, for seldom a month passes without my seeing cases of serious rectal mischief that have been overlooked or wrongly interpreted for the want of proper local examination. It is indispensable in a complete examination of the peritoneal cavity, for it is only by this route in the male that the recto-vesical pouch can be properly explored. I am familiar with no better instance of its value in this connexion than the circumstances of the following case.

Fig. 1.—Represents diagrammatically a vertical section of the peritoneal cavity. The arrows show the directions in which a stomach growth may spread. The mass in the recto-vesical pouch is a peritoneal deposit of growth.

In May, 1900, Loreta's operation was performed for pyloric stenosis at another hospital. In October, 1900, the patient was admitted to the Newcastle Infirmary, where pylorotomy for cancer was carried out by Mr. Morison. In June, 1903, the man returned to the hospital for the removal of a tiny recurrence in the scar. Once again, in July, 1904, the patient applied for relief, suffering from a mass of growth in the abdominal scar. He was otherwise in good health, was able to work as a labourer, and had no stomach or bowel symptoms. It was arranged to remove the growth, but, as part of a regular routine, the zealous house-surgeon examined the rectum only to discover a large mass of growth in the recto-vesical pouch. Operative interference was, of course, hopeless; the patient was saved the pain and inconvenience of a useless operation, and the surgeon spared the chagrin of performing one. The patient sank and died in November, 1904, without developing any signs of obstruction.

Again, in a paper before the Blyth Division of the British Medical Association, March 6th, 1908, on "What can be done for Cancer of the Stomach," I drew attention to the matter as follows:

Recognition of Hopeless Cases.

Now, cases in which the abdomen contains fluid are usually beyond surgical aid, for it means involvement of the peritoneum by growth. But there are many in which there is extensive peritoneal involvement and yet no fluid, and, in a fair proportion of these, deposits can be felt in the pouch of Douglas. This sign has often been a great help to me, not only for the purpose of diagnosis, but because it shows that the patient's lease of life is rapidly running out and that a radical operation can scarcely be of any avail.

Fig. 3 [Fig. 1 in present article] shows roughly the peritoneal cavity in vertical section, with the directions in which a malignant stomach growth may spread indicated by the arrows. Once the epithelium of the growth has burst through the overlying peritoneum it is spread by the influence of gravity, intestinal movements, and the conduction of the fluid which its growth produces. As many of these patients go about in the early stages the particles gravitate into the pelvis, where, without causing any symptoms whatever, they give rise to other deposits, which may form quite a large mass easily felt by the finger in the rectum or vagina.

For instance, in a recent case, a man of 51 was sent up to me for operation. He had been ill for four months, and, owing to frequent vomiting, had become wretchedly thin and ill. There was a large, freely movable mass in the situation of the pylorus. When the patient lay on the left side the tumour moved over to that part of the abdomen, and vice versa. Except for the wretched general condition it was apparently an excellent case for radical operation, as there were no signs of dissemination whatever, but, on rectal examination, some hard nodular masses could easily be felt on the pelvic peritoneum. I performed gastro-enterostomy, and, at the operation, the local stomach conditions were found to be very well suited for a secondary gastrectomy, but the pelvic deposits which I had previously felt were abundantly verified on exploring the pelvis with the hand.

Sometimes the pelvic deposit is the first thing to suggest a diagnosis of stomach cancer, as in the following case:

A lady of 43 was sent to me as a probable case of malignant uterus. On making an examination the uterus appeared to be

normal, but there was a definite hard mass in the pouch of Douglas. On going into her history I found there had been much indigestion with vomiting, and she subsequently turned out to have stomach cancer with secondary peritoneal deposits.

Of course, it must be distinctly understood that this sign is of no negative value whatever, for the peritoneum may be studded with small deposits which it is quite impossible to feel on rectal or vaginal examination; and, further, care must be taken not to be misled by an old inflammatory mass in the pelvis, or by faeces in a prolapsed pelvic colon.

Since then I have frequently observed this sign, and its recognition has been of the greatest service, as the following illustrative cases will show:

CASE I.

M. P., a man aged 45, was admitted to hospital with a history of indigestion of five months' duration. He had pain about an hour after each meal, with frequent vomiting and loss of flesh and strength. When seen he was emaciated, and there was a large movable, nodular mass in the situation of the pylorus, but with no evidence of gross dilatation of the stomach. There were no other masses in the belly, no free fluid, no enlargement of the liver, and no big glands above the left clavicle, but on rectal examination a hard mass was easily felt in the recto-vesical pouch. The patient died suddenly after gastro-enterostomy, and at the necropsy deposits were found in the pelvis as shown in the illustration (Fig. 2). The primary growth was large, and the omentum and peritoneum were invaded, but there were no deposits in the liver.

CASE II.

In January, 1910, I was asked to see a woman, aged 38, who had suffered from indigestion from May, 1909. She saw her own doctor in September of that year,

and was better after treatment. By December the symptoms recurred and she was seen by a physician, who sent her to bed. Soon after this a lump was discovered in the epigastrium, and I was asked to see the patient with regard to its nature. The lump would do very well for a growth at the pylorus, but it was only on rectal examination that the discovery of a hard mass at once clinched the diagnosis and showed how far the growth had insidiously progressed. I performed gastro-enterostomy in January, 1910, which gave me the opportunity of confirming the findings, but the patient soon sank and died four months later.

CASE III.

The most recent case was that of a man, aged 68, who was admitted to hospital in November, 1910, with a gall-stone history of twenty years' duration. At the operation the common duct was very large and full of stones, while the gall bladder, which was removed, was shrivelled and very thick-walled. On microscopic examination it showed evidences of a slow-growing carcinoma. In November, 1911, this patient was readmitted, looking better than before but complaining of pain and discomfort after meals, accompanied by vomiting. On examination a large hard mass was felt adherent to the centre of the scar. There were no other masses, no evidence of enlargement of the liver, and no ascites; but on rectal examination a firm, hard, fixed mass was at once felt on the right side, with several smaller fixed nodules to the left. It was decided to open the abdomen with the object of relieving the obstructive vomiting from which the patient suffered. It was

Fig. 2.—Drawing of the parts from the case of M. P. described in the text. It represents a vertical section of the pelvic peritoneum, and shows deposits of growth in the recto-vesical pouch. They were easily felt from the rectum as hard, fixed nodules.

Diagram explanatory of Fig. 2.

then found that the hypochondriac mass originated in the gall-bladder area and directly involved the duodenum, while there were many peritoneal deposits which were thickly crowded in the pelvis.

Cases like these show the absolute need of routine rectal examination, and are eloquent testimony to the very valuable evidence that may be so gained.

I have no personal statistics as to the proportion of cases in which this sign is present, but Dudley W. Palmer⁴ has investigated a consecutive series, and I quote from his paper as follows:

In the 435 case histories were 307 cases of carcinoma of the stomach, the remainder being of the intestine, pancreas, liver, and gall bladder. In this number 28 (or 6½ per cent.) showed secondary deposits on the rectal shelf or in the cul-de-sac of Douglas. No secondary deposits were to be palpated through the abdomen, and, with two exceptions, abdominal fluid was clinically questionable or absent.

The discovery of such pelvic deposits may not only establish the diagnosis of malignant disease, but may at the same time be the earliest clinical sign of inoperability, so far as radical measures are concerned.

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FURTHER EXAMPLES ILLUSTRATING CASES OF CHRONIC TOXAEMIAS AT VITTEL.

BY

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IN July, 1910, I was able to bring forward a series of typical cases from my practice at Vittel during the previous season (1909). That paper led to a number of inquiries from many medical brethren, most of whom asked for more. Some varieties of chronic toxaemias were not represented, and I have tried in the present notes to, in part, fill up these gaps.

In practice at such a place one finds a large number of cases of a nondescript character, or at least appearing to be so to our imperfect knowledge or our insufficient means of determining in detail the loss of physiological balance or, in other words, the disease, which makes them appear to us as an unco-ordinated group of symptoms. Such indefinable cases represent a large part of one's practice; they do the cure, get relief of their symptoms, and go on their way contented. I do not feel justified in quoting such cases, as they would rather tend to confuse our minds than to push our observations and deductions onward along the path of precise knowledge.

I have therefore limited these new examples of cases, with one exception, to definite morbid entities, to illustrate one or the other ailment that is dignified by a name and presumed to be of known pathology. Like those of the first series, their treatment is based fundamentally upon two principles, which may be defined as:

- (1) The use of a vehicular water.
- (2) The compensatory relief of the usual work to the kidneys, allowing them to do an equivalent of new work.

1. The first is the employment of a natural saline solution, just suitable, a little hypotonic to the blood, characterized physiologically by rapid assimilation, and, if the supply is kept up, by equally rapid excretion. So intense is the affinity of the blood for this water that when large quantities are being drunk a tendency to constipation is produced, showing that the blood is even stealing it from the food bolus, and also showing, not infrequently, marked thirst for more by patients drinking considerable quantities daily.

2. The second fundamental principle is compensatory relief of the kidneys. If a given horse can draw a load of two tons of coal, that horse will not be able to draw an additional ton of potatoes. If we take off a ton of coals, we can then replace that amount by a ton of potatoes. This principle is the one we follow in utilizing a non-

chloride-bearing water, such as Vittel. If by a suitable diet we reduce the diurnal amount of sodium chloride, which we will put at 12 grams, to a practically accessible amount of 6 grams, we give our cellular structures a chance of giving up to the partly demineralized blood serum their store of uric acid and other toxic substances. At the same time our kidneys have a reserve energy for excreting their uric acid and other toxic substances to the equivalent of the diminished 6 grams of sodium chloride. This analogy will, I hope, make clear the mechanism of the lixiviating effects of such a mineral water as Vittel.

CASE I.

Mrs. C., aged 49. Blood pressure 140 mm.; capillary reflux 3; pulse 58; weight 72.200 kilos. When young had lung trouble, but has been gouty for three or four years, which, she says, is markedly hereditary. Last Christmas, after exercise, had dark water and a little pain, followed by rigors and giddiness, and finally renal colic. Shortly afterwards the stones dropped into the bladder under the influence of Vittel "Grande Source," which had been ordered her. In a few days she passed two small uric acid stones.

She is a "good eater," but temperate in alcohol; her digestion is good, excepting for a little flatulence; has been constipated for some time, and has a thoroughly inactive skin. She has a fair sleep, but is a great dreamer, and has a bad mouth in the morning.

CASE I.—Mrs. C. August 13th, 1910: Specific gravity 1015. Faint traces of biliary pigments, indican, and scatol. Purins 0.842. Extremely numerous pavement cells, some leucocytes, and very small crystals of uric acid. September 5th, 1910: Specific gravity 1027.5. Faint traces of true bile pigments, indican, and scatol. Purins 0.251. No deposits. V, Volume; S, solids; A, acidity; U, urea; U.A., uric acid; C, chlorides; P.A., phosphoric acid.

She came to Vittel feeling generally "down" or "seedy." The first urine analysis portrays the reason of this, as well as some remaining catarrh of the urinary passages. The urea-uric acid ratio is much disturbed. In addition to six glasses of "Source Salée" in the morning, and three of "Grande Source" in the afternoon, she had massage under water every fourth day, and daily general massage with Pelciba iodine jelly. The unpleasant feeling soon disappeared. At the end of the cure all the elements of the urine are raised in quantity, showing that both nutrition and elimination have been improved. Blood pressure fell to 125 mm.; weight had fallen to 69.750 kilos, or a loss of 2.450 kilos (5½ lb.).

I have given this case as one where the principal symptoms indicate that they were due to water starvation, with resulting toxaemia and deposition of uric acid in joints and urinary passages and fat in the tissues. Outside this, I think we can argue very little from the analyses, and this is a good example of clinical success but speculative failure.

CASE II.

Dr. H., aged 48. Blood pressure 135; capillary reflux 2½; pulse 60; weight 64.650 kilos. Has always suffered from irritability of the bowels, with constipation and occasional diarrhoea. Spasmodic calls and mucous diarrhoea very slight. His digestion is good, he does not suffer from headaches, but always dreams. He is obviously neurotic.

He came to Vittel because he suffers from tendinous fibrosis, which attacks any group of muscles that are put to any new or special use. He exhibits large nodes on tendon sheaths at wrist, etc.

The first urine analysis shows an excess of solids due to too much chlorides, acidity a little raised, urea normal, but marked retention of uric acid, so that the ratio of urea to uric acid is much disturbed with imperfect phosphatic assimilation.

He was ordered a relatively low chloride bearing diet, as free as possible from rich, xantho-uric-bearing foods, six glasses of "Source Salée" every morning, and three glasses of "Grande Source" in the afternoon, every alternate day a vapour bath and massage under water, to be followed by a rub down with Vigorax. Unfortunately, he was unable to afford but a little over a fortnight for the cure, notwithstanding which he declared