pushed. It must also be borne in mind because in cases of suspected rupture of a gastric ulcer the absence of a liver dullness cannot, as is now well recognized, be relied on as an indication of free gas in the peritoneal cavity.

In heart disease also the level of the diaphragm is a useful guide as to the condition of the circulation. If the weakness of the heart muscle be the prime factor, we shall expect a high diaphragm, unless, as in advanced age, the tissues be too rigid to yield easily; if, on the other hand, some obstruction to the circulation, such as valvular defect, be the chief cause of failure, there will be excess of blood in the veins of the thorax, and a normal or a low diaphragm would be found.

Thus we have in the height of the diaphragm, as shown by the upper level of the gastric resonance, an indication for treatment and a help in the diagnosis and prognosis of disease, with which we can ill afford to dispense.

CASE IV.—*Gastric Ulcer.*

Kate G., aged 38, admitted to hospital March 6th, 1906 (Figs. 4, 5, 6, 7, 8, and 9). There was a history of dyspepsia of many years' standing, and an attack of haematemesis six years ago. Present illness dates back to an attack of influenza three weeks ago; ten days ago an attack of vomiting was followed four days later by haematemesis, half a pint of blood being brought up.

On admission, much pallor. Pain after food and epigastric tenderness were noted. Examination of the abdomen showed that the diaphragm was rather high, the gastric resonance reaching up to the upper border of the sixth rib, and the lower border of the liver being $1\frac{1}{2}$ in. above the costal arch. There was $1\frac{1}{2}$ in. of relative liver dullness in the right nipple line. She was fed entirely by the rectum for a week, and then the food was gradually increased.

The rise of the diaphragm, and its return to normal, are well shown in figures No. 4, 5, 6, 7, 8, 9, and also in the table given. With regard to Fig. 8, the transient dilatation upwards of the heart is of the type usually seen in anaemia.

CASE V.—*Gastric Ulcer with Severe Loss of Blood.*

Nelly Y., aged 20, admitted January 18th, was kept on nutrient enemata only till January 20th, then allowed one pint of milk a day as well. This diet was increased gradually till by February 10th she was taking a full fish diet.

The stomach resonance and the liver dullness (Figs. 10 to 12) continued to rise till January 29th, when they stood at the upper border of the fifth left and fourth right ribs respectively. At this date she had been for two days on an ordinary bread and milk diet. By February 10th there was still some elevation of the diaphragm, but the relationships of the organs were more normal.

CASE VI.—*Haematemesis.*

Louisa C., aged 33, admitted with very severe haematemesis. She was so blanched that the foot of her bed had to be kept elevated to prevent faintness.

The figure (13) shows the marked rise in the level of the gastric resonance, and of the lower edge of the liver; also the broadening of the relative liver dullness. In this case there was full intestinal resonance for 2 in. above the costal arch in the right nipple line.

CASE VII.—*Severe Anaemia.*

Cissy G., aged 31. The gastric resonance reached well into the fourth left interspace, and in the fifth interspace there was well-marked gastric resonance throughout the whole interspace from the sternum to the anterior axillary line (Fig. 14). The heart was displaced upwards, and, owing to the anaemic dilatation of the right ventricle, there was a larger area of dullness than in the cases of gastric ulcer without marked anaemia. There was some cardiac impulse in the fourth interspace, but the maximum impulse was in the third left interspace external to the nipple line (3 in. from the sternum). In the second left interspace there was relative dullness and pulsation for 2 in. from the sternum.

CASE VIII.—*Anaemia.*

Ada F., aged 17. Admitted to hospital February 15th with anaemia and severe chilblains. On admission the area of cardiac dullness was small, there being no absolute dullness, and the gastric resonance was very high—namely, up to the middle of the fourth rib in the left nipple line. There was also a great increase towards the axilla, for gastric resonance and reverberation were clearly obtainable in the fourth interspace near to the mid axillary line (Fig. 15). In the course of ten days the diaphragm was lower, the gastric resonance reaching only to the fifth rib, and only extending into the axilla in the sixth and seventh interspaces. After being in hospital six weeks the stomach, though still up to the fifth rib, did not reach into the axilla at all, and the cardiac dullness was larger, showing some anaemic dilatation.

CASE XI.—*Rheumatic Pericarditis.*

Emily E., aged 15, was admitted on October 29th, very ill with rheumatism and pericarditis.

The diaphragm was very high, the gastric resonance reaching to the fourth rib, and the relative dullness of the liver was

at the third rib in the right nipple line. The lower edge of the liver only reached to the lower border of the sixth rib. Three weeks later, on November 20th, the condition had improved, but the diaphragm was still high, as shown in Fig. 19. Within another three weeks the diaphragm was nearly back to its normal level (see Fig. 20).

There was very considerable dilatation of the right ventricle upwards to the left in this case.

THE POSSIBILITY OF ACTINOMYCOTIC INFECTION BY THE VAGINA.

By H. E. SYMES THOMPSON, M.A., M.D. CANTAB.,
M.R.C.P. LOND.,

PHYSICIAN, GREAT NORTHERN CENTRAL HOSPITAL; ASSISTANT
PHYSICIAN, ROYAL HOSPITAL FOR DISEASES OF THE CHEST.

IN the course of a study of actinomycosis in man Ruhrah¹ classified 628 cases according to the original sites of infection. His series included 132 abdominal cases, all of which he considered had been infected from the digestive tract. He gives no instance of primary vaginal infection. If a doubtful case published by Zemann² is excluded, I have discovered two cases of this nature in the literature. They were published respectively by Grainger Stewart and Muir,³ and by Giordano.⁴

I. J., single, a kitchen maid, was admitted to St. George's Hospital on October 24th, 1904.

History.

She was recovering from an illness characterized by acute abdominal pain, nausea, vomiting, constipation, and painful micturition which dated back nine days. There was a history of two similar attacks seventeen months and eleven months previously which confined her to bed for three weeks on each occasion. Dysmenorrhoea had been present for two months before admission, otherwise the menses had been normal. She had been somewhat anaemic for the previous four years. The family history was good.

Condition on Admission.

The patient was well nourished, her tongue suggested dyspepsia, and tenderness was present on deep palpation in the right iliac region. A mass was felt in the pelvis on bimanual examination. There was no vaginal discharge. The thorax and the urine presented no abnormality.

After-history.

On November 3rd the uterine appendages were removed. There was a right pyosalpinx, and the left ovary had become a bag of pus. The appendix, which showed signs of old inflammation only, was also excised. The patient was relieved by the operation, notwithstanding a persistent faecal discharge, and she went to a convalescent home on December 9th. Here she began to complain of pain on the right side, and the temperature rose to 103°. On January 17th the abdomen was explored without result. On January 31st it was noticed that there was a fluctuating swelling over the right lower ribs. This was incised, and a pint and a half of pus, coming apparently from a liver abscess, was evacuated. Subsequently a rib was resected over the liver, and the wound, which had become oedematous, was scraped. An abscess, which pointed 2 in. higher up, and which contained 2 oz. of pus, was also opened, and the discharge from the wound over the liver became faecal. The patient lived till June 14th, gangrene of the right leg being the immediate cause of death.

Necropsy.

I found chronic peritonitis in the pelvis and in the hypogastric region. The caecum and ascending colon formed part of the posterior abdominal wall, having their anterior surfaces only in relation to the peritoneum. Several abscesses were found in the muscles and fasciae on the right side. There was a somewhat diffuse retrocaecal abscess and an abscess the size of a large marble 1 in. above the iliac crest. The ilium was smooth, and no connexion could be traced between the bone and the lower abscess, or between one abscess and the other. A third abscess was found between the posterior surface of the right lobe of the liver and the diaphragm, reaching as far down as the suprarenal gland. It contained inspissated pus, and the contiguous surface of the liver was eroded. There was a burrowing hepatic abscess the size of a large orange close to the surface of the liver and to the last-mentioned abscess. It was made up of a large number of small cavities which gave it a fenestrated appearance on section, and a resemblance to a sponge containing pus. The liver was enlarged and fatty, and it weighed 5 lb. 10 oz. The spleen was large and soft, and the kidneys were cloudy. The mesenteric glands were enlarged and caseous. The organs showed no waxy change to the iodine test. The alimentary canal was normal except in the caecal region. The pleurae were normal. The right lower extremity was gangrenous, and there was a clot in the common femoral vein.

Dr. R. S. Trevor, who suggested the actinomycotic origin of the lesions, carried out the following investigations:

Some pus from the liver was stained by Gram's method and in eosin, and numerous typical actinomycetes with interlacing filaments were found. Sections taken from the liver substance in the neighbourhood of the abscess were also stained with a similar result. The pelvic organs had been kept since the operation, and an examination of the pus in the left ovary demonstrated many streptotrichiae. The substance of the organ, however, yielded no organisms although it was thoroughly searched. The right ovary and the tubes were also examined with a negative result.

Did infection take place through the vagina or by way of the intestinal mucosa? The following points may be mentioned in favour of the vaginal route: At the first operation the uterine appendages were much disorganized, and beyond the results of old appendicitis of uncertain date no evidence of disease was found in other parts of the abdomen. The three attacks of illness would, therefore, appear to be referable to the pelvic organs and the retrocaecal abscess to be of more recent development. This theory as to the direction of spread of the disease is borne out by the subsequent history of the case, for in the later stages the advance was in an upward direction. On the other hand, infection from the intestine is of far more frequent occurrence; and the discovery of a retrocaecal abscess at the necropsy, and the fact that the right side of the abdomen was involved, are further points in favour of this method of infection.

I am indebted to the kindness of Mr. G. R. Turner, Dr. A. F. Stabb, Mr. F. Jaffrey, and Mr. T. C. English for permission to publish the case.

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A PLEA FOR THE USE OF OATMEAL IN THE DIETARY OF CHILDREN.

By CHALMERS WATSON, M.D., F.R.C.P.E.,
EDINBURGH.

THERE is ample clinical evidence that a dietary into which oatmeal largely enters is one which is specially valuable for the growth and nutrition of children. In former days the diet of the people in many districts of Scotland included oatmeal as one of the staple ingredients, and, as is well known, this régime produced a big-boned and well-developed race. This being so, it is reasonable to think that there may be some ingredients in an oatmeal diet that have a favourable influence on one or more glands whose functional activity is of special importance during the growing period—for example, the thyroid gland. Some facts in favour of the correctness of this hypothesis have recently been ascertained,* as follows:

Six young rats about 6 weeks old were fed for four to eight weeks on a diet of uncooked oatmeal and water, an equal number of controls being fed on a bread and milk diet. At the *post-mortem* examination the most striking feature was the thyroid gland in the oatmeal-fed animals. This gland was markedly enlarged in the oatmeal-fed rats, the average percentage weight being 0.078 gram, as against 0.029 gram in the controls. Histologically the glands of the oatmeal-fed rats showed evidence of greatly-increased functional activity (see Fig. 2), with in two instances a swollen and detached condition of the secreting cells.

In a second series of 6 young rats which were fed on an exclusive porridge diet, the porridge being made with skim milk, a similar result was obtained.

These results appear to indicate that an excessive oatmeal diet has a markedly stimulating effect on the thyroid gland of young animals, and there seems no reason to doubt that a more moderate and more physiological use of the same food would be followed by a stimulation in a degree which would be wholly beneficial. It appears to me that we may find in these facts the explanation of the value of oatmeal in the dietary of young children, the results furnishing the scientific explanation, in whole or in part, of the well-established clinical fact that porridge is an excellent food for children. In accordance

with the teaching of these results we should no longer regard oatmeal water as a mere diluent or as a convenient form in which starch may first be administered to an infant (Holt), but as a foodstuff of very special value for the growing child.

This brings me to a brief consideration of the practical aspects of the subject, my remarks being restricted to the use of oatmeal in children from the third year onwards. Breakfast is the meal into which oatmeal should most

Fig. 1.—The normal appearance of the thyroid gland of a rat fed on the ordinary laboratory diet—bread and milk in known proportions. $\times 50$.

largely enter, the best form of administration being porridge and milk, which should be followed by a glass of milk and some bread and butter. It is not, in my opinion, advisable to supplement the meal by meat in any form, for two reasons: First, because it is not necessary and may be harmful; and, secondly, because the use of the meat tends to create a distaste for the more wholesome but less appetizing meal of porridge. If a child be given for its breakfast a little porridge, followed by bacon, it is

Fig. 2.—Thyroid gland of a rat of same age as Fig. 1, after being fed for six weeks on an oatmeal diet. The gland is enlarged, the colloid being increased in amount and staining more deeply.

certain that in 9 out of 10 cases, or an even greater proportion, the chief element in the repast, from the child's point of view, is the bacon. In this respect children are just like young animals. In an extensive experience of feeding rodents on different diets I have never seen a young rat which would look at porridge or bread and milk if meat was available. We must, however, recognize two important reservations to this general recommendation of a porridge breakfast for children. In the first place, a porridge diet, *per se*, is not good for

* This investigation was carried out in the Physiological Laboratory of Edinburgh University, the expenses being defrayed by grants from the Moray Fund and from the Carnegie Trust.