sunken, looking very toxic and slightly jaundiced, abdomen not moving with respiration and legs drawn up. No passage of flatus for thirty-six hours, small quantities of high-coloured urine passed with difficulty. Maximum tenderness in right lower abdominal quadrant; a tender mass could be felt per rectum on the right side, and the recto-vesical pouch felt full. Pulse 110, thready; temperature 102.8°.

Laparotomy performed through right rectus. A gangrenous perforated appendix which was hanging into the pelvis was removed. The pelvis was full of a very offensive fluid and a concretion was found free in the fluid. Diffuse peritonitis was well established; the intestine was acutely inflamed and distended; large patches of lymph were present on the small intestine, whose coils were matted together. The pelvis was mopped dry, but the remainder of the peritoneal cavity was not touched. A small drain was left for forty-eight hours down to the bottom of the recto-vesical pouch. The abdomen was closed in three layers.

Subsequent History.—Biliary vomiting continued for three days. No passage of flatus until the third night. A very offensive liquid stool passed naturally on the fourth day. The patient developed bronchopneumonia, but the abdominal condition remained satisfactory. Distension had entirely gone at the end of the eighth day. Tube removed at the end of forty-eight hours. Despite the pneumonia the patient made a very satisfactory recovery.

Treatment.—Continuous subcutaneous saline up to the third day, copious drinks of water containing bicarbonate and citrate, glucose per rectum. Morphine gr. $\frac{1}{8}$ hourly, atropine gr. $\frac{1}{16}$ 12-hourly for forty-eight hours, and discontinued after the end of the third day. No aperient until the ninth day. Very light diet up to the ninth day, when diet was gradually increased.

SUMMARY OF CASES.

Briefly the series of twenty-one cases is as follows:

The cause of the condition was due to appendix abscess in 6, perforated gastric ulcer in 1, penetrating wounds of the abdomen in 8, intestinal obstruction with gangrene of the gut in 3, intestinal obstruction with perforation of the gut in 1, pneumococcal in 2.

There was one death—a case of intestinal obstruction with gangrene of the gut. Most noticeable in this case was the absence of any healthy reaction of the peritoneum; clinically it was a very severe example of general toxæmia.

The two cases of pneumococcal peritonitis both showed symptoms of subacute intestinal obstruction. Median laparotomy was performed and the obstruction freed.

One case of appendicitis and two of penetrating abdominal wounds were associated with coffee-ground vomiting. One case of appendicitis and one of a gunshot wound developed intestinal obstruction requiring further operation. In both there was a healthy peritoneal reaction in the form of plastic adhesions and fluid, and both survived the necessary operation. One case (appendix) developed a faecal fistula which subsequently closed.

In only one of the cases was the peritoneal fluid frankly purulent, and in all but this one lymph and plastic adhesions were present. In no case was an attempt made to drain or wash the peritoneal cavity; nothing was disturbed beyond the necessary area of operation. No case proceeded to the formation of localized abscesses in the peritoneal cavity.

All (with the exception of the one death) ran almost identically the same course, in that vomiting ceased on the fourth or fifth day, and flatus was passed about this period. Distension subsided in all by the end of the tenth day; in some cases it was earlier.

The urinary outflow (a very important factor) at first diminished, increased rapidly after forty-eight hours, and with this was noticed a change in the character of the vomit and improvement in the patient's general condition.

Treatment in all cases was identical, and has already been detailed in the text. All the patients were nursed in a very slightly elevated position with a bolster placed beneath the knees.

DR. WILLIAM H. WELCH has presented to the College of Physicians of Philadelphia the first account of vaccination published in the United States. The author was Benjamin Waterhouse, the first professor of the theory and practice of medicine in the University of Harvard. He states that he had received the virus from England, and forthwith vaccinated his own children. To prove that immunity had been established he afterwards took the children to the Boston small-pox hospital, where they were inoculated with small-pox virus taken directly from a patient in the hospital. Finding that no effect followed the procedure, Waterhouse exclaimed, "One such fact is worth a thousand arguments."

FIFTEEN CASES OF LIVER ABSCESS:

AN ANALYSIS OF SYMPTOMS AND TREATMENT.

BY

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THE reports of the Medical Research Committee on the prevalence of infection with the *Entamoeba histolytica* or its cysts, not only among troops returning from Mesopotamia and the Eastern Mediterranean, but also among members of the civilian population who have never been out of England, will increase the interest taken in the complications traceable to this parasite.

Of 450 non-dysenteric soldiers in the Liverpool Tropical Hospital, Professor Warrington Yorke found that 7.8 per cent. were infected. MacAdam and Keelan, after examining over 2,000 men at Deolali, India, estimated that at least 33 per cent. of the troops returning from Mesopotamia were carriers of the entamoeba or its cysts. The men thus infected may be potential cases of dysentery or liver abscess.

In Mesopotamia cases of liver abscess were not confined to the hot season, but developed also in the winter months, when the temperature approximated to that of the English spring months.

To diagnose the first case of liver abscess seen is not easy. A well known manual of tropical diseases gives a list of between twenty and thirty signs and symptoms which may occur in this condition. The following analysis of the signs, symptoms, and treatment of fifteen cases of proved liver abscess which came under my treatment in fifteen months at Baghdad is an attempt to indicate the relative value of these signs, symptoms, and treatment, and may be of assistance to practitioners who have not had an opportunity of seeing these cases.

Analysis of Signs and Symptoms.

History of dysentery was present in 6 out of 15 cases. This is not of much value in diagnosis, as such a large proportion of the troops were carriers of entamoeba without having had any signs of dysentery.

Pyrexia was present in every case; it was continuous in 9 cases and remittent in 5. The temperature rarely rose above 102.4°. In 2 cases the pyrexia associated with the abscess formation commenced one week after the end of an attack of dysentery. In its early stages the pyrexia of liver abscess is frequently mistaken for that of malaria or enteric group. Rigors were present in 6 cases and heavy cold sweats in 12. They occurred at 9 to 10 p.m. and during the night.

Pallor was present in 12 cases, and was usually very marked. Slight jaundice was present in one case only.

Wasting was present in 14 cases. This appears to come on very rapidly when pus has formed and sweats are occurring.

Pain.—Local pain in the form of a tender spot on palpation over the liver was present in 14 cases. This fairly constant sign was useful in localizing the position of the abscess. The most common site of the tender spot was in the intercostal spaces over the liver in the axillary line. In these cases the abscess was usually found in the posterior part of the right lobe of the liver. If the tender spot was below the ribs on the right side the abscess was nearer the front of the right lobe. One patient with an abscess in the left lobe had a tender spot in the epigastrium. Referred pain was present in 8 cases, chiefly in the right shoulder. Three of the patients in whom the pain in the right shoulder was unusually severe afterwards developed lung complications involving and extending through the diaphragm. The diaphragm and the skin over the right shoulder are supplied by the fourth cervical nerve.

Increase of Liver Dullness.—Every case showed a general enlargement of the liver. In one case where the abscess was near the front of the right lobe a rounded mass could be felt below the ribs in front. At the back of the chest it was difficult to determine the upper level of dullness owing to the impaired note at the right base caused by the lung complications which were present in most cases. Examination with the fluorescent screen confirmed the enlargement of the liver.

Local bulging was present in nine cases, and when present was a valuable sign. When the bulging is lateral it is seen best by arranging the patient straight in his bed in a good light, and observing from the foot of the bed. In a few cases the bulging was forwards.

Epigastric varicosity was not present in any case.

Lung complications were present in 13 cases. In 12 they were confined to the right base and afforded a diagnostic sign of value. The signs observed were: Basal crepitations in 7 cases; basal pneumonia in 4 cases; pleuritic friction sound in 3 cases. In one case from which 5 oz. of pus had been withdrawn, an abscess (probably a second one) burst into the base of the right lung five days later. Ten ounces of brownish pus were coughed up in twenty-four hours, the expectoration became bile-stained on the third day, gradually diminished, and the patient made a good recovery.

Decubitus.—No characteristic position was observed.

Leucocytosis.—In fourteen of these cases a white blood count was made, and a polymorphonuclear leucocytosis was found in every case. The average white count was 18,600.

Rigidity of the right rectus abdominis was observed in about half the cases.

From the above analysis it will be seen that there were seven outstanding diagnostic signs present in this series:

1. General enlargement of the liver	...	...	15
2. Pyrexia continuous or remittent	...	...	15
3. Leucocytosis	...	...	14*
4. A local tender spot over the liver	...	...	14
5. Signs of irritation at base of right lung	...	...	13
6. Rapid wasting	...	...	14
7. Heavy sweats	...	...	12

The other signs and symptoms of value are:

Local bulging	...	...	9
Pallor	...	...	12
Rigors	...	...	6
Referred pain in right shoulder	...	...	8
Rigidity of right rectus.	...	...	

* One not examined.

Treatment.

Four of the early cases were treated by open operation and drainage by tube. Two of these were drained through incisions in the epigastrium, the exposed area of liver being packed round with gauze and the abscess opened by sinus forceps. In both these cases the *Entamoeba histolytica* was found in the discharge from the tube on the third day, although not found in the pus removed at the operation; evidently the organism was liberated during the breaking down of the abscess wall.

The other 2 cases were treated by drainage through the chest wall. After localizing the abscess by means of a glass syringe (20 c.cm.) and needle, the needle was left *in situ* and 2½ in. of the tenth rib were excised in the axillary line. The diaphragm was incised below the level of the pleura, the edges being sutured to the intercostal muscles. After packing gauze round the area of liver exposed a pair of sinus forceps was passed into the abscess cavity guided by the needle. A drainage tube was then passed into the abscess and sutured to the chest wall. One of these cases died suddenly during the night following the operation.

Pathologist's Post-mortem Report.

Dysenteric ulceration of appendix, caecum, and large intestine. One large abscess cavity in right lobe of liver drained by the tube and a second smaller one which had not been found by the exploring needle.

An ante-mortem clot was found in the right ventricle and commencement of the pulmonary artery.

The remaining 11 cases were all treated by aspiration with an ordinary 20 c.cm. glass syringe and needle with a fairly large bore, which was passed in various directions into the liver until the abscess was found.

I found the syringe to be more convenient than the aspirator, and the needle, being of smaller diameter, probably did less damage to the liver tissue; where pus had definitely formed I found no difficulty in withdrawing it. When the pus was found, as much as could readily be obtained was withdrawn, the syringe being detached from the needle, emptied, and used again as long as any pus could be withdrawn.

In seven of the eleven cases I injected 10 grains of quinine hydrochloride in 1 oz. of water into the abscess cavity. I do not know whether it did any good, as the

four cases in which quinine was not injected did as well as the seven cases with quinine.

Personally, I think it better not to inject anything into the abscess cavity for two reasons: first, because the contents of the abscess are usually sterile, and, secondly, because a low pressure in the abscess cavity encourages the flow of lymph containing emetine.

After aspiration every patient was given a course of hypodermic injections of emetine hydrochloride, 1 grain daily for one week and then on alternate days until 12 or 14 grains had been given. Whenever possible each patient was given 1 grain of emetine a few hours before operation, so that the first serum to flush the walls of the abscess should be carrying emetine.

The action of emetine in these cases of liver abscess appears to be as specific in its action as that of quinine in malaria. In addition to the fifteen cases of proved liver abscess I saw seven or eight cases of hepatitis following dysentery, some of which were probably in an early suppurative stage and which cleared up rapidly with emetine.

There were multiple abscesses in three cases. The average quantity of pus was 8½ oz. The greatest quantity in any case was 30 oz. In colour the pus was yellow in eleven cases and grey in three cases. The classical chocolate-coloured pus was seen in one case only; it was noticed that the yellow pus rapidly became much darker when exposed to the air. The pus was found to be sterile in eight cases, to contain *Entamoeba histolytica* in three cases, staphylococcus in three cases, and *B. coli* and *B. pyocyaneus* in one case each.

Results.

Fourteen out of the fifteen cases recovered completely. One case died as already described.

In my opinion the majority of these cases can be treated successfully by aspiration with an ordinary 20 c.cm. glass serum syringe. It does not appear to be necessary even to withdraw all the pus. Once the tension in the abscess cavity is relieved, the emetine-carrying plasma can pass through the walls of the abscess cavity and exert its lethal effect on the army of amoebae present there. After aspiration the temperature usually drops to normal at once, the liver rapidly diminishes in size, and convalescence is rapid.

Open operation with a drainage tube in the liver substance—that is, one end in a constantly moving delicate organ and the other in the more or less rigid chest wall—would seem to be physiologically unsound. In the type of case met with in Mesopotamia I think that open operation can only be necessary in exceptional cases.

From what I have read of tropical abscess in India, the type met with in Mesopotamia appears to be of a more acute type, to have a more toxic effect on the patient, and to be more frequently multiple.

THE TREATMENT OF UTERINE FIBROIDS BY X RAYS.

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ALTHOUGH the value of x rays in the treatment of uterine fibroids has been known since 1911, principally through the writings of Professor Bordier and Professor Gauss, it does not appear to have gripped general attention; but their researches and those of many others since have placed the treatment, more especially of bleeding fibroids, on a very firm basis, and the use of x rays is the treatment of choice for intramural fibroids. It is very useful also in intrauterine fibroids, though the success is less marked; in subperitoneal fibroids the method is least satisfactory, though, perhaps, not quite useless.

Professor Gauss of Freiburg instituted a very drastic method in one sitting. He advocated many "points of entry" over the two ovaries and uterine tumour, from the front of the abdomen, then turning the patient on her face he administered the x rays through the sciatic notches and thinner portions of sacrum, the object being not to injure the skin. To this purpose he used a very heavy current,