pregnancy (maximum secretion 0.09% HCl) and the average secretion of the same 12 patients one week after delivery (maximum secretion 0.118% HCl). In these patients the Aschheim-Zondek reaction was completely negative on the second occasion.

The case with the dead foetus at full term and the missed abortion at 12 weeks both showed a normal response and had negative Aschheim-Zondek reactions. The chorion-epithelioma followed a hydatidiform mole. The patient was first seen three days after aborting the mole; the Aschheim-Zondek was weakly positive, but negative in dilution, and the maximum secretion 0.02% HCl. Six weeks later, when she had a large malignant mass in the uterus, there was complete achlorhydria, and the Aschheim-Zondek was positive up to a dilution of 1 in 100. Hysterectomy was performed, but the patient died after operation and no further studies were possible. The patient with the hydatidiform mole was not studied while the mole was present. When seen six months later the Aschheim-Zondek was positive up to 1 in 10 and the maximum secretion 0.124% HCl. No evidence of chorion-epithelioma could be detected at this time. Four months later the Aschheim-Zondek was only weakly positive and the maximum secretion 0.302% HCl.

The seven patients who were studied more than once in pregnancy showed a low secretion of acid (average 0.036%) when the Aschheim-Zondek was strongly positive in early pregnancy and a much higher secretion (average 0.078%) towards term, when the prolan secretion was very much lower. The total acidity ran a course very similar to the free acid, with the exception that it was depressed to a less extent and that the difference between the curves for high and low prolan concentrations was less than in the case of free acid.

Comment

The hypochlorhydria of pregnancy has been ascribed to the neutralizing effects of regurgitated duodenal contents. Bile appeared in fewer than 3% of my specimens, and some of these contained large quantities of free acid. Strauss and Castle (1932) also found but few bile-stained specimens, and are of the opinion that duodenal regurgitation is not the cause of hypochlorhydria.

Evidence is brought forward here to show that in human pregnancy there appears to be some relation between the free and total acid in the gastric juice and the amounts of anterior-pituitary-like hormone secreted in the urine, and that it seems to be inversely proportional. Further studies are being made.

I wish to thank the members of the staff of the Princess Mary Maternity Hospital, Newcastle-upon-Tyne, for allowing me access to cases under their care; my friend Dr. Frank Dickens for his advice and constant encouragement; Dr. Ruth Dearing and Dr. E. Wilkinson for their invaluable help in collecting specimens; and, last but not least, the 67 patients who so willingly submitted to these investigations.

The costs of this work were defrayed by a grant from the Research Committee of the Council of King's College, Newcastle-upon-Tyne.

REFERENCES

- Anderson, D. F. (1932). *J. Obstet. Gynaec. Brit. Emp.*, **39**, 558.
 Artz, F. (1930). *Amer. J. Obstet. Gynec.*, **20**, 382.
 Culmer, C. U., Atkinson, A. J., and Ivy, A. C. (1939). *Endocrinology*, **24**, 631.
 Dodds, E. C., and Whitby, L. E. H. (1931). *The Laboratory in Surgical Practice*, p. 97, Constable, London.
 Nakai, T. (1925). *J. Biochem.*, Tokio, **5**, 465.
 Strauss, M. B., and Castle, W. B. (1932). *Amer. J. med. Sci.*, **184**, 655.

The 93rd annual report of the Board of Management of the Hospital for Sick Children, Great Ormond Street, says that during the period of the flying-bomb and rocket attacks as many children as possible were accommodated for safety in the various wartime country branches, but all the beds that could be made available in London were fully occupied. The hospital fortunately suffered only minor damage as a result of the attacks, and the casualty department gave service to many injured adults and children from outside. The report pays tribute to the late Sir Thomas Barlow, who was a member of the medical staff in various capacities for not less than 70 years, and continued to take a personal interest in the work long after his retirement from the active list. In the history of Great Ormond Street Sir Thomas held a unique position, for he was the last personal link with the founder of the hospital, Dr. Charles West, under whom he served in his earliest years. Another distinguished physician and very good friend was lost by the death of Dr. Hugh Thursfield, for 36 years an active, and afterwards consulting, member of the staff.

DIARRHOEA DUE TO GIARDIA LAMBLIA

BY

J. F. FRASER, M.B.

Lieut.-Col., R.A.M.C.

AND

ROBERT TAYLOR, M.B.

Capt., R.A.M.C.

It had long been considered that the flagellate *Giardia lamblia* (which name is adopted here instead of *G. intestinalis* or *G. enterica*, as it is in more common use) was non-pathogenic, and Napier (1944) states that until recently he had questioned its pathogenicity except in children; but in the last few years, since the introduction of a specific treatment by Brumpt (1937) and Martin (1937), all his doubts have been dispelled. Manson-Bahr (1943), too, states that all authorities are by no means agreed as to the pathogenicity of *G. lamblia*. In 1942 a report was made to the Medical Research Council (Ormiston *et al.*, 1942) concerning an outbreak of enteritis due to *G. lamblia* in a nursery for evacuees.

The present series have been studied in the medical division of a British general hospital in India over a period of 18 months. During this period there were admitted 872 cases of diarrhoeal diseases; these were differentiated into the following classes:

1. Bacillary dysentery (Flexner, Sonne, Shiga, Schmitz, and Bayd) (4 of these had associated <i>G. lamblia</i>)	237
2. Clinical dysentery (Cases with an indefinite exudate, blood and mucus in the stool, but no isolated pathogenic organisms and no <i>Entamoeba histolytica</i>)	184
3. Amoebic dysentery (4 of these had associated <i>G. lamblia</i>)	158
4. Diarrhoea with no demonstrable organisms	272
5. Giardiasis	21

The proportion of cases in which *G. lamblia* was present was 3.32%. Napier (1944) records that in Calcutta, between 1935 and 1938, of 20,000 stools examined 6.27% contained *G. lamblia*. He does not state in how many cases the flagellate was associated with other diseases, but his series includes the stools of children, in whom *G. lamblia* occurs more commonly than in adults. The present analysis is confined to the cases in which no other cause was found to account for the diarrhoea. The total number of cases of giardiasis in this series was 21.

Symptomatology

Diarrhoea.—All cases had diarrhoea on admission, the number of stools varying from 3 to 12 in 24 hours.

Pain.—Six cases had no pain. In 15 pain of a colicky nature was complained of, with an urgent desire to go to stool. Evacuation of bowels relieved the pain. In only one case was tenesmus complained of.

Flatulence.—This was not a marked feature except in 2 cases.

General Malaise.—This was usual, but not so prominent as in cases of true dysentery of the same severity.

Fever.—Two cases had a mild pyrexia (100° F.), but in only one did this persist, and then for but four days.

Loss of Appetite.—This was noted only in cases which had been ill for a few days.

Vomiting.—None complained of vomiting.

The average duration of symptoms before admission was 5.5 days; limits, 1 to 35 days. The case lasting 35 days—that of a British officer—was exceptional, as most of the B.O.R.s were admitted on the first or second day of diarrhoea. The only system affected was the gastro-intestinal. The tongue was generally coated. In the abdomen no physical abnormality was detected in 10 cases. Sites of tenderness in the others were located as follows: Generalized, 2; R.I.F., 2; L.I.F., 1; in epigastrium and right hypochondrium, 6—the liver was palpable in two of these cases. In all but two cases the stools were watery faecal, rather paler than normal, but not approaching the colour or consistency of the stool of sprue. Generally they appeared greasy, but no fat estimations were done. In two blood and mucus were present, and in one mucus only. In two cases with a long history of continuous diarrhoea—35 days and 28 days—the stools were bulky, resembling those of sprue in consistency but not in colour.

In eight cases there was no history of diarrhoea previous to the present attack. The others gave a history of repeated

attacks of diarrhoea for some weeks, and three reported alternating constipation and diarrhoea. In only one case was there a history of bacillary dysentery.

Treatment

All cases were given a five-day course of mepacrine 0.1 g. t.d.s. The stools were examined on three successive days after completion of treatment, and on all but two *G. lamblia* had disappeared. After a second course both were found to be clear. All cases were given a generous diet as soon as the diagnosis was established, and symptoms disappeared by the third day of treatment. The duration of stay in hospital was 14 days; limits, 9 to 41. The 41-day case was that of the officer mentioned previously. He had lost a great deal of weight and required building up. One other case, which had furunculosis as well as giardiasis, was in hospital for 31 days. Owing to the rapidly changing personnel of the station it was possible to follow up only two cases. One had recurrence of diarrhoea after nine months, but on this occasion the cause was bacillary dysentery, and no *G. lamblia* was found. The second had had recurrent diarrhoea for some months, but has been free for three months since his treatment.

Comment

With the exception of two cases all were admitted to hospital when the fly season was at its height. In 1944 seven cases came from one camp and seven from another. A large number of flies from the traps were examined, but no *G. lamblia* cysts or flagellate forms were detected.

It will also be noted that the description of the stools differs somewhat from that of Manson-Bahr (1943), except in two cases with long histories. It is possible that in the Army one gets the cases into hospital at an earlier stage than in civil practice, and this may explain the difference.

Summary

Twenty-one cases of diarrhoea believed to be due to infestation with *G. lamblia* are described. The percentage in relation to other diarrhoeal diseases is stated. Symptoms, physical signs, and treatment are discussed. Two cases have been followed up for a short period.

We wish to thank Major J. L. Dales, R.A.M.C., and Major M. Joseph, R.A.M.C., pathologists, for their examination of the stools; and Col. F. Cook for permission to publish this paper.

REFERENCES

- Brumpt, L. (1937). *C. r. Soc. Biol.*, Paris, **124**, 1040. (Quoted by Napier and Manson-Bahr.)
Manson-Bahr, Sir P. (1943). *The Dysenteric Disorders*, p. 258, London.
Martin, P. (1937). *Rev. Méd. Hyg. trop.*, **29**, 33. (Quoted by Napier.)
Napier, L. E. Everard (1944). *Principles and Practice of Tropical Medicine*, p. 451, Calcutta.
Ormiston, G., Taylor, Joan, and Wilson, G. S. (1942). *British Medical Journal*, **2**, 151.

Medical Memoranda

Giardiasis associated with Recurrent Rectal Haemorrhages

It may be of interest to record a case of giardiasis associated with the passage of large amounts of blood. Infestation with *Giardia lamblia* is common in Fiji, often symptomless, and in no other case have I found it associated with the passage of blood per rectum.

CASE HISTORY

The patient was a female child, 4 years old, of mixed Fijian and European descent. She first entered the Colonial War Memorial Hospital on March 13, 1944, with a history of fever, constipation, and weakness, and the passage of blood with the stools. She appeared a normal well-developed child, and general physical examination revealed no abnormality. At subsequent examinations there was a vague abdominal tenderness but no guarding. She remained in hospital till May 6, during which time the stools were persistently accompanied by the passage of blood. At times the blood was clotted, at times bright red, and mucus was often present. The stools were soft and pale, and frequently there was diarrhoea. Investigations made during the period March 13 to May 6 included five stools which were negative for worms and ova and cysts, and for bacillary dysentery. On April 12 the haemoglobin was 80% and the red cell count 3,100,000. Sigmoidoscopy revealed no

abnormality. The haemorrhages became less, her general condition improved, and she was discharged to the out-patient department.

She was readmitted on May 12 with a recurrence of blood-stained stools for three days before admission. Physical examination was again negative. Further investigations of the stools revealed the presence of *Trichuris* on May 18, and on May 27 heavy infestation with *Giardia lamblia*. Eight further stools submitted subsequent to treatment of the *Giardia* infection were negative for that parasite, though hookworm and *Trichuris* were afterwards found and treated. The Widal test was negative for *E. typhosa* on May 27, and barium enema and radiographs of the chest showed no abnormality of the large bowel or lungs. The anaemia was at its worst on June 1, with haemoglobin 60% and red cells 2,800,000. Apart from treatment of the anaemia the patient was given 3/4 grain of mepacrine hydrochloride three times a day for 5 days following the discovery of *Giardia* on May 27. This course was repeated after 10 days' interval. After the first course of mepacrine no blood was observed with the stools, and eight further stools were negative for *Giardia*.

The patient was discharged on June 22, 1944, her general condition having gradually improved since the course of mepacrine.

My acknowledgments are due to Dr. V. W. T. McGusty, C.M.G., O.B.E., Director of Medical Services, Fiji, for permission to publish this case.

GEORGE R. HEMMING, M.B., B.S.,
Medical Officer, Colonial War Memorial Hospital.

Suva, Fiji.

Spontaneous Lobectomy

The description of a case of spontaneous lobectomy associated with *Bacillus friedländeri* infection by J. W. Taylor (*B.M.J.*, 1944, **2**, 500) has prompted me to put on record two further cases of this uncommon condition.

CASE I

A man aged 41 was admitted to Queen Elizabeth Hospital, Birmingham, on Feb. 3, 1942, under the care of Dr. A. Brian Taylor. He gave a history of two weeks' illness, beginning with a rigor and continuing with pain in the right side of the chest, cough with blood-stained sputum, dyspnoea, and pyrexia. He had been treated with sulphapyridine. On admission he was thin, dyspnoeic, looked ill, and had a temperature of 100°. Clinical examination suggested a moderately large right pleural effusion, more posterior than anterior. This was confirmed by radiographs, a lateral view showing a convex anterior border to the shadow. Aspiration produced thick brown foul-smelling pus, which on culture yielded a heavy pure growth of *B. friedländeri*. The sputum was purulent, and contained a heavy mixed bacterial flora with a marked preponderance of *B. friedländeri*. On Feb. 5 drainage of the empyema was performed under local analgesia, a portion of the 9th rib being resected. The cavity extended upwards and forwards and was limited below by necrotic tissue. Closed drainage was instituted for 12 days, and then open drainage, and pleural wash-outs were started. On the 18th day after aspiration, while a pleural wash-out was being performed, the patient had a fit of coughing, and through the sinus he coughed a piece of tissue corresponding in size to a large portion of the lower lobe. Although necrotic, its pulmonary structure was quite recognizable. Progress henceforward was satisfactory, and although the sinus continued to discharge for a few months it eventually healed and has remained dry. The patient is now back at work.

CASE II

A man aged 49 was admitted to this hospital on Jan. 25, 1944, under the care of Dr. A. Brian Taylor. He gave a history of "influenza" two months previously, followed by cough, high temperature, and delirium. He was treated with sulphapyridine and improved. Since then he had continued to cough, bringing up purulent sputum and complaining of pain in the left chest.

On admission he was thin and had a temperature of 101°. The percussion note was impaired over the left upper thorax, with diminished bronchial breath sounds. X-ray examination showed a fluid level in the left chest, rather anterior, at the level of the third costal cartilage. Paracentesis in the fourth space in the anterior axillary line produced creamy odourless pus which yielded a moderately heavy pure growth of *B. friedländeri*.

On Feb. 3 operation was performed under local analgesia. A portion of the 5th rib was resected in the anterior axilla, and foul thin pus was found and withdrawn. During this procedure a slough of necrotic upper lobe measuring about 10 by 8 by 3 in. came out, and a persistent bronchial fistula was left. Open drainage was instituted; 48 hours later a violent secondary haemorrhage occurred into the pleura and through the tube, and was accompanied by haemoptysis. A blood transfusion of two pints was given, and his condition improved. Some bleeding occurred at intervals for nearly two weeks.

The patient became afebrile and his condition gradually improved, although his cough continued for a time. Three weeks after drainage, radiographs showed in the opposite upper lobe an abscess cavity which had not previously been present, and sputum yielded a heavy nearly pure growth of *B. friedländeri*. This right-sided cavity became smaller and disappeared without any surgical intervention. The patient is now about and feels well, but still has a large sinus with a bronchial fistula. Pleurograms show an anterior apical cavity with several bronchial openings, probably into the pectoral and ventral branches of the upper-lobe bronchus, the axillary-apical bronchus appearing intact.