normal or slow. I do not anticipate any benefit from digitalis in such a case.

In others, however, we find the pulse-rate persistently rapid and much increased on exertion. It is extremely probable that this increase of rate has a definite result in the way of producing over-action and weakening of the left ventricle, as well as of the right. In several cases of this nature I have given digitalis in order to prevent weakening of the heart and to postpone, as far as possible, the onset of cardiac failure. It has seemed to me that distinct benefit has followed in these cases from the slowing of the heart induced by digitalis. The action was always on the sino-auricular node, so that the normal rhythm was preserved, and the patients had always had rheumatic infection, so that the heart may have been in a sense prepared for digitalis. As a preventive of cardiac failure, the usefulness of digitalis in slowing the heart under these special conditions might be further tested.

CONCLUSION.

I have now dealt, very imperfectly as I know, with some additions to our knowledge of heart disease, and some changes in our views regarding it. As an observer I cannot reproduce to you the results exactly as they are but only as they appear to me to be. Looking backwards we recall with gratitude the light thrown on the subject of heart disease by eminent clinicians in the past. Advance in clinical medicine and by clinical methods has not come to a standstill. Looking forwards we see one of the best guarantees of future progress in the existence of a band of British workers who are devoting themselves enthusiastically to the further elucidation of the problems of heart disease. May I add that this College desires to extend to them all the support and encouragement in its power.

Literature.

- Balfour, G. W.: Clinical Lectures on Diseases of the Heart and Aorta, 1898; The Senile Heart, 1894.
 Barr, Sir James: Paroxysmal Tachycardia. Brit. Med. Jour., 1904, ii.
 Broadbent, Sir W. H.: Heart Disease, 1897.
 Branton, Sir Lauder: Therapeutics of the Circulation, 1914.
 John, Fraser, and Jamieson: Influence of Digitalis on the T Wave of the Human Electro-Cardiogram, Jour. Experimental Medicine, 1915, xxi.
 Coombs, Carey: Rheumatic Myocarditis, Quart. Jour. Med., 1908, October.
 Oushny, Marris, and Silberberg: On Digitalis, Heart, 1912-13, iv., 33.
 Oushny, A. R.: Pharmacology and Therapeutics, 1915.
 Dixon, W. E.: The Selective Action of Drugs on Nerve-endings, Proc. Roy. Soc. of Med., 1912, vi., No. 1 (Therap. and Pharm. Section); The Digitalis Preparations Employed in Medicine, Quart. Jour. Med., 1912, January.
 Dunn, C. A.: Cardiac Disease in Childhood, Am. Jour. Dis. of Child., 1913, vi.
 Eggleston, Cary: The Durability of Digitalis Action, Jour. Am. Med. Assoc., 1912, lix.
 Fleming, G. B.: Triple Rhythm due to Extra-systoles, Quart. Jour. Med., 1912, April.
 Gaskell, W. H.: The Contraction of Cardiac Muscle, Schäfer's Physiology, 1900.
 Hume and Clegg: A Study of the Heart in Diphtheria, Quart. Jour. Med., 1914, October.
 Kemp, C. G.: Acute Articular Rheumatism, Quart. Jour. Med., 1914, April.
 Lewis, Thomas: Clinical Disorders of the Heart-beat, 1912; Clinical Electro-cardiography, 1913; The Mechanism of the Heart-beat, 1911; Paroxysmal Dyspnoea in Cardio-renal Patients, Brit. Med. Jour., 1913, ii.; Auricular Flutter, Heart, 1912, iv., No. 2; The Pathology of Heart Function, THE LANCET, 1914, ii., 882.
 Lewis and Silberberg: The Origin of Premature Contractions, Quart. Jour. Med., 1912, April.
 Mackenzie, Sir James: Diseases of the Heart, 1913; Principles of Diagnosis and Treatment in Heart Affections, 1916; Digitalis Heart, 1911, ii., No. 4; The Soldier's Heart, Brit. Med. Jour., 1916, i.
 Naish, A. R.: Conduction in the Auricles, Quart. Jour. Med., 1914, October.
 Parkinson and Rowlands: Strychnine in Heart Failure, Quart. Jour. Med., 1913, vii., No. 25.
 Parkinson, John: The Cardiac Disabilities of Soldiers on Active Service, THE LANCET, 1916, ii.
 Powell, Sir R. Douglas: Treatment in Diseases and Disorders of the Heart, 1899.
 Price, F. W.: Digitalis and the Blood Pressure in Man, Brit. Med. Jour., 1912, ii.
 Ritchie, W. T.: Auricular Flutter, 1914; The Action of the Vagus on the Human Heart, Quart. Jour. Med., 1912, October.
 Rudolf, R. D.: The Use of Digitalis in Practice, Canada Lancet, March, 1914; The Irritable Heart of Soldiers, Canad. Med. Assoc. Jour., 1916, September.
 Starling and Markwaller: The Constancy of the Systolic Output under Varying Conditions, Jour. of Physiol., 1914, xlviii., No. 4.
 Starling and Patterson: The Mechanical Factors which Determine the Output of the Ventricles, Jour. of Physiol., 1914, xlviii., No. 5.
 Starling, Patterson, and Piper: The Regulation of the Heart-beat, Jour. of Physiol., 1914, xlviii., No. 6.
 Stevens, H. W.: Electrocardiographic Studies of Patients under Digitalis Treatment, Boston Med. and Surg. Jour., 1916, i.
 Wiggers, C. J.: The Circulation in Health and Disease, 1915.
 Windle, J. Davenport: Prognostic Value of Pulsus Alternans in Myocardial and Arterial Disease, Quart. Jour. Med., 1913, July.

FURTHER EXPERIENCES WITH EMETINE BISMUTH IODIDE IN AMŒBIC DYSENTERY, AMŒBIC HEPATITIS, AND GENERAL AMŒBIASIS.

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(Report to the Medical Research Committee.)

IN THE LANCET of August 19th, 1916, Dobell and myself briefly described three cases of infection by *Entamoeba histolytica* treated by emetine bismuth iodide. Two of these have since been followed up accurately, one W. (No. 3) by Dobell, the other C. (No. 2) by myself. Neither of these has ever shown *E. histolytica* cysts again and C. has had no further clinical signs of dysentery. Dietetic errors and cold and damp have, it is true, produced a certain amount of abdominal discomfort and slight pain, but, after extensive ulceration of the bowel, one could not expect otherwise. With these symptoms no blood or mucus appeared in the stools and, as stated above, no parasites were found. Coincident with the disappearance of the dysenteric symptoms the patient improved in general condition and gained weight. Both these cases, I think, may be considered as complete and permanent cures. Tables I. and II. show at a glance the detailed examinations of the stools.

The value of the double iodide of emetine and bismuth, by the mouth, in the treatment of histolytica carriers is now fully recognised; it remained to be seen, however, whether the drug would be equally efficacious in cases where liver involvement had also taken place. In the following series of cases to be described three cases of amœbic hepatitis figure and, as will be seen later, very good results have also been obtained. In addition an example of the somewhat rare condition "general amœbiasis" is included. By this term is meant a febrile state without dysenteric and manifest liver symptoms, yet responding quickly to treatment by emetine. *E. histolytica* cysts may be found only with great difficulty, but if sufficient numbers of faecal examinations are made they should eventually be demonstrable.

Method of administration.—To begin with, keratin-coated tablets and stearetttes were tried and appeared to act satisfactorily. In one instance, however, suspecting that the drug was not being absorbed, the stools were carefully examined and three stearetttes were recovered quite unchanged. The uncertainty of such an occurrence taking place in other cases decided one therefore to employ the drug in all the other patients as the loose powder in an ordinary gelatin capsule, similarly to the first cases treated by Dobell and myself. The dosage in all the series has been 3 grains nightly for 12 consecutive nights, as originally recommended by Dale.

A certain amount of sickness occurred in some of these, but this was never of sufficient importance to interfere with the continuation of the treatment, and the same may be said of the diarrhoea which is sometimes met with. To prevent sickness the precautions that were of use in the ipecacuanha days may be employed, the drug, however, in this instance being given on a full and not on an empty stomach. During the course the patient is better kept strictly in bed, the diet being arranged in accordance with the acuteness or chronicity of the symptoms. For most cases a light diet consisting of milk, white meat, and white fish will be found most suitable. At 10 P.M. a small meal should be given, arrowroot, sago, tapioca, or cornflour with a little milk, for example and then immediately after this the capsule is taken. Five to ten minutes later some boiling water should be sipped, and this should be repeated if any sign of nausea or sickness occur throughout the night. For the first few nights, until one sees how the patient is to tolerate the drug, the pillows should be removed so as to keep the head low, no movement should be allowed, and if saliva accumulates in the mouth it must on no account be swallowed, but should be expectorated or removed by cotton swabs. If after all these precautions the patient is still sick a mustard leaf may be applied to the epigastrium on subsequent evenings, or 10 to 20 minims of tinct. opii may be given half an hour before the administration of the emetine. Such precautions will greatly mitigate, if not entirely prevent, sickness.

The occurrence of this symptom is a very variable one; sometimes the first doses produce it and then a tolerance is established, while in other cases it appears towards the end of the course or irregularly throughout it. Three to four hours after taking the capsule is the usual time for the sickness to appear; there may be one emesis and then no more,

or this may be followed up by others with some nausea and discomfort on the following day. In private practice and in ordinary civil hospital practice, when the drug is given in a proper manner and with the ordinary precautions the symptom is of little importance, and may be entirely disregarded in the majority of the cases. In the old days such patients used to take their ipecacuanha without any trouble, the symptoms produced being much more unpleasant than those met with in the above drug.

As regards diarrhoea, a certain amount of this is beneficial rather than otherwise; if excessive it may easily be checked by the administration of opium.¹

Notes of Cases.

General amoebiasis.—**History.**—Patient (McC.) went to Africa April, 1916. He soon had some slight attacks of malaria, but otherwise kept well. In October of the same year he began to feel run down and got tired very easily. He then went and consulted Dr. Gray at Lagos, who, on examining his stools, found *E. histolytica* cysts present. Seven injections of emetine, gr. 1, were given and the patient returned to work. General weakness and the tired feeling soon appeared again, so it was decided to send the patient home.

Examination.—Temperature varying from 101–102° F. at nights. Looks seedy and has lost weight. Teeth black, but sound. Small glands palpable in posterior triangles of neck. Lungs nil. Heart sounds a little weak; pulse 100, feeble. Liver, perhaps a little enlarged upwards, level of 5th and 6th ribs and costal margin. Spleen not palpable. No pain on shaking liver nor on deep pressure and percussion. No pain or tenderness over colon. Blood examination: R., 4,600,000; W., 13,000; Hb, 90 per cent. Differential count per cent. was: Polymorphs, 70.5; large mononuclears, 10; lymphocytes, 17.5; eosinophiles, 0.5; transitional, 1; mast cells, 0.5. Number counted, 200. No malarial parasites or trypanosomes. Urine: No albumin, blood, or sugar. Faeces: Heavy infection with *Entameba coli* cysts, one amoeba? species. Two doubtful cysts that might have been histolytica. Wassermann reaction negative on two occasions.

As regards a past dysenteric history, the patient stated that he had never had clinical signs of dysentery nor, as a matter of fact, even any diarrhoea. He was very emphatic about this. Further, he never had had any liver pain or tenderness, his only clinical signs being weakness, some loss of weight, and irregular temperature.

Treatment.—As his temperature was high and I did not like his appearance, and as Dr. Gray had found definite histolytica cysts in his faeces in Africa, I did not wait, but started a course of emetine bismuth iodide at once. This was begun on the night of Jan. 11th, 1917, and its effect upon the temperature was at once apparent, this quickly dropping to normal. As marked as this was the effect of the drug on the patient's general condition, he stating that he felt very much better^{*} and, further, his leucocytes, which were raised when he came into hospital, also became normal.

Further history.—The improvement has continued up to the date of writing this paper, the patient has had no further fever, he has steadily gained in weight, histolytica cysts have not reappeared in the faeces, and to all intents and purposes he is cured.

Chart showing the temperature of patient (McC.).

Table III. shows his faecal and blood examinations and the chart his temperature. A study of the former shows that the coli cysts, though disappearing at first, returned and became as numerous as before, a point specially noted by Dobell in several of his series of examinations.

Amoebic Hepatitis Cases.

1.—**History.**—Patient born in England, went abroad to India in 1900. Served there since with usual leaves home. Came home to England April, 1916. Previous illnesses: Attack of dysentery three years ago, very bad one. Since that date had had relapses off and on. Last attack a month ago. A little blood and mucus. Twelve stools a day one day during this period. Treated in India. ? ipecacuanha, never emetine. Frontier sores two years ago, malaria several attacks, never venereal. Present condition: Lately has been very weak, and this has gradually been getting worse. Has lost weight, about a stone; sweats at nights.

¹ Dr. H. H. Dale, who has read this paper in manuscript, tells me that recent experience seems to indicate that the trouble of nausea and vomiting may be eliminated, or reduced to trivial proportions, by giving the double iodide in pills coated with salol. Of a number of formulæ which have been tried the most successful was a pill with simple syrup as excipient and salol coating. Such pills usually pass through the stomach without causing trouble, and appear to break up satisfactorily in the intestine, so that the curative effects are good.

Examination.—Looks ill. Teeth very bad. Stripped, very thin. Apices shrunken, poor chest, somewhat pigeon-shaped. No definite signs of tubercle; no dulness at right base. Heart sounds faint; no murmurs. Liver level of 6th and 7th ribs and a little below costal margin; slightly tender at one place and uncomfortable on shaking. Spleen level of 9th–11th ribs. Urine: No albumin, blood, or sugar. Faeces: No amoebæ or cysts first examination. A further examination three days later showed scanty histolytica cysts. Blood examination: R., 4,900,000; W., 14,000; Hb, 95 per cent. Differential count: Polymorphs, 74; large mononuclears, 4; lymphocytes, 20; eosinophiles, 1; transitional, 1 = 100.

Diagnosis.—Amoebic hepatitis. ? abscess commencing.

Treatment.—Usual course of emetine bismuth iodide, 3 gr. nightly for 12 consecutive nights. Stearetttes were used to begin with, but later were crushed up into powder, as about this same time I had another case in which these were passing unchanged. The patient quickly lost his liver pain. He expressed himself as feeling very much better, his leucocytes fell to normal, and he began to pick up weight. No cysts have been found in his stools since taking his course. Though still a little nervous and excitable, symptoms not associated with dysentery specially, he is now well and has had no further signs of liver pain. Table IV. shows the results of his treatment at a glance.

2.—**History.**—Patient had lived in India for 12 years. Previous illnesses: Enteric in 1906. Slight attacks of colitis on several occasions, never off duty for these. One attack of malaria only. Pleurisy 4 years ago, left side. Present illness: While at home in England 2½ years ago got an attack of liver. Returned to India at the outbreak of war and went to Mesopotamia in November, 1914. Kept well for the first six months. After that began to get diarrhoea, liver became enlarged and tender. Had rises of temperature also. *E. histolytica* found in stools. Given emetine, 7 doses of ½ gr. each. Improvement on voyage home, but on arrival not feeling fit and liver still tender. Dr. Stevenson examined his stools and found active amoebæ and cysts (*E. histolytica*).

Examination.—Slightly cachectic-looking, cheeks sunken, conjunctiva a fair colour. Lungs and heart nothing of importance. Liver enlarged, edge felt below costal margin, left lobe tender and felt hard. Spleen level of 9th–11th ribs. Urine: No albumin, blood, or sugar. Faeces: Free amoebæ and cysts. *E. histolytica* (Stevenson).

Diagnosis.—Amoebic dysentery and amoebic hepatitis.

Treatment.—Emetine bismuth iodide, gr. 3 nightly, for 12 consecutive nights. (First part of course stearetttes, latter part same crushed into powder.)

Progress.—The amoebæ and cysts quickly disappeared from the stools and have not reappeared. The liver tenderness still persisted, however, a month and a half after the treatment. It is probable that this is due to adhesions having formed between the liver and diaphragm, or between the liver and adjacent viscera. The patient has improved in health and gained in weight, but is not yet normal.

Table V. gives the details of his faecal and blood examinations.

3.—**History.**—Patient (McG.), born in Scotland, went to Burma in 1912; in Rangoon in civil employment. Joined Army in 1914; France early in 1915; left there in December, 1915, and went to Mesopotamia, arriving in January, 1916. Invalided for jaundice and dysentery to Bombay; there two months, then sent home. Previous illnesses: Fever at times in Burma, no dysentery there, no venereal. Present illness: Dysentery in Mesopotamia. Seven to eight stools a day. No blood, mucus only; severe tenesmus. Given emetine four injections of 1 gr.; this stopped the dysentery at once, all symptoms disappearing. After this jaundice and abdominal pains. While in hospital at Bombay Widal negative to all typhoid group and nothing grown from stools; rigors and pain over gall-bladder, also bad pyorrhoea. Lately tendency to constipation and pain over gall-bladder region still.

Examination.—Heart and lungs nil. Tender over liver on deep percussion and also tender on pressure over lower border of liver in gall-bladder area. Liver enlarged both upwards and downwards. No tenderness over colon. Spleen not palpable. Blood examination: R., 5,000,000; W., 6000; Hb, 100 per cent. Differential count per cent.: Polymorphs, 63; mononuclears, 11; lymphocytes, 22; eosinophiles, 2; transitional, 1; mast cells, 1. Films: No malarial parasites. Urine: No albumin, blood, or sugar. Faeces: *E. histolytica* free, minuta stage. *E. histolytica* cysts. *E. coli* cysts. No ova.

Diagnosis.—Amoebic dysentery carrier, amoebic hepatitis.

Treatment.—Painted tender area with lin. iodi. Course of emetine bismuth iodide, gr. 3, in powder in gelatin capsules for 12 consecutive nights.

Progress.—The patient took his first three doses without trouble, but was sick after the fourth. After this there was no further sickness, but a diarrhoea started, which, however, was easily controlled by tinct. opii. About the middle of the course the pain over the liver diminished and he felt better. On Jan. 23rd, the day after the course was finished, he passed some mucus in his stool and felt his liver a little,

[illegible][illegible]

E = Treatment with emetine bismuth iodide, gr. 3. **+** = Positive result, small infection. **++** = Moderate infection. **+++** = Heavy infection. **-** = Negative result. **E. h.** = *Entamoeba histolytica*, amœboid stage. **E. h. c.** = *Entamoeba histolytica* cysts.

[illegible]

Temperature raised at beginning, came quickly to normal after the emetine begun. See chart. E. c. c. = *Entamoeba coli* cysts. Other signs as before.

Date	Dec., 1916																	1917: Jan. Feb.			
	4	7	8	9	10	11	12	13	14	15	16	17	18	20	21	12	6				
—		E	E	E	E	E	E	E	E	E	E	E	E								
E. h.	—	—				—	—	—	—	—			—	—	—	—	—				
E. h. c.	—	+				—	—	—	—	—			—	—	—	—	—				

No mark means stool not examined on that day. Other signs as before. This patient started his treatment with stearettes, after the 13th these were crushed up and given in powder form.

[illegible]

Leucocytes.—Jan. 1904. 6000, 2000, 2200, 2400, 2400, 2500, 2500.

Date	Jan. 1917																															Feb.											
	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6	7	8	9	10	11	12										
—	E	E	E	E	E	E	E	E	E	E	E	E																															
E. h.	+	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—										
E. h. c.	+	+	+	+	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—										
E. c.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—										
E. c. c.	+	—	—	—	—	—	—	—	—	—	—	—	—	—	—	+	—	+	+	—	+	—	—	+	—	+	—	+	—	+	—	+	+										

[illegible][illegible]

Date		Dec., 1916																		Date		Dec., 1916																	
		6	7	8	9	10	11	12	13	14	15	16	17	18	22	28	6	7	8			9	10	11	12	13	14	15	16	17	18	22	28						
—	E	E	E	E	E	E	O	O	E	O	E	E				—	E	E	E	E	E	E	O	O	E	O	E	E											
E. h.	+	+	—			—		—		—			—	—	—	E. c.	?	—	—			—	—			—				—	—	—							
E. h. c.	—	—	—			—		—		—			—	—	—	E. c. c.	+	—	—			—	—			—				—	+	+							

Stearettes passed unchanged on Dec. 12th, 13th, and 15th.

while there was also a slight rise of temperature the same evening. The blood showed leucocytes 10,600 with no sign of malaria. Two days after, the pain over liver disappeared and up to the present has remained quiescent. Convalescence though somewhat slow has been sure and there is reasonable hope of a permanent cure. Table VI. shows the results of his treatment at a glance.

Convalescent Carrier Cases.

1.—*History*.—Patient (Ch.) joined the Army in 1914. Went to India in October, 1914. Stayed there till March, 1915, when invalided home for heat-stroke. Before leaving also contracted dysentery. Treated for this on way home by emetine injections, four in all. Finally invalided out of Army for epileptic fits. Present illness: After leaving Netley was treated at home by rest in bed and milk diet. Got much better after this. Afterwards went to Bournemouth, began ordinary diet, this being followed by diarrhoea and severe bleeding. Another relapse in October, 1915. Next two fits. Then another relapse of his dysentery. Treated by ipecacuanha, 2 dose, and by more emetine injections. During 1916 bowels still very loose and anything easily upset him. Lately has had constipation alternating with diarrhoea; pain in the abdomen as well.

Examination.—Heart sounds, nothing to note. Says he gets out of breath very easily if he takes any exertion. Lungs no signs of tubercle. Some pain over colon on deep pressure. Urine: No albumin, blood, or sugar. Fæces: *E. histolytica* cysts heavy infection, *E. coli* cysts; no flagellates, no ova.

Diagnosis.—Amoebic dysentery, cyst carrier.

Treatment.—Emetine bismuth iodide, gr. 3, powder in gelatin capsules, nightly for 12 consecutive nights.

Progress.—Improved after course very much, all diarrhoea and pain disappearing. Patient also felt stronger and stated that he had never felt so well since acquiring his dysentery. Cysts disappeared rapidly from his stools after commencing treatment and have not reappeared (Table VII.). On Jan. 18th, 1917, an intensive daily examination of the fæces was begun, this lasting for over three weeks. Cysts have been absent during the whole of this period, and a permanent cure may be confidently anticipated. All symptoms have disappeared and the stools now are normal in number and consistence.

2.—*History*.—Patient (Q.), born in Newfoundland, joined Navy in 1910; been in it since. After war in Mediterranean chiefly. Present illness: At Tunis, Sept. 16th, 1916, seized with dysenteric symptoms, mucus, blood, and tenesmus, but not much straining. Went into hospital. Emetine 15 injections in all, 2 dose. Much better after these. Stools now one or two a day, normal. Pain in abdomen occasionally.

Examination.—Some bad teeth. Heart and lungs nothing to note. Liver level of 6th and 7th ribs and costal margin; spleen level of 9th–11th ribs; no pain in abdomen. Urine: No albumin, blood, or sugar. Fæces: *E. histolytica* cysts, moderate infection; *E. coli* cysts, heavy infection.

Diagnosis.—Old dysentery, amoebic carrier.

Treatment.—Emetine bismuth iodide, gr. 3, powder in gelatin capsules, for 12 consecutive nights.

Progress.—Histolytica cysts quickly disappeared (Table VIII.) from the stools and have not returned. The patient is well and now shows no signs of any abnormality in his bowels.

Relapsing Amoebic Dysentery 26 Years after Original Infection.

History.—Patient (McL.) had acute dysentery in Egypt in 1890. Ten years later in England a relapse, treated by ipecacuanha, promptly recovered. Since that date until December, 1916, no intestinal disorders of any sort. Present illness: Started with an attack resembling influenza. Pain all over and aching bones. Then suddenly seized with all the symptoms of acute dysentery: blood, much mucus, great straining, abdominal discomfort, and passage of numerous stools. Fæces: Stools typically dysenteric, much blood and mucus. Amoebæ present, *E. histolytica*, minuta stage, and coli cysts.

Treatment.—Stearettes of emetine bismuth iodide, 3 gr. in each, were immediately begun. The symptoms at once responded to these, the amoebæ disappeared from the stools, also the blood and mucus, and the patient quickly recovered. As constipation set in during the middle of the course, one suspected the possibility of the stearetttes not dissolving, and an examination of the stool proved that this was so, three stearetttes being recovered quite unchanged. (This is the case referred to at the beginning of the paper.) That the first stearetttes did dissolve, however, is fairly certain, as there was considerable nausea after taking them and the symptoms cleared up so quickly. Since then there has been no clinical relapse. Stool examinations were only possible on three occasions after the end of the treatment. The case is reported to demonstrate the extraordinary chronicity of an amoebic infection.² Table IX. shows the treatment and faecal examinations at a glance.

² See also Brit. Med. Jour., Dec. 23rd, 1916, for details of another example.

A brief study of this series of cases shows that emetine given by the mouth, as emetine bismuth iodide, is apparently as efficient as emetine by the needle in cases of amoebiasis with liver involvement. Ipecacuanha used to act also, it is true, but one of its disadvantages was the sickness so often produced, this being badly borne by patients suffering from severe liver pain. These facts must mean that sufficient emetine is absorbed into the general circulation to act on the parasites in the liver, it being conceded, of course, that parasites are actually there when hepatitis, enlargement of the liver, and leucocytosis are present, the precursors of a definite abscess formation. The advantage of oral administration over hypodermic in such cases would seem to consist of the more potent sterilising powers ultimately shown by the double iodide on the amoebæ in the bowel, thus removing a possible source of subsequent reinfection of the liver.

Dobell has shown that in cases treated by emetine hydrochloride subcutaneously 70 per cent. relapse, whereas when emetine bismuth iodide is employed by the mouth this figure is reduced to about 10 per cent.; or stating this as regards cures, only 30 per cent. are got by the former, 90 per cent. or more by the latter. If, then, the latter can get rid of the acute symptoms satisfactorily and at the same time quickly, it is the best drug to use, as it is much more likely to sterilise the patient completely of his parasites in the bowel lesions at the same time. In cases of great urgency it might be advisable to give some injections first and then to follow these up by the oral method.

A point one may mention here, especially so as many people appear to entirely misunderstand it, is that the emetine does not kill the cystic stage of the parasite; it kills the amoebæ or active living forms which are present in the tissues of the bowel. The cysts in the fæces are being cast off, and only indicate that there are living amoebæ in the bowel producing them. If all the amoebæ are killed, then there can be no further production of cysts; the stools become negative and remain so permanently.

As far as one can judge, then, at present, emetine bismuth iodide holds out good hope of permanent cures in the different varieties of amoebiasis, in the sense that the patient is entirely sterilised of his amoebæ. The subsequent course of the disease will depend upon the extent of the original lesions—namely, the amount of bowel denuded of epithelium, deep ulceration producing peritoneal adhesions, strictures of the bowel, adhesions between liver and diaphragm, or between liver and adjacent viscera, and so on. Attacks of pain, bouts of diarrhoea, and definite colitis are not infrequent even after all signs of amoebæ have disappeared. The patient, it must not be forgotten, must be strictly dieted for a long period after his course of emetine; he must avoid wet and damp, and should abstain entirely from alcohol.

Some clinicians still prefer ipecacuanha in these chronic relapsing cases. In the old days the drug acted very well clinically, but in the light of modern research careful and prolonged faecal examinations would have to be made in order to determine the real value of such cures. If the emetine is the real essential in the ipecacuanha then a much larger dose can be given in a more convenient form by the use of the double iodide.

Finally, as regards dosage, if those who try the drug would attend carefully to the rules laid down for its administration there would be fewer disappointments. Some working standard must be adopted, and experience shows that that recommended by Dale of 3-grain doses every night for 12 consecutive nights (36 grains in all) is a good one. Dobell suggests that some cases may require an increased quantity, and in such the period may be extended even to 20 instead of 12 nights. Not less than 36 grains in all should be given, as smaller quantities are generally followed by relapse. The case mentioned at the beginning of the paper (W., No. 3) is the only one, according to Dobell, that has been cured by so small a total as 15 grains in all—viz., 3 grains on five consecutive nights.

I have again laid stress on this dosage, as this has been misquoted and incorrectly stated, at least three times, in different journals.³ It is to be hoped that those incorrect statements have not led people into errors in prescribing the drug.

³ In an abstract of the paper by myself and Dobell (THE LANCET, August 19th, 1916) in the *Journal of the American Medical Association* (Sept. 16th, 1916, p. 908), again in the *Prescriber* (vol. xi., No. 24, January, 1917, p. 12), and, lastly, in the *Journal of Tropical Medicine and Hygiene* (Feb. 1st, 1917, p. 30) from subsequent papers by Dobell.