intestinalis and *Tetramitus mesnili*, inhabiting the large bowel. These, of course, have been known to tropical workers, and not only known but studied for years. Some have suggested that they cause diarrhoea, but on the whole the consensus of opinion is that they are harmless. They certainly are to many individuals, who may harbour them (*Lambia* at least) for long periods of time with no symptoms, but that, of course, does not preclude the possibility of them becoming pathogenic under certain unknown conditions. It is very improbable that they ever produce dysenteric symptoms; in fact, one may say they never do. The fact of them being found in dysenteric stools, as they have been recently, in many instances in cases coming to London from Gallipoli, simply means the patients have had a double infection, the dysentery being due to Shiga's or Flexner's bacillus, paratyphoid bacilli, or other bacterial causes.

It may even be that the flagellates flourish better in a bowel already damaged, but careful examinations of apparently healthy individuals in the tropics would tend to negative this, as sometimes the heaviest infections seem to occur in people with no bowel symptoms whatsoever. If they are harmless there is no special necessity to destroy them by treatment. In a case of *Lambia* infection Dr. Wenyon and I recently studied—the case that had *Entamoeba histolytica* cysts—we tried emetine and other drugs. Emetine had no effect whatsoever, while beta naphthol though causing a diminution of the parasites did not completely destroy them, and after the drug was stopped they became as numerous as ever again. As already emphasized, emetine has no effect on bacillary dysentery. The treatment of this disease is quite a different one, being chiefly carried out by diet, salines and serums, and the diagnosis of this type is purely a bacteriological one, similar to that of typhoid and paratyphoid fever.

ON A CASE OF SEPTICAEMIA TREATED BY INTRAVENOUS INJECTION OF EUSOL.

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Preliminary Note.

In the paper on the antiseptic action of hypochlorous acid which was published in this JOURNAL on July 24th, 1915, by Lorrain Smith, Murray Drennan, Rettie, and Campbell, it was shown that 5 c.cm. of eusol can be injected intravenously into rabbits without harmful effect. In the paper referred to the name "eusol" had been given to an aqueous solution of free hypochlorous acid of 0.5 per cent. strength, prepared by shaking up 25 grams of a mixture of equal parts of chloride of lime and boric acid in 1 litre of water and subsequently filtering. For intravenous injection 8.5 grams of common salt per litre are added. Since July we have made further observations, and find that 25 c.cm. can be injected intravenously in the rabbit without harm, and in one case as much as 45 c.cm. were given—that is, an amount equal to a quarter or half of the total blood volume.

The possibility of applying this method to generalized septic conditions was offered by a case of puerperal septicaemia which was sent into the Royal Maternity and Simpson Memorial Hospital, Edinburgh. The following is a summary of the clinical account of the case:

Mrs. M., aged 27, 4para, delivered without assistance of a female child on October 5th. When the maternity nurse arrived she found the patient sitting by the fire with the baby in her lap. Placenta had not come away but was expelled naturally shortly afterwards. The progress was normal till the fourth day when, though the patient had not complained, she was found to have a rise of temperature. The pyrexia continued, and on the sixth day had reached 103° F. with a pulse-rate of 126. The breathing was rapid and shallow, with a short suppressed cough and some pain on the right side of the chest. On examination there was a suspicion of bronchial breathing

over a small area in the right base. The patient was removed to the hospital, where a diagnosis of puerperal septicaemia was made, the lung condition being looked on as secondary and slight in extent. On the day following admission the temperature was normal for a few hours, but this was followed by a steady rise till three days later it reached 103.4° F., pulse 145, respirations 38. The patient's condition was looked on as excessively grave and the prognosis hopeless. At Sir Halliday Croom's request we undertook treatment with eusol.

In view of the animal experiments we decided to begin with a dose of 100 c.cm. Dr. R. W. Johnston exposed the median cephalic vein, and we injected with a transfusion apparatus 100 c.cm. of eusol made up in normal saline, and warmed to 37° C.; the injections took five minutes. The temperature was rising at the time of the operation, and continued to rise for an hour thereafter, when it reached 106° F. It then fell continuously for twelve hours till it reached 96° F. Stimulants were administered, and the temperature slowly rose again. When it reached 101°, about twenty-four hours after the first injection, another dose of 100 c.cm. of eusol was injected. The temperature ceased to rise, and continued for four days between 99° and 101°, and then fell to normal, where it remained for five days.

The patient then developed pelvic cellulitis, and the temperature rose again to 102°, and continued to show an evening rise to this point for eight days, after which it fell again to normal. The cellulitis was regarded by Sir Halliday Croom as a purely local condition.

On the day following the second intravenous injection intra-uterine douching with eusol was applied, and also on the subsequent day. This was the only other treatment employed to combat the septic condition directly.

REVIEW OF THE CASE.

There seems no reason to doubt that this was a typical case of puerperal septicaemia in the ordinary acceptation of the term, and, further, that there was every likelihood of a fatal result, and this was the opinion of Sir Halliday Croom and other members of the staff. Cultures from the interior of the uterus yielded a *Streptococcus pyogenes* which was fatal to mice. Cultures from the blood, however, were sterile, so that in all probability life was threatened mainly by the toxic effects due to absorption from the local foci.

The immediate effect on the temperature due to the injections of eusol may be regarded as evidence of the action of the hypochlorous acid on the circulating toxin. This view of the case is confirmed by the subsequent temperature disturbance caused by the parametric inflammation.

This case is published at the earliest possible moment because of its bearing on the treatment of septicaemia among the wounded soldiers.

The method is obviously a safe one if carried out with caution and on the lines indicated above.

It has not been possible to determine the maximum quantity of eusol which can be injected with safety into the human subject. Since 100 c.cm. is a small fraction of the blood volume we consider that it is possible where repeated doses are given that this amount might be cautiously increased. On the other hand, to judge from our animal experiments, large amounts may diminish the coagulability of the blood and cause haemolysis.

In a case of malignant endocarditis with pneumonia which is still under treatment we have demonstrated that the 80 to 120 c.cm. eusol can be injected without harm.

The success which has followed the treatment of gas gangrene by local applications of eusol in Captain John Fraser's hands, taken along with the above observations, suggests that the method of intravenous injection may be expected to give favourable results in cases of general septic infection in the field, gas gangrene, tetanus, and other kindred conditions characterized by toxæmia.

This case was under the care of Sir Halliday Croom, and we beg to express our thanks to him for permission to publish an account of the clinical observations.

REFERENCE.

BRITISH MEDICAL JOURNAL, October 9th, 1915.

THE first medical congress of Ecuador, organized by the College of Medicine of Guayaquil, was held in that city from October 9th to the 16th. Among the subjects discussed were the climatic conditions of Ecuador, the special features of typhoid and malarial fevers as seen in various parts of that country, the means of preventing the spread of epidemics, the medical botany of Ecuador, a scheme for the compilation of a *Pharmacopoeia Ecuatoriana*, and the practice of medicine in Ecuador.