plug of omentum, as first recommended by Bennett.² In the rare cases of perforated duodenal ulcer in which invagination is impossible the same method may be employed or the gall-bladder may be stitched over the perforation. If the patient be submitted to operation within a few hours of the perforation all elaborate methods for draining the abdomen with gauze packs, &c., are unnecessary and may be harmful.

The dramatic onset of the illness in these cases rarely leaves any doubt as to the diagnosis; therefore an incision should first be made in the upper part of the abdomen to gain access to the perforation. This should be closed by invagination if possible, and where this is not feasible by an omental plug or stitching to a neighbouring viscus. If there has been much escape of gastric or duodenal content a tube may be inserted into the pelvis through a suprapubic stab-wound and the upper wound closed. If little escape has occurred the peritoneum may be left to look after itself and the abdomen may be completely closed. Such an operation takes no longer than that advocated by Mr. Corner, and the after-treatment of the case is much simpler—an important point where the patient is in a private house or at some distance from the medical man.

I am, Sir, yours faithfully,
Edinburgh, Jan. 12th, 1914. D. P. D. WILKIE.

ANTS AS TRANSMITTERS OF TROPICAL DISEASE.

To the Editor of THE LANCET.

SIR,—The annotation entitled "Ants as Transmitters of Tropical Disease," which appeared in THE LANCET of Jan. 10th, serves a useful purpose in directing attention to a matter which is possibly of very considerable importance, and which until recently had not received the attention it appears to merit. You kindly mention the suggestion I made in 1908 and refer to the interesting work of Dr. Bates on the mechanical transmission of *B. typhosus* and *B. dysenteriae* by a species of large ant in the Canal Zone. I would like to mention that it was Dr. S. T. Darling who re-directed attention to this question, and that Messrs. Bates, Jacob, and Jennings carried out the necessary tests under his direction.

Dr. Darling's paper, which appeared in the Transactions of the Fifteenth International Congress on Hygiene and Demography, is entitled "The Part Played by Flies and other Insects in the Spread of Infectious Diseases in the Tropics, with Special Reference to Ants and to the Transmission of *Tr. Hippicum* by *Musca Domestica*."

I had hoped to carry out at Khartoum experiments on the lines of those conducted by Dr. Bates and his colleagues, but was unable to do so. At the same time I made one observation which is of some interest, and to which I think I once referred at a meeting of the now defunct Society for the Destruction of Vermin. A species of large ant in the Sudan has a great liking for urine. It haunts chamber-pots. This idiosyncrasy is not to be explained by a mere love of fluid, for if urine be allowed to dry in a vessel the ants are almost certainly to be found crawling over the dry uratic deposit which in the tropics so often results. I am inclined to think that urea has a special attraction

for them, though no doubt liquid and moisture also entice them.

This being so, it is possible that in certain cases ants might transmit the *Micrococcus melitensis* in food such as milk or cheese. In the same way *B. typhosus* might be carried from the urine by these insects. It is not very likely that either of these accidents happens in nature, but it is worth while keeping the possibility in mind, for sometimes isolated sporadic cases of undulant fever and enteric fever crop up and are very difficult to explain. In any case, it is to be noted that urine and urinary deposits serve to attract a species of large ant which is very common in Khartoum, but the scientific name of which I have unfortunately forgotten. I am, Sir, yours faithfully,

ANDREW BALFOUR.

Wellcome Bureau of Scientific Research,
Wigmore-street, W., Jan. 13th, 1914.

THYROID SECRETION AND ANTITOXIN.

To the Editor of THE LANCET.

SIR,—In reference to my article entitled "The Relation of the Thyroid to Antitoxin," which appeared in THE LANCET of Dec. 27th, 1913, I am informed by Dr. A. T. MacConkey that he does not use potassium mercuric iodide as an antiseptic, and that as regards the sera supplied by the Lister Institute, any iodine present cannot be accounted for in this way. In the annotation upon the same subject, which appeared in the same issue, "the toxic effects induced in rabbits by injection of antitoxic serum," should read, "the toxic effects induced in rabbits by feeding with antitoxic serum."

I am, Sir, yours faithfully,

RUPERT FARRANT.

Queen Anne-street, Cavendish-square, W., Jan. 7th, 1914.

THE PATHOLOGY OF RHEUMATOID ARTHRITIS.

To the Editor of THE LANCET.

SIR,—I have read with much interest the letter on this subject contributed by Dr. P. W. Latham to THE LANCET of Jan. 10th. In the second column on p. 145 and on p. 146 he expresses his opinion that the presence in the blood and tissues of the "products of imperfect metabolism of muscular and other tissues" "imperfectly excreted" enable micro-organisms otherwise avirulent to become pathogenic, and so cause arthritis. My experience of fibrositis—and peri-arthritis and many conditions at present described as rheumatoid arthritis are forms of fibrositis—has led me to the belief that not only does imperfect elimination of waste matter enable pathogenic organisms to develop and become virulent, but that these materials are sufficiently toxic to be themselves a cause of fibrosis and fibrositis. I have dealt with this in some detail in a paper published in the Transactions of the Royal Society of Medicine (Balneological Section, April, 1913), entitled "Daily Habits in Civilised Life as Factors in the Causation of Fibrositis," and hope with your permission to present certain aspects of it to your readers at an early date. If the view thus expressed is correct, in all conditions of chronic arthritis and fibrositis, and possibly in most diseases of middle and later life, the vitiation of the blood and tissues caused by imperfect elimination of waste products—a condition I have ventured to name "dyscatharsia"—is a very important, if not the most important, factor. In recent years in the study of the seeds of

² THE LANCET, August 1st, 1896.