

is to be given of the diseases attributable to impure water, followed by an account of "germs" and the part they play in the causation of disease. Filters are to be dealt with, also sterilisation and the utilisation of chemicals for the routine purification of water. Arrangements are being made in the Southern Command by officers of the Royal Army Medical Corps to lecture at the more important centres of the Territorial Force.

#### THE SLEEPING SICKNESS COMMISSION.

Captain F. Percival Mackie, I.M.S., has been selected by the Government of India to join the Sleeping Sickness Commission which has recently left England for Uganda under the auspices of the Royal Society and under the direction of Colonel Sir David Bruce, R.A.M.C. Captain Mackie hands over his duties as assistant to the Director, Bombay Bacteriological Laboratory, and joins Sir David Bruce and his party at Mombasa.

#### ROYAL ARMY MEDICAL CORPS EXAMINATION.

An examination of candidates for not fewer than 30 commissions in the Royal Army Medical Corps will be held on Jan. 27th and following days. Application should be made to the Secretary, War Office, London, S.W., not later than Jan. 18th next, on which date the list will be closed. The presence of candidates will be required in London from Jan. 25th.

## Correspondence.

"Audi alteram partem."

### THE CONTAMINATION OF MILK.

To the Editor of THE LANCET.

SIR,—The question of the contamination of milk is one of immense public importance and is now beginning to receive the amount of attention which it deserves. As evidence of this I need only refer to the recent exhaustive report on the subject issued on behalf of the East and West Ridings of Yorkshire, to another important report by the medical officer of health of Chester to which you have devoted a leading article in THE LANCET of Oct. 24th, p. 1226, and also to a notice in the Times of Oct. 26th in reference to the action of the public health committee of the London County Council.

In the very elaborate work on "The Bacteriology of Milk" by Swithinbank and Newman (1903) they say "that there are two rises and two falls in the number of bacteria [in milk], the first being due to extraneous organisms, and the second to lactic acid organisms, "and they believe this" to be the almost universal rule in untreated 'natural' milk" (p. 135). At the first decline "the common extraneous bacteria die out, and that for the very simple reason that they cannot live in the presence of the new tide of acid-forming bacteria." This is said to occur after about 12 hours at temperatures between 60° and 98° F., whilst the second decline begins after six days at 60° and after 72 hours at 98°. As the decline progresses moulds (*Oidium lactis*, &c.) increase, so that ultimately these latter completely replace the bacteria. A similar statement is made by these authorities in reference to the "ripening of cream," concerning which they say (pp. 187-189), "In three or four days the number of organisms [bacteria] found in cream has abated, and eventually nothing remains but *Oidium lactis*, as in milk."

Seeing that these are the natural changes that occur in milk and cream one would expect to find very distinct references in reports on "the contamination of milk" to the presence and abundance therein of spores and conidia of moulds, these being bodies enormously larger than bacteria. Hitherto, however, I have been unable to find any specific statements on this subject, either in the Yorkshire report or even in the important work from which I have quoted, in which the inevitable appearance of moulds is so explicitly stated. This is to me all the more surprising because of certain observations of my own many times repeated during the last eight years. The first and simplest observations were of this nature. Fresh milk from one of the very best London companies was poured into a small one ounce sterilised beaker over which another was inverted. If left at a temperature of about 70° F. a thick layer of cream soon rises to the surface, and when minute portions of this are

examined by the microscope after about 33 hours though myriads of bacteria are to be seen no spores of mould can be detected; but in from 40 to 45 hours I have invariably found conidia of mould together with more or less mycelium infiltrating the layer of cream.

After studying the work of Swithinbank and Newman a few months since and reading the Yorkshire report I have repeated these observations, and carried them much further with the purest milk that I could obtain both from London and the country. The new observations have been of this nature. A shallow Petri dish containing some layers of blotting paper on which a microscope slip was placed was thoroughly sterilised (so that the blotting paper became scorched); and as soon as this had cooled a little some recently boiled distilled water was poured over the blotting paper, and a single drop of fresh milk was placed by means of a sterilised pipette on the centre of the microscope slip. The cover of the Petri dish, which had been thus briefly removed, was then replaced, arrangements having been made that in this damp chamber the cover should come into contact with the drop of milk, which was thus fixed between it and the microscope slip. This arrangement was made because it had been found that conidia of mould always tended to subside to the level of the slip. Therefore, when the cover of the Petri dish was removed for examination of the drop after some days the less important portion of the milk was carried away with it. The application of the cover glass to the slip could then be made and the result of the experiment studied.

What I have invariably found has been this: that in four or five days with a temperature of 70° to 65° F. thousands of torula-like bodies or conidia were to be found among the milk globules and swarms of bacteria. It seems perfectly clear that the milk has to be rendered acid by the swarms of lactic bacteria before the moulds can make their appearance. But we may well ask, Whence come they? Can we believe that the air is so full of the spores or conidia of *Oidium lactis* or other common moulds that in every single drop of the purest and most carefully preserved milks supplied to the public these moulds can be made to make their appearance?

My observations are thoroughly in accord with the statements of Swithinbank and Newman as to the natural changes occurring in milk and cream. Yet the bacteriologists tell us nothing about the prevalence of the conidia of moulds in milk, and although they are so much larger than bacteria they seem almost to elude their observation. I searched carefully for information on this subject in the Yorkshire report and the only definite statement I could find is that made on p. 56, in which Dr. Thomas Orr says in reference to the examination of sediments obtained by the centrifuge from various specimens of milk: "Bacteria were always present and sometimes yeast cells." Surely bacteriologists ought to tell us something more about the invariable appearance of moulds in milk.

I am, Sir, yours faithfully,

H. CHARLTON BASTIAN.

The Athenæum, Pall Mall, S.W., Oct. 26th, 1908.

### ON CHRONIC MORPHINISM AND ITS TREATMENT.

To the Editor of THE LANCET.

SIR,—In THE LANCET of August 15th, p. 439, there appeared what may be termed a "causerie" on the Opium Habit by Sir Dyce Duckworth, characterised, as Professor A. Gamgee in his subsequent paper in THE LANCET of Sept. 12th, p. 794, remarks, by much grace of style, but which, taken as an exposition of the question by a medical teacher, shows conclusively how little the subject is understood in England.

"Sir Dyce Duckworth," says Professor Gamgee, "attempts no analysis of the essential causes, leaves absolutely untouched the nature and the clinical characters of the multiple cravings ..... which are rendered evident by the circulatory, respiratory, digestive, metabolic, and nervous phenomena. .... He ignores the methods by which these distressing symptoms may be combated ..... and he throws the whole weight of his authority" in favour of what Professor Gamgee calls the "extremely vicious" English system, a system which to recommend at the present day, when the morphia habit can be cured without the infliction of suffering, is, as Mr. J. Q. Donald remarks, "almost criminal," and shows either the most unpardonable ignorance or the most surprising inhumanity.