

Lever's product lost much of the preservative on the outer side when exposed on the flat roof of the laboratory during the very wet months January and February. Fishing-nets treated with these soaps should therefore be protected so far as possible from rain; nor does hanging up to dry appear to be necessary, for sunlight is injurious to all fibres, and the copper soaps protect very effectively against rotting. The use of these soaps, mixed with tar for the heavier gear to lessen the rain effect, seems desirable. It may be pointed out that the soaps dissolve only when the nets are in water, but bacterial action goes on so long as the net is damp, so the immersion tests are in this respect unduly severe on the preservative.

The treatment of tent fabrics with copper soaps would appear to be useful in climates where the rainfall is not excessive, but where heavy dews prevail, as in parts of Egypt. In such climates fungal hyphae grow among and inside the cotton fibres and holes appear everywhere. The inner walls of the eastern pattern tents are also attacked.

The decay of mosquito netting in hot damp climates is sometimes a serious matter. Doubtless a dip in a dilute solution of copper soap would prove effective in prolonging the life of this netting. It could also be used for tennis nets and netting round the courts.

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#### Diagnosis of Ankylostomiasis.

LIEUT.-COL. CLAYTON LANE, in *NATURE* of March 28, p. 478, criticised the modified floatation method adopted in Egypt for the diagnosis of ankylostomiasis. The principal modification lies in using a conical Erlenmeyer flask to hold the faecal emulsion in concentrated salt solution. This enabled the use of a large amount of fluid (100 c.c.), while the surface film does not exceed 1 cm. in diameter. Apparently Lieut.-Col. Lane did not give this method a trial, but applied to it the results he previously found in using an inverted metal cone.

Any trustworthy method for the diagnosis of ankylostomiasis intended for extensive campaigns should (1) be delicate enough to detect infection with one couple of worms of which one is a normally ovipositing female, (2) be simple and practical, and (3) not be time-consuming. It is not essential that the method should ensure the concentration in the surface film of the highest percentage of ova present in 1 c.c. of the stool so long as enough ova are present to ensure diagnosis. The examination is discontinued once a single ovum is detected.

If we accept Lane's statement, although it was not proved, that this method detects 7 per cent. of the total number of ova, and if we accept Stoll's result that a single fertilised female lays 44 ova per c.c. of the stool, we find that the method fulfils the requirements mentioned above, especially as the ova are unmasked and easily detected in films prepared by this method. Lane's results regarding the concentration of the ova, and Stoll's counts as regards the number of ova laid by a single female, have not yet been confirmed by other investigators. In view of this uncertainty, the anthelmintic (carbon tetrachloride) is administered to all patients attending the Ankylostomiasis and Bilharziasis Hospitals in Egypt since January 1924, regardless of the results of the microscopical examination. Re-examination after the first treatment is restricted to those in whose faeces ova were detected on the first examination.

In addition to the floatation method, a faecal smear is examined from every case in order to detect bilharzia ova, and incidentally ankylostoma ova. It

has been found that on an average 30 per cent. of the positive cases for ankylostoma are detected by floatation and missed in the smear. During re-examination after the first treatment, 90 per cent. of the positive cases are missed in the smear and detected by floatation.

Lane mentions as a proof of the inaccuracy of the method that in an Egyptian village in the Delta (Saft el Enab) only 16.6 per cent. were found to be infected with ankylostoma, while 40,000 examinations by the smear or centrifugal method showed an infection percentage in different parts of Lower Egypt of 48 to 97 per cent. I am unaware of the source from which he got his figures as regards the 40,000 examinations. I may, however, mention that the degree of infection in the Delta varies considerably. Using the technique mentioned above, it was found that in villages in the neighbourhood of Cairo the infection may be so high as 88 per cent., in the neighbourhood of Benha 60 per cent., in the neighbourhood of Mansura 34 per cent., in the neighbourhood of Dessuk 16 per cent. The percentage of infection diminishes as we travel northwards. It is probable that atmospheric temperature influences the incidence of infection in these different localities. This subject is being studied at present. The Delta of Egypt is a large territory, and it is inaccurate to treat it as a whole as regards the incidence of ankylostomiasis.

As regards the importance of accurate study of ankylostomiasis from its various aspects in Egypt, I may assure Lieut.-Col. Lane that the Egyptian Government is fully alive to its responsibility. It had already started, towards the end of 1922, a research section devoted to the study of ankylostomiasis and bilharziasis.

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THE community percentages of hookworm infection for Egypt of 48 to 97 obtained by the use of Howard's, the least efficient concentrative diagnostic technique, emerge from analysis of Khalil's tables. A percentage of 16.6 for his floatation method indicates then either an unluckily chosen experimental site or an undependable technique. It was held that the evidence suggested that the latter factor was involved. This conclusion would indeed seem to be Khalil's also, since he writes: "It is probable that some of my negative results were due to the very few ova which escaped the attention of the examiner" (p. 82). Put otherwise, his first requisite for a trustworthy diagnosis—namely, that the technique must be "delicate enough to detect infection with one couple of worms of which one is a normally ovipositing female"—is an ideal which he seemingly holds unattained by his own technique.

But the fundamental point in the criticism lay in that, being without knowledge of the number of ova with which, in any instance, his technique started, he necessarily remained ignorant of the percentage which it finally delivered. The later statement, that it is better than the worst concentrative technique, does not even now rectify the matter. Its real value can only be indicated by such methods of control as are being applied in various parts of the world, already with a considerable measure of success. Without a controlled, and therefore scientific, basis for the work, the Egyptian campaign, so heavily subsidised by the Rockefeller Foundation—at the expense of which so much of the recent widespread experimental work on control has been carried out—must clearly remain of minor value.

CLAYTON LANE.