spondence of the symptoms noted above, with accounts published in the BRITISH MEDICAL JOURNAL for Indian phlebotomus, is at once striking and interesting for one without previous experience of this widely-distributed infection.

THE TEMPERATURE NECESSARY FOR THE DESTRUCTION OF LICE AND THEIR EGGS.

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THE points concerning temperature dealt with by Dr. Kinloch in his valuable contribution on lice, published in your issue of June 19th, 1915, were so at variance with my experience regarding the heat necessary to kill other insects that I felt impelled to test the matter for myself.

Bugs (*Cimex lectularius*) have been shown by Blacklock (1912) to die at 45° C. (113° F.); subsequent experiments by myself (1914) confirm this, and also show that fleas (*Xenopsylla cheopis*) and cockroaches (*Periplaneta americana*) are destroyed at this temperature, or a few degrees higher. Reports of experiments with mosquitos (*Stegomyia fasciata*), performed under the auspices of the Yellow Fever Commission (West Africa), now in course of publication, show that about the same degree of heat is also critical for these insects.

Living specimens of lice—*Pediculus humanis (vestimenti)*—were obtained from two separate sources and treated as a single stock, from which the active insects and nits required for the following experiments were drawn. The breeding method adopted was to line an entomological glass-bottomed box with a slip of dark-coloured cloth and cover the top with chiffon,* through which the insects were fed. This box was nested in one of a larger size for safety and carried in a pocket where the insects had the advantage of the natural heat and humidity of the body.

The method used in the tests was as follows: Pieces of cloth with eggs and active lice on them, or with one or the other only, were taken from the stock box and divided, one portion being kept as a control, the other used for the test. If active lice were present, the piece of cloth was placed in a similar box, covered with chiffon, but if the nits only were tested the cover was not used.

It was found that both the eggs and lice (in their second instar) survived a thirty minutes' trial in an incubator (dry air) at 49° C. (120.2° F.), the lice being apparently unaffected, as they subsequently completed their development. Living lice, however, were killed by thirty minutes' submersion in water at 50.2° C. (122.3° F.); at the same temperature in dry air they were paralysed and rendered incapable of other movements than a feeble motion of the legs; 28 out of 32 specimens in all stages of growth died within a few hours, but 4 (two in the second and two in the third instars) survived.

Another trial was carried out at 54° C. (129.2° F.). Thirty-five minutes after the lice were placed in the incubator they were all dead, and, up to the time of writing—over three weeks after the test—no young have emerged from the eggs submitted to this temperature, though the control box is swarming with lice in all stages of growth.

Eggs on pieces of cloth were dipped into water boiling at 98.4° C. (209.1° F.) for one minute and a half-minute respectively, and, as was to be expected, they turned opaque white, presumably owing to the coagulation of the albumin. They were, however, kept in entomological boxes and carried in the same pocket as the control eggs; these latter duly hatched, but the tested eggs shrivelled up after drying.

A further test was carried out in a water bath to ensure greater accuracy. One batch of eggs was placed in tap water in a tube, stoppered with cotton-wool, and another portion of the same batch of eggs was placed dry in a similar tube; both the tubes were submerged to within an inch of the rim in the water bath, the registered temperature of which was 55° C. (131° F.). After thirty minutes the eggs were removed and placed in separate boxes, the

control portion being placed in a third. All three boxes were kept together in the same pocket. Up to the time of writing (sixteen days after the trial) no eggs have hatched in either of the test boxes, while many active lice in various stages of growth are present in the control box.

While it is, of course, possible that eggs having a long hatching period may survive a temperature which kills those which develop more rapidly, it is so improbable that I have no hesitation in concluding that dry heat or submersion in water at 55° C. (131° F.) kills both active lice and their eggs. It follows as a consequence that considerably lower temperatures than those usually employed may be used to destroy these vermin. For the thorough sterilization of infested garments the question of penetration is all-important. It is probable that considerable economy in fuel might be effected by allowing a longer exposure at a lower temperature, while it should be practicable to use quite lightly built chambers or temporarily adapted rooms to obtain dry air temperatures of, say, 60° C. (140° F.)

REFERENCES.

Bacot, *Bull. of Ento. Research*, vol. v, pp. 111-117, September, 1914. Blacklock, *Annals of Tropical Medicine and Parasitology*, vol. vi, pp. 415-428, December, 1912. Kinloch, *BRITISH MEDICAL JOURNAL*, June 19th, 1915, pp. 1038-1041.

Memoranda:

MEDICAL, SURGICAL, OBSTETRICAL.

CREOSOTE IN RHEUMATISM AND GOUT.

OWING to the great rise in price of acetyl salicylic acid and sodium salicylate, I made a trial as a substitute of creosote in $\frac{1}{2}$ -minim doses given in the form of a mixture, as follows: Magnesium carbonate (heavy), 3j; creosote, viij min.; peppermint water to viij fl. oz. The dose for an adult is one tablespoonful every four hours, with an equal quantity of water.

If pain is severe, the addition of from five to seven minims of liquid extract of opium to each dose is valuable; and when the pain is due to acute gout, the further addition of from seven to ten grains of potassium bicarbonate is also good. In cases of arthritis, associated with great loss of lime salts, prepared chalk (ten grains), or aromatic chalk powder (ten to fifteen grains), may be added with good results.

I have found that cases of acute gout treated on these lines, combined with suitable local treatment, are rapidly relieved, the patient being able to return to his work in less time than before, whilst the interval between the attacks seems to be lengthened.

In cases of catarrh and influenza, with feverishness, it is a good plan sometimes to substitute for the peppermint water solution of acetanilide (2½ grains to the ounce), made previously with boiling water and cooled—the flavouring being made by essence of peppermint.

Cases of lumbago, sciatica, fibrositis, neuritis and arthritis of various types, seem to do quite as well with the creosote treatment as with the salicylic, and one decided advantage is the absence of severe gastric disturbance associated with the use of acetyl salicylic acid in some cases, as shown by anorexia and nausea. In fact, the creosote mixture (modified if necessary to suit individual cases) is of use in gastric and intestinal disorders, and replaces bismuth salicylate very well in some cases.

For patients unable to tolerate the smell or flavour of creosote, as well as for other cases, the substitution of sodium sulpho-carbolate gives good result.

I send these suggestions in the hope that they may help to cut down expenses in panel and dispensing practice, and to obviate the difficulty in obtaining a sufficient supply of the salicylic compounds.

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DYSTOCIA DUE TO CONSTRICTED OS.

HERMAN, in his valuable work on difficult labour, refers to dystocia due to the very rare condition of smallness of the os externum, and the following case is recorded on this account:

A young woman had suffered from procidentia uteri; the uterus had been ventro-fixed by operation, but the procidentia thereafter completely recurred. She became

* This method is fully explained in A Study of the Bionomics of the Common Rat-flea and other Species associated with Human Habitations, etc., *Journal of Hygiene*, Plague Supplement III, January 14th, 1914, p. 465.