THE UNRELIABILITY OF SULPHUR FOR THE DESTRUCTION OF LICE IN CLOTHING.

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The trials forming the basis of this note were undertaken at the request of Admiral Henderson, of the Metropolitan Asylums Board, with a view to testing the efficiency of a process of fumigation as applied in the London Borough casual wards. Since the experiments aimed at showing the results of the method as normally employed, and were in no way directed to prove that "sulphur vapour" will, under certain conditions, destroy lice, no efforts were made to produce an unusually high concentration of gas.

I wish to acknowledge my indebtedness to Captain J. T. Grant, R.A.M.C., for his assistance and collaboration in regard to the preliminary arrangement and conduct of these trials, and to Mr. J. B. Reid, superintendent of the St. Pancras Casual Ward, for his co-operation, and the care with which he conducted the exposures on the lines normally worked. In publishing these results my desire is to bring to the notice of the medical officers of health and sanitary officials throughout the country the unreliability of the use of sulphur for the purpose in question under the method employed.

Fumigation Chamber.

The fumigation chamber in which the trials were conducted has a cubic capacity of 294 ft. (7 ft. long, 6 ft. wide, and 7 ft. high). The floor is concrete, the walls brick, and the ceiling wood covered with zinc. The chamber is entirely without ventilation, there being neither window nor chimney, so that there is no passage for the escape of the gas generated when the door is closed.

Method of Use.

After the infested clothing has been hung in the chamber two pails are placed on the floor, one containing boiling water and the other, put close to it, a shovel full of live fire, on which 1 lb. of sulphur is placed. The door is then closed, and the clothes are left exposed to the vapour given off by the boiling water and sulphur until next morning—the usual period being about nine hours. In the trials as recorded below the normal procedure for the use of the chamber in practice was followed. In addition the temperature was taken with a registering thermometer placed in one or other corner of the chamber at the level of one or more of the pockets in which the lice and nits were exposed.

Lice and nits on small slips of army shirt flannel were placed in small pockets of khaki cloth made by folding a slip over and stitching the edges together, the idea being to afford the insects and their eggs as much protection as they could attain by crawling into the complex seams situated at the fork of trousers, or the junction of sleeves with the body of a tunic or coat. Each pocket contained 100 to 300 nits, and in all but the fifth trial 10 to 12 active lice as well. In each of the five trials five pockets were used, four being exposed in the chamber, the fifth being used as a control. Particular care was taken to ensure that nits of all ages, from those freshly laid to those about to hatch, were present. After exposure a careful examination was made in respect of the active lice. The nits were transferred to small card boxes placed in a bag suspended between shirt and skin, so as to give them as natural a condition as possible during incubation.

Details of Experiments.

First Trial.—Pockets 1, 2, 3, 4 were exposed at the height of 2, 3, 4, and 5 feet from the floor respectively; temperature 92° F.; period nine hours. In all four pockets the lice and nits were killed. In pocket No. 5 (control) the lice were living and the nits hatched freely.

Second Trial.—Exposure at 2 ft. from the floor; temperature 92° F.; period nine hours. In none of the four pockets were the lice killed. Nits hatched freely; over 100 were counted in most cases before they were placed in the stock boxes as normal hatches. In the control pocket the lice were living and the nits hatched normally.

Third Trial.—Exposure at 3 ft. from the floor; temperature 90° F.; period nine hours. In none of the four pockets were the lice killed. Hatching was somewhat delayed in relation to the controls, but the young lice emerged in large numbers; it is

doubtful if the exposure to the vapour caused any mortality at all. In the control pocket also the lice were not killed; the nits hatched normally.

Fourth Trial.—Four pockets were exposed at 4 ft. from the floor; temperature 88° F.; period nine hours. (Pocket No. 3 was left open; there was no control pocket.) Some active lice survived in each pocket, but others were killed. The nits hatched very freely; a few of the recently laid eggs failed to hatch, presumably owing to the exposure, but the bulk hatched normally.

Fifth Trial.—Exposure at 3 ft. from the floor; temperature 95° F.; period nine hours. (In this trial all the pockets were left unstitched along one side and during the exposure they were held open by a small piece of wood.) In pockets 1, 2, 3, 4 there were no active lice present; the great majority of the nits were killed, but a few—two or three—hatched in each pocket. In the control pocket no active lice were present; nits hatched normally.

Comments.

No definite reason can be adduced for the success of the first trial in contrast to the failure of the subsequent ones. Previous experiments have shown that in cases where "sulphur vapour" is effective a few nits may hatch at a somewhat later date than the unexposed eggs of the control. The suggestion obtained from the evidence is that this may result because eggs at a certain age (stage of development) are relatively immune as compared with others. It is not feasible, however, to explain diverging results of such magnitude as the above in such a way. It is more reasonable to suppose that, owing to some variation in the heat of the live coal, the sulphur burned more rapidly in the first trial and so produced a higher concentration of gas, for it seems possible, if not probable, that quick combustion is more effective than slow combustion continued over a longer period.

The opening of the pockets in the fifth series of trials was carried out in deference to a criticism to the effect that the method of protecting the nits and lice by one thickness of khaki cloth was too severe a test. It is probable that the largely increased success attained in these trials was due, in part at any rate, to the fuller exposure. As, however, nits are frequently laid in the seams at the fork or armpit, in some of which they will get protection even if others gape as a result of the clothing being turned inside out, reliance upon any process which depends for its success upon the full exposure of all the nits is to be deprecated.

I suggest reliance upon heat wherever possible for the destruction of insect vermin, half an hour's exposure to a temperature of 55° C. being amply sufficient with either dry or moist heat, provided the clothing or other articles are suspended, and not bundled.

Memoranda:

MEDICAL, SURGICAL, OBSTETRICAL.

THE TREATMENT OF PNEUMONIA.

AFTER reading the two articles in the JOURNAL of October 19th, pp. 427-8, on the treatment of lobar pneumonia, I feel impelled to write this note.

Some six or eight years ago I read a letter in the JOURNAL in which the writer stated that, although he had treated a large number of cases of pneumonia, he had not had a single death for something like ten years. He gave a prescription of the medicine he employed, which I reproduce at the end of this letter.

My partner (Dr. Gerrard) and I adopted this method of treatment at the time, and, with one exception, have not had a fatal case. The man who died—for reasons which it is unnecessary to state—was not given this particular treatment. Over and over again we have been amazed at the results obtained. I cannot do better than give a brief outline of the last case I have had, which is typical of a large number.

On the forenoon of September 23rd I was called in to see a sailor, aged 20, home on leave, having just returned with a convoy from America. I was told he had had a rigor on the previous afternoon, a restless night, and had been slightly delirious.

I found him suffering from acute lobar pneumonia, as evidenced by frequent cough, slightly blood-stained sputum, and well marked crepitation over a pretty extensive area at the base of the left lung. Temperature 104°, pulse and respiration I do not remember. He began to take the medicine about 4 p.m.