

Marine (1899) Department.

G.O., No. 760 Marine

DATED 10th Aug. 1899.

N 77
80722/99

[Despatch Abstract.]

Disinfection - Pro. Doct. Min. Dept.

Coming to all offices concerned, a memo:
by the Sanitary Commissioner with the Govt.
of India containing simple rules re - of
houses & clothing intended for the guidance of
non-professional persons, commd to the P.O.
& the Chairman S.T.Bd

[M.-6.
260-27-4-99.]

Indexed.

17/8/99

GOVERNMENT OF MADRAS.

LOCAL AND MUNICIPAL DEPARTMENT.

READ—the following paper:—

From A. H. L. FRASER, Esq., C.S.I., Officiating Secretary to the Government of India, Home Department (Sanitary—Plague), to the Secretary to the Government of Madras, Local and Municipal Department, dated Simla, 4th July 1899, No. 2115.

I am directed to address you on the subject of the disinfection of houses and clothing as a precaution against plague. The Government of India attach the utmost importance to the perfection of the system of disinfection, for any flaw in it may render nugatory carefully devised and executed operations against plague. It has been brought to the notice of the Government of India that disinfection is, as a matter of fact, sometimes carried out in an imperfect way, and they believe that this is partly due to want of knowledge of the best methods and the principles underlying them. The Governor-General in Council has, therefore, caused the Sanitary Commissioner with the Government of India to draw up a memorandum (copy enclosed) of simple rules for the guidance of non-professional persons. I am to request that, with the permission of the Governor in Council, the memorandum may be widely circulated with a direction that the advice and instructions it contains should be carefully followed.

ORDER—No. 1154 P., dated 27th July 1899.

Communicated to all Collectors and the President, Municipal Commission, Madras, for information and guidance.

2. The memorandum will be published in the Fort St. George and all District Gazettes.

(True Extract.)

J. H. L.
for Ag. Secretary to Government.

To all Collectors (A, F).
„ the President, Municipal Commission, Madras.
„ the Marine Department.
„ the Sanitary Commissioner.
„ the Surgeon-General.
„ the Superintendent, Government Press.
„ the Deputy Adjutant-General, Madras Command.
„ General Officers Commanding Districts.
Gazette.

Exd. C. Parthasarathy.

1. It has been brought to the notice of the Government of India that the disinfection of plague-infected houses and clothing is often carried out in an imperfect way. In most cases this depends upon the lack of proper appliances and of skilled workmen, but occasionally it seems to be due to incomplete acquaintance with the principles that underlie the art of disinfection. This is, to some extent, inevitable where much of the agency is directed by non-professional persons, and it has been considered advisable to review for the guidance of those concerned the general principles on which disinfection should be carried out.

2. The purpose of disinfection is the destruction of the specific germs of disease. In the case of plague, the germ, in any stage in which it has been hitherto found, is fortunately easy to destroy, if it is reached by the means used for its destruction. The germs of plague may be killed by means of—

(a) moist heat,

(b) chemicals.

Without undervaluing the great efficacy of direct sunlight and ventilation, it may at once be stated that these agents should be used as aids only.

3. Moist heat is most effectively employed in one of the numerous apparatus specially devised for the purpose. All these apparatus are not of equal value; but the three essential conditions in determining whether an apparatus is efficient or not are (1) that the steam employed shall be saturated; (2) that the temperature of the steam shall reach 212°F. or more; and (3) that articles suitable for disinfection by moist heat shall not be spoiled during the process.

4. Special apparatus should be available at all ports and in large cities. Efficient disinfectors can sometimes be extemporised, especially on lines of railway where steam from locomotives can be provided, but it must be ascertained that all such contrivances fulfil the three conditions mentioned above.

Every disinfecter must be worked by a trustworthy man who understands it, the workman having been instructed in the use of the particular apparatus by a medical officer who has ascertained experimentally how to get effective work from it, and has laid down definite rules for the guidance of the operator.

5. But expensive disinfectors are not always available, and a boiler of some kind must often be used. Even in such cases, rules for the guidance of the men using

the boiler must be prescribed. It is less difficult to secure a high and uniform temperature when the vessel used can be covered, and it must not be forgotten that the temperature of the water will be lowered whenever a fresh article is plunged into it. It is essential, then, that arrangements should be made to secure that every article to be disinfected by boiling should be completely immersed, and exposed to the boiling temperature for not less than ten minutes.

6. Chemicals must be used when the employment of moist heat is impossible; and it is well to add that there is at any rate a theoretical objection to the use of chemicals for the disinfection of organic matter such as clothing, because albuminous substances may combine with the chemicals, and form a protecting envelope to the germs it is desired to reach.

7. It is of the first importance that the chemicals should be sufficiently pure to be effective, and although it is impossible here to discuss more than two of the disinfectants in most general use,—perchloride of mercury and carbolic acid, it may be remarked that a sample of "crude perchloride of mercury" recently purchased in Calcutta contained no perchloride at all, and that much of the commercial carbolic acid in general use contains very little phenol and very much comparatively inert tar oils.

To secure the purity of the chemicals, it would be of advantage to issue them from a depôt or depôts in each province.

In any case chemicals should be tested before being taken into use, and for this purpose specimens should be sent to the Chemical Examiner for report as to whether they are sufficiently pure to be efficient. Where it is not possible to obtain the assistance of the Chemical Examiner, the following rough tests may be employed, as they require for their performance no special apparatus except a few test-tubes with corks to fit them, and a 9 per cent. solution of caustic soda.

Perchloride of mercury should be of a white or glassy colour; heated on an iron spoon over a flame it should disappear without leaving more than a trace of residue. It is soluble in 16 parts of cold water—60° F.

The impurity most likely to be present is calomel, which is insoluble in water.

Take a little of the 'perchloride' to be examined, powder it, place it in a test-tube and add pure water. Shake and pour off the clear fluid into a second test-tube. The

clear fluid should contain the perchloride of mercury. Add some of the caustic soda solution to it, a yellow precipitate indicates perchloride of mercury.

If any salt is left in the bottom of the original test-tube, a little of the caustic soda solution should be poured on it. Blackening indicates the presence of calomel.

The examination of the *carbolic acid* is less satisfactory. A long test-tube should be taken and sufficient of the carbolic acid poured into it to fill it for 1½ inches. Twice the quantity of the 9 per cent. solution of caustic soda should then be added to fill the test-tube up to 4½ inches. The tube should then be corked, well shaken, and the contents allowed ample time to settle. If tar oils are present, they will separate in a dark layer, and if this layer measures more than ¼ of an inch in the test-tube, the carbolic acid contains too much tar oil to be efficient.

8. The strength of the disinfecting perchloride solution should be 1 in 1,000 with the addition of 2 per thousand of hydrochloric acid, and a little aniline blue or other colouring matter. The solution of perchloride of mercury should be prepared in concentrated form, and specific directions should be given on the label of the vessel containing it to show the amount of the concentrated preparation necessary to make a solution of 1 part of perchloride in 1,000 in strength, on the addition of one gallon, or other convenient quantity, of water. But care must be taken that the proper dilution is always observed, and that the solution is not stored in a porous receptacle or brought into contact with metal.

9. The carbolic acid disinfecting solution should contain at least 5 per cent. of phenol; consequently, if the examination has shown that the carbolic acid supplied is of doubtful quality, the dilution with water should be 1 in 18 or 19, instead of 1 in 20.

10. Disinfection may be naturally divided under three headings—

Disinfection of houses and household effects.

Disinfection of personal effects.

Disinfection of the person.

11. A. *Of houses.*—On opening the house a stream of the perchloride solution should be poured by means of a syringe through the door over the furniture and as much of the walls as can be seen from the door. This lays the dust and renders entry to the house comparatively safe. The house may then be entered and the walls, ceiling and everything within reach

thoroughly covered with the perchloride solution till they are wet and dripping. The furniture should be collected in one place and thoroughly disinfected, piece by piece, by means of the solution. Clothing should be collected, placed in a canvas bag sealed with a lead clamp seal and sent to be disinfected by moist heat—by steam if there is an apparatus, if not by boiling. Worthless articles should be burned at once.

After thorough disinfection of the furniture, it should be placed outside to dry in the sunshine.

Each room, passage, staircase, etc., should be systematically cleansed in the same way.

There may be certain parts of a room that require special treatment.

If the floor is of earth, it should not be dug up, but should be thoroughly saturated with the perchloride solution.

If the floor is of earth mixed with cow-dung, it should be saturated with acid perchloride solution of double strength, *i.e.*, 2 per 1,000 of perchloride and 4 per 1,000 hydrochloric acid.

Sometimes wooden and stone walls or articles of furniture are covered with a greasy coat of dirt, through which no solution will penetrate. After such a coating has been thoroughly irrigated with the perchloride solution, it should be scrubbed with a hot 5 per cent. solution of carbolic acid and soft soap.

All crevices and cracks should be thoroughly syringed out with the perchloride solution.

When the rooms and furniture have been disinfected in this way, it is generally advisable to open the roof of the house to admit sunlight and air. For this purpose holes, not less than six feet by four feet, should be made in the roof, care being taken that no beam runs across the opening. Sometimes it may be necessary to remove the whole roof.

Next day the house should be white-washed. For this purpose fresh lime—preferably stone lime and not *kankar* lime—must be used. The fresh lime should be added gradually to water placed in convenient vessels until a hot, caustic wash is obtained, and this should be applied at once over walls, ceiling, floor and doors.

12. The disinfection of a house is always attended by danger, but this may be minimised by suitable precautions.

(a) Disinfecting gangs should be inspected daily, and no one who has any

cut or abrasion of the skin should be allowed to go out with the gang.

(b) Shoes should always be worn inside infected houses.

(c) Workmen should, if possible, have special clothing to wear while disinfecting, and this should be taken off at night and the body cleansed with water.

(d) Each workman should be warned of the danger of inhaling dust and enjoined to avoid raising it, to wrap a fold of his puggie round his mouth when entering a house, and to lay the dust by means of the perchloride spray as soon as possible.

(e) The hands of workmen should be protected from the effects of the carbolic solution and lime wash by the plentiful application of oil.

(f) Whenever they stop working, the workmen should wash their hands thoroughly outside the infected locality.

(g) No food or drink should ever be taken within an infected place, and hookah-smoking in such a place should be prevented.

13. B. *Clothing, etc.*—The disinfection of clothing should be carried out by means of moist heat, either in an apparatus specially constructed for the purpose or in a boiler as described in paragraph 5. When a boiler is used, care must be taken that each article is exposed throughout for at least ten minutes to water at a temperature of 212° F.

Leather and other articles which would be damaged by exposure to moist heat, must be immersed in a disinfecting solution, or thoroughly scrubbed with 5 per cent. carbolic acid solution and soft soap.

14. C. *The person.*—For disinfection of the person reliance must be placed upon soap and warm water, but there is no objection to the additional use of any weak disinfectant which will not injure the skin.