DISINFECTION IN CITIES.

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As our time is very limited, I shall only presume to consider one phase of this subject, namely: That relating to the disinfection of houses for contagious diseases.

In cities, the most unsatisfactory conditions are found. The buildings are not isolated; they are crowded together in the most irregular manner. The construction, in many cases, is very poor, making it very difficult to confine the vapors used in fumigation to the rooms under treatment, or to any particular part of the building.

People in cities do not have as much sympathy from their neighbors as in the country, consequently, during sickness they have no place to go and it frequently happens that they are obliged to walk about the streets until their dwelling rooms are disinfected, and they can return to them. Because of this fact the rooms must be returned as quickly as possible to the tenants and must be in such condition that they can be used during the preparation of the evening meal and for sleeping.

It has been found that practically a limit of from four to five hours is placed upon actual time of treatment of rooms. Under these conditions any method that is used must be capable of fulfilling the following requirements: First, the method must be efficient; second, it must be one that can be easily applied; third, it must be as little injurious to those conducting the disinfection and to the occupants of the rooms as possible; fourth, is must be reasonably cheap.

In the disinfection work of the Chicago Health Department various methods proposed have been industriously studied, and it must be said that it has been most difficult to decide upon a method which will fulfill the requirements and meet the conditions as found. From the first introduction of formaldehyde it was especially desired to use this method, because its efficiency seemed so certain. A long series of experiments with various methods of utilizing formaldehyde was conducted, but, chiefly because of difficulties with the apparatus used in its production, none was found which was entirely satisfactory.

At this time I desire to call attention to a method of using formaldehyde that was adopted by the department in March last and which, because of its simplicity and the results so far obtained, seem to warrant its continued use. No special claims are made for it, but it has
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been so far demonstrated that the results are equal to those where other methods are employed and more quickly and with less difficulty in the manipulations.

The origin of this method was in the well-known fact that cultures of bacteria can be destroyed by placing a few drops of formaldehyde solution upon the cotton plugs used to close the test tubes containing such cultures. Following out this hint, a series of experiments was made, using various sized bell-jars in which cultures were placed, and formaldehyde was evolved by placing varying numbers of drops of formalin upon pieces of cloth suspended in the air space within. It was found that these cultures were killed in much the same manner as were those where the formalin was placed upon the cotton plug. On the same general plan rooms were then treated and the method as now used was thus developed.

The method is briefly as follows: The room is sealed as usual. Several sheets are hung up in the room upon lines stretched across it. These sheets are sprinkled with the forty per cent. solution. The sprinkling is so made that the sheet is covered as evenly as possible with small drops of the solution, separate and distinct from one another. For the purpose of sprinkling, an apparatus similar to a wash-bottle is used. This has a rubber hand-bulb for furnishing the compressed air; the outlet tube has a rose-sprinkler, with a number of very fine openings. The spray is thrown against the sheet only once—the surface is not gone over a second time. The amount of formaldehyde solution used is not less than one hundred and fifty cubic centimetres per thousand cubic feet. This amount is used because of the experiments of Pfuhl, which show that thirty grammes of available formaldehyde to the thousand cubic feet must be present in order to obtain the killing of bacteria. The time of exposure is not less than four hours and as much longer as the conditions will allow.

Repeated tests with cultures exposed in rooms fumigated in this manner have shown that freely exposed organisms—diphtheria, typhoid and pus cocci—are uniformly killed within the given time, and penetration through one thickness of a sheet or blanket has been regularly demonstrated.

Further disinfection of mattresses and bedding is carried out either by means of the steam van or by sprinkling them with formalin solution and piling them together, so that the vapors may penetrate throughout the mass and reach all parts of it, while the disinfection of the air is in progress.

Finally, in the disinfection of such rooms a combination of methods must be used. Upon the one hand the air space and the exposed
surfaces should be treated by the gaseous method, which may be considered efficient when it will kill bacteria upon exposed surfaces and with some penetration. Bulky objects, requiring deeper penetration, must be sterilized by some special process in which the period of time can be increased and the amount of the germicidal agent used can be more carefully controlled, and certain articles may be treated by immersion in antiseptic and disinfectant solutions.