

Here we have it all in a nutshell. Suspended matter must be first removed before it is practical to sterilize water with any degree of efficiency. Removal of suspended matter can only be obtained by sedimentation in storage with or without coagulants or by straining through filters.

We are constantly being asked the question: "Which is the best, ozone treatment or filtration?" Our answer is, without doubt the first duty of any municipality is to provide efficient filtration of water first, and if sterilization is required as an extra safeguard, only then can it be considered as a method of further treating the filtered water to kill off, if possible, any of the few bacteria remaining.

AUTUMN AND TYPHOID.

The autumn and early winter seasons are more associated with typhoid epidemics than any part of the rest of the year.

Typhoid in many places is practically endemic; that is, the germ of infection is always present. Given the suitable conditions for the spread of the germs, the disease, if not closely watched and guarded by quarantine laws, becomes epidemic.

It may be possible in some instances to determine the cause of the beginning of an epidemic, by means of milk or water coming in contact with excreta, or some other defined cause. The continuation of an epidemic is generally due to want of care in isolating a patient, and a lack of knowledge of the proper precautions to take in preventing the spread of infection.

A list of instructions issued by the Saskatchewan Government for the public guidance in the form of a leaflet is well worth consideration and practical attention:—

Instructions in Cases of Typhoid.

1. Typhoid fever is contracted solely by the mouth. If you do not put the poison of typhoid fever into your mouth you will never contract typhoid fever. Therefore, watch the mouth.

2. Do not eat or drink anything (water, milk, oysters, fresh vegetables or anything else) unless it has been first boiled, broiled, baked, roasted, fried or otherwise thoroughly heated through and through.

3. Do without all food or drink which has not first thus been heated. (Canned or bottled foods or drinks, other than milk or water, are not included in this.)

4. If living in the same house with a typhoid fever patient, do not handle your own food, or food intended for anyone else, even if it has been heated, except with hands that have been thoroughly washed with soap and very hot water. (Preferably also with antiseptics—ask your physician about the antiseptic to use.) Wash before every meal in this way and before cooking, serving or eating anything or putting the fingers in the mouth.

5. If there are flies about, see that all food and drink is protected from them at all times. Flies often carry typhoid poison to foods and drinks.

6. The poison of typhoid fever does not show itself for two weeks after it enters the body. Therefore, for the next two weeks typhoid cases may develop from typhoid poison already taken in. But any case which develops on or after.....will be due solely to neglect of this notice and failure to carry out minutely the directions here given.

SEWAGE DISPOSAL.

Removal of Putrescibility.*

Chapter VII.

Percolating Filters.

In the issue of September 24th, it was concluded that certain points must be observed in order to obtain the maximum efficiency in purification of sewage by means of percolating filters.

The points noted were:—

(a) Even distribution of the sewage over the whole surface of the filter.

(b) That the sewage be not presented in the form of bulk, but broken up into drops or spray.

(c) The porosity be of open character, that the drops of sewage will not fill the pores to the exclusion of air.

(d) That the passage of the drops of sewage through the filter be sufficiently slow, to give ample time for the absorption film to extract from each drop of sewage, the organic impurities contained.

(e) That the liquid supplied to the filter never be under pressure, beyond the gravity inherent to each independent drop, so that there is no flushing of the filter.

We will now proceed to deal with the above points in the order named, and leave the important subject of the effect of frost and protection from frost for subsequent consideration.

Even Distribution.

Under this heading the points (a) and (b) will be dealt with together.

It has been previously pointed out that the contact bed was the result of an effort to get over the difficulty of even distribution. Even distribution was obtained by filling the contact bed to the point of saturation, that is the sewage was presented in the form of bulk to the exclusion of air. This produced conditions unfavorable to nitrification, air being necessary to this fermentative process.

A number of devices have been brought out with a view to solving the difficulty of even distribution, combined with the view of presenting the sewage in the forms of drops or spray. Generally speaking, these devices partake of two forms, either as fixed sprays, or revolving sprinklers.

Outside these two main divisions, sewage has, on a small scale, been distributed by means of perforated corrugated iron troughs, and by means of automatic tipping tanks. In the latter connection, the Fifth Report of the Royal Commission on Sewage Disposal states, "Tipping troughs and dripping trays are, in our opinion, more suitable for small

*These articles are specially prepared for this Review by Mr. T. Aird Murray, Consulting Engineer, Toronto.