THE
Sanitary Review
SEWERAGE, SEWAGE DISPOSAL, WATER SUPPLY AND WATER PURIFICATION

THE DISINFECTION OF TORONTO'S WATER SUPPLY.

For nearly three weeks past the city of Toronto has resorted to the use of a chemical disinfectant for purposes of purifying its water supply.

Toronto has of late suffered from a sewage contaminated water supply. The typhoid rate, although now on the decrease, has proved disastrous during the last few months.

Lake Ontario water, which normally only contains from 8 to 10 bacteria per c.c., has of late presented bacterial counts of over 5,000 bacteria per c.c.; and amongst these bacteria are numerous colonies of B. coli, proving sewage contamination.

Lake Ontario water is supplied to Toronto by a gravitation intake pipe from the lake to a pump well located on the bay shore. The water is then supplied, mostly, by direct pump pressure to the consumers; otherwise, for a small part of the city, from a high-level reservoir, to which the water is first pumped.

The sewage contaminated condition of the water supply has been officially recognized for many years. Over ten years ago Mansergh, the English specialist, was brought over to report on the matter, and he recommended sand filtration.

Just over one year ago the city passed a by-law sanctioning the cost of $750,000 for the installation of a sand filtration plant modelled on the British and Hamburg types. This plant will not be completed until the end of this year or beginning of next.

The recent enormous increase in the typhoid rate, the apparent fact that the water was rapidly showing greater contamination, and the alarming discovery that a sand and silt bank about twenty-five feet high had formed around the intake bend, brought about a press agitation in favor of immediately extending the intake pipe further into the lake into deeper and less turbid water, where there would obviously be less chance of sewage contamination.

The present intake pipe was originally at a depth of 75 feet, but, owing to the formation of the drift, this depth is now reduced to 50 feet. The bottom of the lake slopes rapidly, and a very short extension of the pipe will necessarily land it at a depth where it will be impossible for divers to work.

The official engineering advisers recognized the immense difficulties and great expense attending any extension of the intake pipe to depths of over 100 feet. The Health Department, strongly backed by Dr. Harrison (late Controller), were in favor of filtering the water, and initiated a policy which was built upon a hypothesis, that it was impossible to obtain pure Ontario Lake water without adopting some method of purification.

The city having compromised itself to an expenditure of $750,000 in order to purify Lake Ontario water, the Engineering Department naturally determined to leave the intake location alone. We can imagine the Engineering Department arguing thus:—

The water shows signs generally of sewage contamination. The sewage contamination is the result of the intake pipe taking water from within the zone of sewage contamination.

The city has adopted the policy of removing the sewage contamination by means of slow sand filtration.

Then why go to the expense of spending a large sum of money on a further difficult undertaking, which may make the expenditure of $750,000 on filtration a useless and foolish extravagance?

No doubt, if it had not been for this present outbreak of typhoid and formation of silt around the intake, the pipe would have been left alone, and the city would have relied entirely upon slow sand filtration for a pure water supply.

An extension policy has, however, now been adopted. The intake pipe will be carried out another 1,500 feet into nearly 200 feet of water. Flexible joints will be used, the work being done on the surface, and the pipe lowered to its bed supported on cradles.

This does not mean the abandonment of filtration. The city is compromised to filtration, and the plant will evidently be proceeded with, whether the new Ontario lake water shows its necessity or otherwise.

Some people may ask: Why was not the extension of the intake pipe tried first? Why was it not made absolutely certain that pure Ontario lake water could not be obtained before it was decided to purify impure Lake Ontario water? Such questions, when related to civic policy, are unanswerable. They are like questions affecting the origin of matter—they simply drive a fellow crazy.

In the meantime, however, the extension of the intake pipe will take some considerable time. The water is bad, and typhoid is general. The Medical Officer of Health is reported as saying that the water will probably even get worse. How are we to reduce or exterminate the typhoid germs at present in the water?

This is just the psychological moment, when disinfection of a water supply, if possible, occurs.

Two or three barrels, in which are mixed calcium hypochloride (chloride of lime) with water, the mixture added to the water in parts of from .2 to .5 available chlorine in 1,000,000 gallons of water at some convenient point before the water is delivered to the consumers, and the trick is done.

Mr. T. Aird Murray, C.E., of Toronto, advised the Mayor of Toronto to at once adopt disinfection methods by the use of hypochlorites. This was at once done, and