

(b) At a point 500 feet beyond the intake pipe, depth of water 100 feet (sample taken by the "Telegram"), 448 bacteria per c.c.

Sample (a) means that the water at the intake pipe contained 99.16 per cent. more bacteria than pure Ontario Lake water.

Sample (b) means that the water 500 feet beyond the present intake at a greater depth contained 97.77 per cent. more bacteria than pure Ontario Lake water.

How far is it necessary to continue the intake pipe into the lake in order to ensure at all times pure Ontario Lake water?

Under present and future conditions we cannot see how the "Telegram" or anyone else can answer this important question.

What are the present conditions? The whole of the sewage from Toronto (over 30,000,000 gallons per day) enters Lake Ontario and Toronto Bay anyhow and anywhere in its raw, crude state.

What are the proposed future conditions? The whole of the sewage from Toronto will be collected at one location, $3\frac{1}{2}$ miles east of the intake pipe. From 60 to 70 per cent. of the grosser solids will be there removed from the sewage and dumped into Ashbridge's Bay. The whole of the crude liquid sewage, with from 40 to 30 per cent. of the finer solids, will be sprayed into Lake Ontario at a point where there is acknowledged, at times, to be a direct current towards the intake pipe. This sewage will hand out millions of bacteria per c.c. to pure Ontario Lake water.

Alfred W. G. Wilson (geological lecturer, McGill University), states in "Currents and Shore Processes in Lake Ontario as follows:—

"The local longshore currents west bound off Scarborough' sometimes attain a velocity of nearly four miles per hour during a period of easterly winds. This means that any waste which would float or mix with the waters of the lake would reach the western end of the Island within two and a half hours from the time when it was discharged into the lake at any point near Victoria Park."

The Island itself has been built up, and is still being added to, by this current. If sand will carry from Scarborough' to the Island, why not bacteria?

If we admit the present and future possibility of sewage contamination of pure Lake Ontario water, is the lengthening of the intake pipe an alternative to filtration?

The answer must be: "Any reasonable prolongation of the intake pipe into deeper water will not insure the delivery of pure water, at all times, unless it be accompanied by measures to remove all chance of sewage contamination, re-establishing the pristine characteristics of pure Ontario Lake water in the neighborhood of Toronto.

Can the City Council, any newspaper, any body of men, or any hygiene expert, "take a chance" when it is a question of civic policy affecting life and death?

When the whole of Toronto's crude liquid sewage is concentrated and poured into this western current, who is going to say just where the intake pipe should stop and at what depth?

The proposed extension of the intake pipe, under present conditions, is no alternative to sand filtration or any other approved method of water purification.

If it is possible to extend the intake pipe, then certainly extend it. Better and less turbid water will be

obtained further out in the lake, giving less work to the filters and providing greater efficiency in results.

There exist two solutions to Toronto's pure water supply problem, and two only. They are:—

(a) Admit that it is impossible to keep sewage contamination out of Lake Ontario in the neighborhood of Toronto, then proceed to filter out the sewage poured into it, and so reduce the typhoid chance by from 98 to 99 per cent.

(b) Admit that it is possible to keep sewage contamination out of Lake Ontario (by "sterilization of sewage" methods or any other method), and then admit that the necessity has ceased to filter out something which no longer exists.

As a corollary to either of the above propositions there may be added: **Extend the intake pipe to beyond the zone of turbidity if possible.**

STERILIZATION OF SEWAGE EFFLUENTS AND TORONTO'S PURE WATER SUPPLY PROBLEM.

In last week's issue The Canadian Engineer dealt with the question of sterilization of sewage effluents in a review of the valuable experimental work recently carried out in the United States by E. Bernard Phelps.

It was shown that in accordance with the results obtained by Phelps it is possible to disinfect crude, settled sewage to the extent of a bacterial removal of from 98 to 99 per cent. by the addition of from five to ten parts per million of available chlorine at a cost of from \$1.50 to \$3 per million gallons of sewage.

For a city of the size of Toronto the capitalized cost of installing, operating and maintaining a sewage disinfecting plant would not exceed \$500,000.

The capitalized cost for removing the sewage from Lake Ontario water by sand filtration is \$1,100,000.

It will cost more than twice the amount of money to remove the sewage bacteria from Lake Ontario water as it will cost to keep the sewage bacteria out of Lake Ontario water.

The delivery of crude liquid sewage direct into Lake Ontario will affect the people of Toronto in a hundred and one other ways apart from the direct water supply.

Toronto is spending \$2,500,000 in order to concentrate the whole of its liquid sewage, plus from 40 to 30 per cent. of the finer solids in the western lake current in order that Toronto Bay may be free from sewage, and in order that the sewage may have a free, unimpeded run to the water supply intake.

Toronto is spending \$1,100,000 in order to remove from the intake pipe water the sewage which they are providing by the above cost of \$2,500,000.

When Toronto discovers that the old maxim, "Prevention is better than cure," is true of Toronto as of elsewhere, then, and then only, will Toronto's pure water supply be solved to the satisfaction of everyone concerned.

MAYOR GEARY AND TORONTO'S PURE WATER SUPPLY PROBLEM.

The greatest task which Mayor Geary has before him during his term of office is to formulate some comprehensive policy which has in view: The repurification of Lake Ontario water, and the solution for ever of Toronto's pure water supply problem.