

(f) Ample area of land for digestion of sludge from the sedimentation tanks.

They will form the most up-to-date sewage scheme in the whole of Canada, and will include all the most important modern features. The scheme has been formulated by Canadian engineers, without advice from the States or elsewhere. The engineers employed by the corporation are Mr. Darlington Whitmore, of Regina, and Mr. Macpherson, of the Provincial Works Department, while Mr. T. Aird Murray, engineer to the Bureau of Health, has acted as consulting engineer from time to time.

Although Regina is leading the way, other cities and towns are falling into line, and it is safe to predict that in the course of two or three years the Province of Saskatchewan will have done more than any other Canadian Province to maintain and conserve the purity of its natural water supply sources.

## TORONTO'S SEWAGE CONTAMINATED ZONE AND ITS WATER SUPPLY.

Continually we hear discussed by the Board of Control, by the Medical Officer of Health, by the daily newspapers:—

How far does Toronto's sewage contaminated zone extend into Lake Ontario?

Just how far should the intake pipe be extended?

How long will it take for any extension to come within the danger zone?

Never are the following questions discussed either by the Board of Control, the Medical Officer of Health or the daily newspapers:—

What measures should be taken to prevent the contamination of Lake Ontario by sewage?

Why should raw sewage be permitted to enter Lake Ontario?

Why allow the sewage contaminated zone to increase?

Why provide for an increased length of intake pipe, anticipating further and increased contamination of the lake?

The policy of the Board of Control, of the Medical Officer of Health, of the daily newspapers is: Let us flee further and further from the increasing sewage contaminated zone. We are confessedly not strong enough, not manly enough, to tackle the enemy at home.

The policy of this Review in all sanitary matters is: "Prevention is better than cure." If the sewage effluents from Toronto were sterilized, viz., the enemy strangled before he does the damage, then the problem of having to face a further and yet further extension of the intake pipe would not exist.

The policies of Cleveland, Buffalo, etc., of constantly fleeing from an increasing danger is but the policy of a moment.

The policy of absolutely preventing either the occurrence or extension of any zone of sewage contamination is a final one.

## WATER FILTRATION IN THEORY AND PRACTICE.

(An address given before the Undergraduate Society of Applied Science at McGill University, Montreal, on February 23, 1910.)

George C. Whipple.

Consulting Engineer, New York City

I have chosen the subject of filtration of water for two reasons, first, because it is a typical, and perhaps the best, example of what modern sanitary science is doing for the health and comfort of mankind; and second, because it is a practical problem that is becoming pressing in many a Canadian city, and, therefore, is of vital interest to you, not only as scientists, but as citizens.

### Requirements of a Public Water Supply.

A public water supply, in order to be generally satisfactory, must conform to certain standard requirements. It must be safe and wholesome, that is, free of poisonous substances and disease germs; clear and without perceptible color, taste or odor; reasonably soft, and nearly free of iron and other mineral salts. If the water is hard, too much money must be spent for soap needlessly wasted; if it is saline, plumbing fixtures and steam boilers will be corroded; if it contains too much iron the clothes in the laundry may become stained. If the water is highly colored or muddy, it is unattractive for drinking and even for bathing; if it contains algæ, the taste and odor of the water may be intensely disagreeable, and, what is of paramount importance, if there are present the germs of typhoid fever or dysentery or other water-borne diseases it may be positively dangerous.

### Typhoid Fever and Water Supplies.

It is, perhaps, hardly necessary to enlarge upon the relation that exists between typhoid fever and water, because of the numerous epidemics that are constantly occurring. If proof were necessary it is abundantly found in the vital statistics of all countries, which show that cities that have water supplies taken from pure mountain springs or waters that have been filtered have low typhoid fever death rates, while water supplies taken from polluted streams cause high death rates. The great epidemics have been an important influence in hastening the installation of filters. The spectacular occurrence of many typhoid fever deaths at one time always makes a deeper impression on the public thought than the same number of deaths scattered over a long period. It may be fairly said, therefore, that in the long run such epidemics have saved more lives than they have cost, because they have attracted attention to dangerous conditions that otherwise would have been overlooked. Epidemics have been influential in another way. They have shown that water supplies apparently but little polluted are liable to sudden infection. Some of the worst outbreaks of typhoid fever have occurred as the result of sudden and unexpected infection of a water supply hitherto regarded as safe. The damage that can be done by a single case of typhoid fever on a sparsely settled watershed testifies to the soundness of the position taken by Germany in compelling all surface waters to be filtered and prescribing certain standards of efficiency.

But a still more potent force at the present time is the public opinion that is rolling up in tremendous volumes in favor of better sanitation and greater cleanliness all along the line. Nothing is more conspicuous in magazine literature at the present time than the prominence given to public hygiene, and from cleanliness demanded for the sake of