

THE Sanitary Review

SEWERAGE, SEWAGE DISPOSAL, WATER SUPPLY AND
WATER PURIFICATION

TYPHOID AND POLLUTED DRINKING WATER.

Those who have studied the history of typhoid epidemics in cities are unanimous in concluding the cause to be "**Sewage-polluted drinking water.**"

This is amply proven in the cases of both European and American cities, where, after means have been taken to purify the water, typhoid has practically ceased to exist.

London, Berlin, Hamburg, Breslau, Zurich, Lawrence, Mass., and a host of other places have shown a marked decrease in the typhoid rate with the installation of suitable filtration plants.

The degree of a typhoid epidemic is in proportion to the number of typhoid germs in the water supply. On the assumption that a person discharges seven ounces of faeces per day, he also discharges 200,000,000,000 bacteria per day. The number of bacteria in sewage is so great that a large river is affected by the sewage discharge of even a small village.

* "Taking the population of Lowell in 1892 at 85,000, and the average daily flow of the Merrimac at 6,000 cubic feet per second, and assuming that 200,000,000,000 bacteria are discharged daily in the sewage from each person, they would increase the number in the river by 1,160 per c.c., or about 300,000 in an ordinary glass of water.

"The average number found in the water eight miles below, at the intake of the Lawrence waterworks, was more than six times as great as this, due in part to the sewage of other cities higher up.

Faeces of people suffering from typhoid fever contain the germs of that disease. What proportion of the total number of bacteria in such faeces are injurious is not known; but assuming that one-fourth only of the total number are typhoid germs, and supposing the faeces of one person only to be mixed with the whole daily average flow of the river, it would put one typhoid germ into every glass of water at the Lawrence intake, and at low water several times as many proportionately would be added. This should give some conception of the dilution required to make a polluted water safe.

Pittsburg and Alleghany, taking their water supplies from below the outlets of some of their own sewers, have suffered severely (103.2 and 127.4 deaths from typhoid annually per 100,000 population in 1888 to 1892.)

Wheeling, W. Va., with similar conditions in 1890, was even worse, with a death rate from typhoid of 345 per 100,000, while Albany had only comparatively mild epidemics from the less directly and grossly polluted Hudson. Lawrence and Lowell, taking their water from the Merrimac, both had for many years continued ex-

cessive rates, increasing gradually with increasing pollution; and the city having the most polluted source had the higher rate.

Chicago has for years suffered from typhoid fever, the rate fluctuating with the degree of pollution of the lake. An unusually large discharge of the river results in a higher death rate. Upon abandoning the shore intake near the mouth of the river in 1892, the typhoid fever death rate fell 60 per cent.

Every case of typhoid is not directly due to drinking infected water. The first number of cases directly due to polluted water are generally followed by contact cases, due to carelessness in isolation. That some cases happen with people who have never drunk the tap water is no evidence that the origin of the epidemic is not due to polluted water. It is fair to say that all cases are either directly or indirectly due to the polluted water.

The broad fact that cities with polluted water supplies, as a rule, have high typhoid death rates and cities with good water do not (except in the occasional cases of milk epidemics) is the best evidence of the danger from bad water.

OSHAWA SEWAGE DISPOSAL.

The town of Oshawa have lately had a scheme accepted by the Provincial Board of Health for the purification of sewage on the modern recognized system of removal of solids by sedimentation tanks and production of a non-putrescible effluent by percolating biological filters.

We have had drawn to our attention a letter published in a local Oshawa paper by presumably one of the residents, who undertakes to pose as a sanitary critic and expert. His knowledge upon the subject appears to be summed up in a total contempt for all modern methods of dealing with sewage disposal. Here is a sample of the hot air and bluff which he hands out to his fellow-citizens: "If the town council will agree to pay the expense I will undertake to produce seventeen different methods of handling sewage, all up to date, from seventeen different and eminent engineers, and have them all endorsed by the Provincial Board of Health in seventeen days."

We take the liberty of calling this "hot air and bluff," because the writer must know before hand that there is not the slightest chance of his offer being accepted by the council; and, therefore, there is no chance of proving the correctness of his statement.

We would not like to deny that this evidently widely-read and experienced citizen in sewage disposal is fully acquainted with seventeen up-to-date methods of handling sewage, and also that he can immediately put his finger upon the seventeen eminent engineers, who are individually prepared to run his seventeen different

* Filtration of Public Water Supplies (Hazen).