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THE PROBLEM OF THE GREAT LAKES

The spread of disease, principally Asiatic cholera and typhoid fever by the use of polluted water supply has caused the Government of the United States through the offices of the hygiene laboratory to conduct serious investigations into the sewage pollution of interstate and international waters, with special reference to the spread of typhoid fever. That section of international waterway which most affects Canada is of course Lake Erie and the Niagara River. Owing to the increase in population of many Canadian municipalities on the borders of these waters and the consequential increase in the water supply and sewage disposal systems we have prepared this article, and present it with a special view of service to Canadian municipalities fronting on international waters.

In a recent address by a Canadian authority it was pointed out how the sewage of Buffalo, N.Y., even after its severe aeration by the falls and rapids of Niagara, seriously pollutes the intake of Niagara-on-the-Lake and the south shore of Lake Ontario.

In discussing the question of pure water supply it is impossible to separate this prime sanitary need from the question of sewage disposal; it is equally impossible in North America to separate these sanitary necessities from a direct relationship with the prevalence of typhoid fever. The coincident drop in typhoid fever rates with an improvement in the water supply has been observed in many instances. Figure 1 shows graphically this reduction of typhoid fever death rates in some large cities of the United States.

However important the relation of water supply may be, there are other factors which occupy no mean position in this respect. The rigid inspection and control of milk in all probability will still further reduce the incidence of typhoid fever. After these factors, water and milk, have been eliminated there will remain, however, a certain reduced typhoid rate, which is due to other causes. This persistence of typhoid fever in a city or town independent of the water and milk supply depends upon failure to dispose of in a proper manner or care for the excreta of persons infected with typhoid organisms. Carriers come into a community

and often remain undiscovered. Many mild or ambulatory cases are never diagnosed as typhoid. Often because of poverty or other reasons no physician is called, and the case is unreported. This is especially frequent in the mild or atypical cases of children. Even if a physician is called, he may fail to diagnose typhoid because typical symptoms are absent or masked by other conditions. The physician's diagnosis and institution of preventive measures may be tardy, leaving a period during which the excreta are uncontrolled. Often, too, the case is discovered early, reported promptly, and proper instructions given in prophylactic measures, but cases are known where these measures are not properly executed.

Prof. Wm. T. Sedgwick, an authority in the United States, expresses his opinion that tourists, visiting points of interest such as Niagara Falls, etc., where polluted water supplies are drawn upon often, carry away the seeds of typhoid fever and spread the disease in foreign and distant parts.

The principal international waterways are Lake Erie, Lake Ontario, Niagara River and the St. Clair River. The Canadian population on the shores of these waterways may be placed at 600,000, while that of the United States is approximately 2,400,000.

There are no large cities or municipalities of the United States which seriously infect Lake Ontario, so that any infection other than that received by Canadian sewage is fed from Lake Erie, which water passed Detroit and Windsor, on the St. Clair River.

The importance of Lake Erie as a source of public water supplies can not be overestimated. Lake Erie contains 17,500,000 million cubic feet of water, which affords storage for the water discharged into it for about 920 days.

This great natural reservoir, with capacity for 920 days' storage, assures a high degree of purification by natural agencies, such as dilution, aeration, and sedimentation, besides affording the storage time necessary to permit of the natural death of pathogenic bacteria. The ability of the natural agencies operating in the lake to render sewage in-

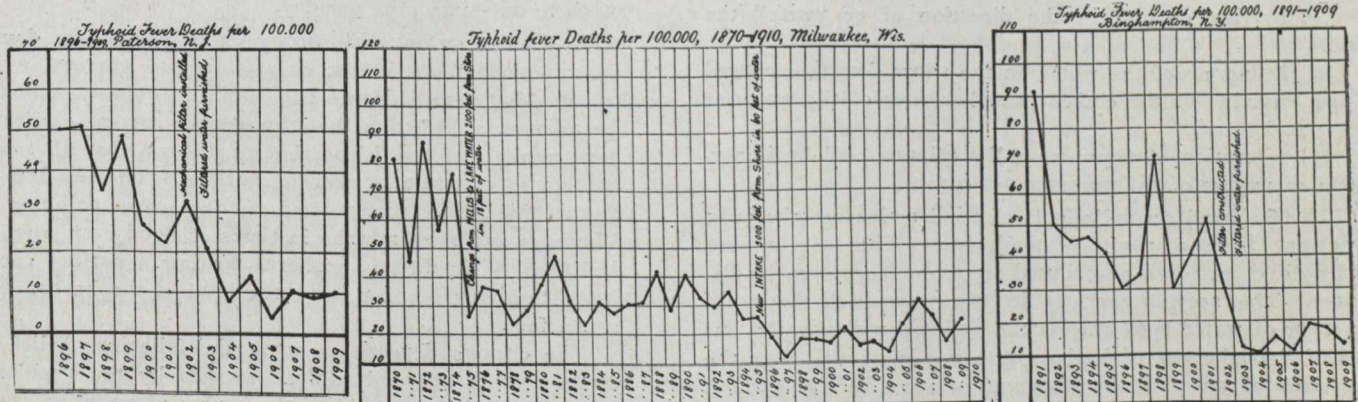


Fig. 1.