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TORONTO'S SEWAGE DISPOSAL PROBLEM

IN the article on performance of the slow-sand filters at Toronto, which appeared last week in *The Canadian Engineer*, Norman J. Howard, bacteriologist in charge of the filtration plant laboratory, shows that the pollution of Toronto's raw-water supply has increased approximately 62% within the past five years, judging by B. coli tests. Of the 300 days in which examination of the raw water was made during the year 1918, the typical colon-bacillus was present in one cubic centimetre on 121 days.

The continual deterioration of the raw water at Toronto is due to the increase in discharge of sewage into the lake. While this applies not only to Toronto but also to many other neighboring municipalities which are daily discharging large quantities of sewage into the lake, the absence of proper sewage disposal works at Toronto is undoubtedly responsible in a very large degree for the increased pollution. The Morley Avenue sewage disposal plant, which has never operated to the satisfaction of either the municipal authorities or the public, is now reaching the limit of its capacity for even such work as it is doing, and it is said that within a few months it will have exhausted the areas at its disposal for the deposit of sludge.

As the late Theodore Roosevelt remarked several years ago in Buffalo, the people of Canada and the United States should be sufficiently civilized to be able to get rid of their sewage in some other manner than by dumping it into their drinking water.

Toronto, like many other cities, is faced with a sewage disposal problem that may cost a large sum of money before a satisfactory solution is found, but it will be money well spent, for no money can be spent to better advantage than in the improvement of public health, and there is no phase of

sanitary work that is of more importance than the protection of water supplies.

Fortunately for Toronto and many other cities, the liquid chlorine plant which was installed a few years ago has proven extremely efficient. That chlorinating plant is the only thing that stands between Toronto and a great increase in the typhoid death rate. The amount of raw sewage that is being poured into the lake, comparatively near the water supply intake, is so polluted with matter of excremental origin that the water could never be filtered so efficiently as to render it entirely innocuous. Moreover, the filtration of such heavily polluted water would cost an enormous sum for coagulant if Toronto's drifting sand filter plant had to be operated every day in the year, and every hour in the day, to the highest possible efficiency. In order to reduce the expense for coagulant, the plant is now being operated, it is said, at a lower efficiency than the filters are capable of showing, and the chlorinating apparatus is being relied upon to sterilize the water, as it has been proven by months of experience that the chlorine treatment ensures sterile water even when the filters are being used only to cleanse the water.

The high efficiency of the chlorine plant, however, does not excuse Toronto from a solution of the sewage disposal problem. It is far safer to prevent pollution of water supplies than to remedy the pollution. There will come a day when the load upon the Toronto filtration and sterilizing plants will be extremely serious unless active measures are taken to solve the sewage disposal problem. The works department of the city of Toronto realizes this, as the works commissioner has been requesting the city council for the past two or three years to authorize the expenditure of \$50,000 for sewage disposal experiments, but some of the other civic officials and some of the city councillors have not so thoroughly realized the urgent need for action. Nevertheless it is understood that the department intends at an early date to send an engineer to Milwaukee to reside there for several months in order to study the activated sludge method of sewage disposal in co-operation with T. Chalkley Hatton as consulting engineer; and also that the department intends to experiment with a new English centrifuge for dewatering sewage sludge. It has also been said that Dr. Nasmith, director of laboratories of the health department of Toronto, has under investigation a very promising method of sludge disposal, and his work is being watched with interest by the other Toronto civic officials.

WATER WORKS MONTHLY REPORTS

AS a part of its system of control of water purification plants in Wisconsin, the Board of Health of that state recently issued a report form which must be filled out and returned monthly by the superintendent or operator of every water purification system within the board's jurisdiction.

The form requires a statement of the number of gallons of water pumped, pounds of liquid chlorine or "hypo" used per twenty-four hours, P.P.M. of chlorine used, free chlorine in treated water, bacteria count in raw and treated water at 20 and 37 deg. C., and the B. coli count in raw and treated water in 1cc. and 10cc. This information must be given for every day of the month; also the number of filters used each day, the hours of service of each filter (length of run), the average filtration rate, the loss of head (initial and final) on each filter, the number of washes and number of minutes per wash, the amount of water used for washing, the amount of alum used in pounds and in grains per gallon, the turbidity in P.P.M. in the raw water and in the effluent of each filter, and the alkalinities of the raw and clear water.

If the board can persuade all plants, both large and small, to make a complete return of this information for every day in the year, it will certainly have a valuable record of water supply conditions in that state, but we fear that in connection with the reports from small plants there will be either many blanks or frequent guesses. However, it is the intention of the board to conduct an efficiency run of every plant at least once a year, and that will assist greatly in checking the reports.