MUNICIPAL DEPARTMENT

SEWAGE DISPOSAL IN ONTARIO.*

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(Concluded.)

We have at present only two filtration areas on any large scale in Ontario—one in connection with the Asylum for the Insane, London, and the other the Berlin sewa e farm. Plans have also been prepared for a system at Waterloo, where the work is partly finished. Guelph and Galt are considering the putting in of sewerage systems, and will probably have filtration areas in connection. The system at the London Asylum was designed by Col. Waring, and is the Intermittent Downward filtration system. The sewage from the different buildings is collected in a large tank constructed of brick and lined with cement, having a capacity of rather more than 100,000 gallons. From the tank the sewage is pumped by a six-inch rotary pump to the filtration area, through an eight-inch spiral riveted steel pipe about 1,550 feet long. The filtration area comprises about four acres, laid out in eighteen parallel ditches eight feet wide at top, two feet wide at bottom, and one and one-half feet deep, separated by beds ten feet wide at top. The bottoms of the ditches are all in the same horizontal plane. The sewage is conveyed to these by an eighteen-inch vitrified channel pipe running from the distributing well at one corner of the field in a line at right angles to the settling ditches, and connected to them by T channel pipes. The sewage can be turned into any one or all of the settling ditches at will, or can be all diverted to the broad irrigation tract below by inserting small wooden dams at different points in the carrier.

In reply to some questions on the working of the plan, Dr. Bucke, the superintendent of the asylum, writes: "Sewage disposal at this asylum is on what is called the Intermittent Downward filtration system. We use four acres of land for 1,200 persons, and it is ample. The system has been in use here for five years, and has given the most complete satisfaction. The coldest weather gives us no trouble. The sewage in the tank never reaches a temperature lower than, say, 50°, and when thrown into the trenches thaws the ground enough to let it through. We never see the effluent, and so know nothing about it: no doubt it again reaches the surface somewhere as *spring water*, and, no doubt, it is *pure spring water*.

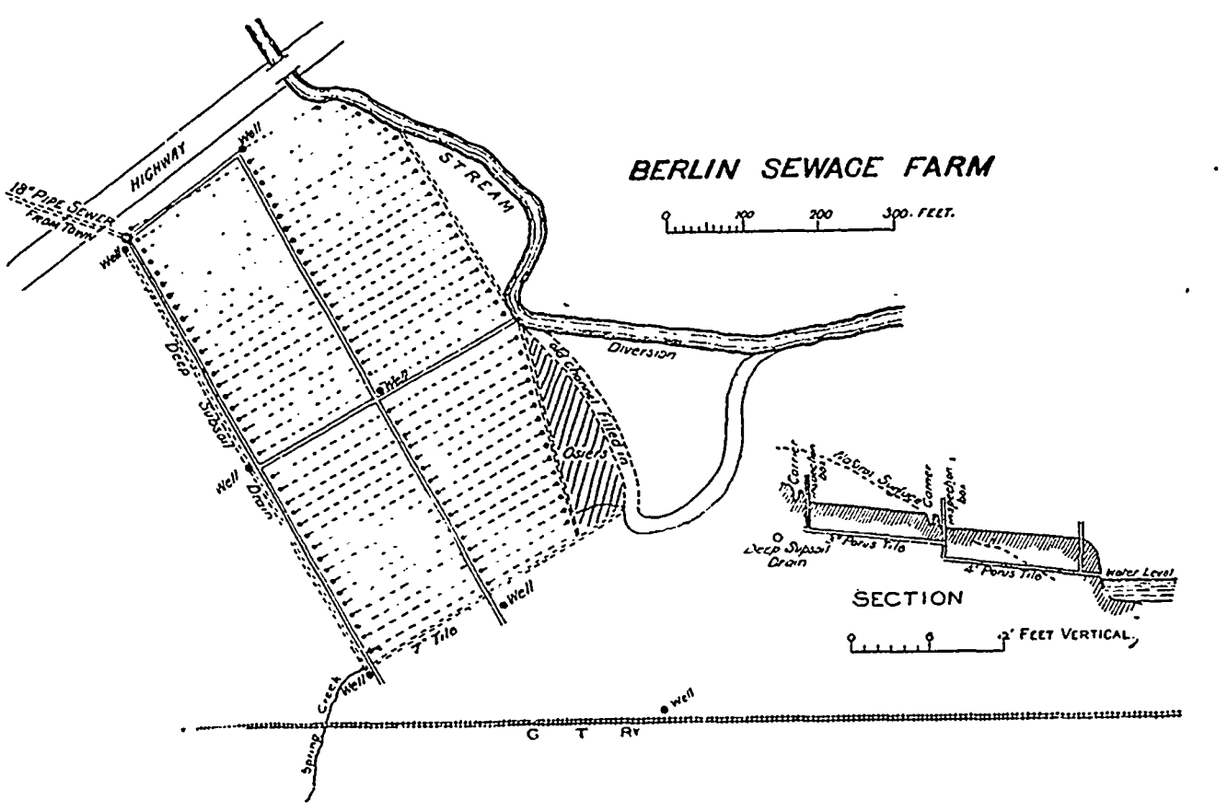
"Using the sewage to irrigate, I grow on the beds between the trenches (*i.e.*, on about two acres of land) a crop worth from about $800 to $1,000 a year. The system is not only economical, but, I am satisfied, could be made to pay enormously if properly carried out for cities, towns, and villages."

The plant at Berlin was designed by Mr. Willis Chipman, C. E., and superintended by Mr. H. J. Bowman, town engineer. The system is Broad Irrigation. There are about twenty acres in the farm, only eight having been graded and underdrained. The sewage in this case is not collected in a tank, but runs directly to the irrigation tracts. These tracts are graded and underdrained to a depth of from three to four feet, this being the maximum attainable on account of the insufficient elevation of the tract above the watercourse into which the drains discharge. The drains are of agricultural tile, in parallel rows sixteen and two-thirds feet apart. Inspection boxes, six inches square, made of plank, are situated at each end and at the middle of each drain. Small wells have also been dug at different points on the farm for the purpose of observing the height of the subsoil water. The farm has been in operation since 1892. Writing under date of January 23rd, 1895, and referring to the Berlin farm, Mr. Bowman says: "This method works very well except in winter, when, on account of the beds having a fall away from the carrier, the sewage runs across the surface in channels.* During the past summer we have added new ends perfectly level."

Mr. Bowman has kindly sent me a plan of the proposed works at Waterloo, accompanied by the following description: "These beds are about 200 × 132 feet, perfectly level, and separated by embankments formed from the top soil. Tile drains will run across the beds and only ten feet apart, and vary from three to four feet below the surface. This depth is not sufficient to give the best results, but is enough for partial purification, which is all that is required, as the stream receiving the effluent is not used as a water supply."

The great objection to the adoption of sewage disposal by application to land in Ontario seems to be the idea that our climate is too severe in winter for the proper working of such a system, an objection more fancied than real, as the unqualified success of the plant at the London Asylum has demonstrated. The Berlin system must also be considered a success, since it is being followed by a similar one at Waterloo. However, it is only by trial that the details of the system best adapted to the varying conditions of our climate can be discovered. There is no doubt that the success of the London farm is in part due to the exceptionally favorable nature of the soil, but there is also reason to believe that a great element in its successful working in the winter season is the fact that the sewage is collected in a large tank and then discharged over the filtration area before it has time to become very much lowered in temperature, the amount of heat in the liquid due to its temperature above the freezing point being sufficient to thaw the ground and admit of its uniform filtration through the soil, and, were this point in detail adhered to in all cases instead of letting the sewage dribble over the soil as it comes from the outlet, there would probably be less cause to think that our Ontario climate in winter is too severe for successful sewage disposal by land application.

Toronto, March 5th, 1895.



*Abstract of paper read before the Engineering Society of the School of Practical Science, Toronto.

*For some reason the beds were constructed with a greater slope than intended by the designer.—R.W.T.