MUNICIPAL DEPARTMENT

SEWAGE DISPOSAL IN WESTERN ONTARIO.*

By W. M. Davis, C.E., Berlin.

Mr. President and Gentlemen:—So much has been said and written on the subject of sewage disposal during the last fifteen years that the writer does not hope to present anything new to this association of scientific gentlemen, the majority of whom have for many years made this and kindred subjects affecting the public health their especial study, but merely to submit for discussion the results of his practical experience and observation as an engineer. We have most of us come to very definite conclusions on this subject at different times during the period mentioned, and have as many times been forced to change those conclusions in the light of later experience.

A very short time since all that was considered in the way of disposal by the most advanced municipalities in this country was the removal of household wastes to such a distance that their decomposition would not offend the senses of those with whom they originated. Our efficient Provincial Board of Health has, however, changed all that, and a sewerage system can now only follow on the heels of a satisfactory scheme for the disposal of the sewage.

Of the many different systems of disposal, chemical precipitation, broad irrigation, intermittent filtration, bacterial treatment in septic tanks or contact beds or both, time does not permit a description or a discussion of their several advantages and disadvantages. It is sufficient to say that these advantages and disadvantages exist in each, that a system admirably adapted for one town may be totally unsuited to a neighboring town of the same size, and that the proper system to adopt in each case can only be determined by an intelligent study of the peculiar conditions that exist in each locality. In one locality the situation may be such that the elevation of the town and the surroundings point to broad irrigation as the most efficient and economical system. In the next a large tract of suitable land for this purpose may not be within reach, but a smaller area may be had for intermittent filtration. In the next these conditions may be absent, when recourse must be had to chemical or bacterial treament. The majority of failures in sewage disposal have occurred through the inability to appreciate these facts

"Intermittent filtration" is adopted where the soil is unsuitable.

"Chemical precipitation" where the finances do not permit of a system costly in maintenance, and the writer has heard of one town in the United States where a septic tank is being constructed in the public park and it is proposed to erect on the roof a grand stand from which to view lawn tennis and base-ball games. Each of these systems would under proper conditions produce satisfactory results, but under the circumstances described would be condemned as failures.

Valuable lessons may be learned from the experience of certain disposal plants in Western Ontario. In 1892 the Town of Berlin purchased 20 acres of land 1½ miles from the town for the purpose of treating the sewage by intermittent filtration; unfortunately the soil was what is usually called "hard pan," a mixture of fine sand and clay. For a time, probably while the quantity of sewage to be treated was small and chiefly of a domestic character, the results were not unsatisfactory, but as the town increased in size and the manufacturing establishments multiplied the volume of sewage was augmented and its character changed until an analysis now shows it to be as foul as some of the English factory towns. It is therefore no wonder that the original plan failed in giving satisfaction. In 1899, on the recommendation of the writer, who was engineer for the corporation, a septic tank and two bacteria beds were installed, not with the idea that the capacity was entirely sufficient for even present needs, but it was believed that the existing filter beds of which some twelve acres had been levelled, could be cropped, that the septic effluent which experience with a small water tank had shown to contain much ammonia could be used to irrigate and would force the growth of the crops. In this manner a revenue would be produced which would partially defray the cost of maintenance, the money invested in the original system would thus not be lost, and it was hoped that the use of the two bacteria beds in conjunction with irrigation would relieve the cropped beds when the quantity of effluent was more than could be turned on the crops without injury to them, and would effect a disposition of the effluent which would cause no nuisance; should the experiment prove successful it was the intention to enlarge the capacity of the tanks and beds as circumstances demanded. The tank has a capacity of 56,000 gallons, or ¼ of the daily flow of sewage at the time it was designed.

The bacteria beds are 76x50 feet, with a depth of 3 feet of clean gravel; the upper 2 feet 4 inches is from ¼ inch to 1-16 inch in size, the lower 8 inches is coarser, the stones being from 1-2 inch to 2 inches in diameter.

The beds are underdrained by field tile, the outlet being through a gate chamber. It is intended that the sewage should be held quiescent in the beds for two hours to give time for bacterial action A. As plans accompany this paper the details of construction will be understood without further explanation.

(To be Continued)

* Paper read at the seventh annual meeting of the Association of Executive Health Officers of Ontario.

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