

MUNICIPAL DEPARTMENT

TO MUNICIPAL OFFICERS.

The CONTRACT RECORD is desirous of publishing, as far as possible, advance information regarding projected works of construction in all parts of Canada, such as sewerage and waterworks systems, railways, street pavements, public and private buildings, etc. Municipal officers would confer a favor upon the publisher by placing at our disposal particulars of such undertakings which are likely to be carried out in their vicinity, giving the name of the promoter, character of the work, and probable cost. Any information thus furnished will be greatly appreciated.

SEWAGE PURIFICATION.

The following is the text of a paper on the above subject by Mr. W. F. Van Buskirk, City Engineer of Stratford, Ont., read before the Association of Executive Health Officers of Ontario:

"The smaller cities and towns of Ontario are apparently not prepared to expend large sums of money on sewage purification works, since it is with great difficulty that even a moderate appropriation for sewer construction can be obtained.

"Sewerage is a necessity, and no town in Ontario can long afford to be without a system. Sewage purification in the most approved manner is not always necessary, as in many cases the streams and bodies of water into which sewers discharge are not used for water supply.

"It is well understood that complete purification of sewage can be arrived at only by application to land, either by broad irrigation or by intermittent filtration through sand, gravel, or other porous material. Partial purification of sewage may, however, be attained by several well understood methods and in a great many cases will be sufficient for practical purposes.

"Complete purification, where a sufficient area of suitable land is not available, is expensive and difficult to attain, hence a too severe ruling by the health authorities will evidently tend to discourage and delay the construction of many much needed sewerage systems.

"The courts will apparently prevent pollution of a stream or body of water if riparian proprietors are materially injured, but will take into consideration the balance of inconvenience should the injury be trifling and can be compensated by a payment of money.

"The 'Rivers Pollution Act' is enforced by the authorities in England with great mildness, complete purification of sewage not being insisted upon unless water is taken for domestic supply from the rivers and streams at points which may be reached by the discharged sewage. When

such is the case, however, land treatment is insisted upon. Of this class of streams are those within the water-sheds from which the water supply of London is taken. Upon these streams there are thirty-eight towns which purify sewage by application to land and only one permitted to use chemical methods.

"In the case of streams not used for domestic water supply, any method is allowed that will purify the sewage to an extent sufficient to prevent its becoming a nuisance. Chemical precipitation is the most common method of treating sewage in this class, and in many cases experiments have been and are being made in further treating the effluent from precipitation tanks by rapid filtration.

"When a small quantity of sewage is discharged into a large volume of comparatively pure water, the organic matter in the sewage is destroyed by the oxygen of the air contained in the water and by the action of the minute forms of animal and vegetable life in the water and bed of the stream. In cases, however, where the quantity of sewage is greater than can be thus consumed, part of the proceeds of decomposition of the organic matter takes place in the absence of air, causing objectionable odors and serious pollution of the stream. This condition is greatly aggravated by sedimentation where streams have small velocity or where water is still, as in the case of lakes, etc.

"The sewage of towns and cities in Ontario and the United States is much more dilute than that of English towns, owing to the much greater quantities of water consumed, the average for English towns being about twenty-five gallons per head per day, while that of Canada and the United States is about one hundred gallons per head per day. Further, most of the towns and cities of Ontario have a very small population per acre and by far the greater part of the washing water and excreta is deposited on the land in a way familiar to all, and never reaches the sewers.

"It will be found that in nearly all cases the quantity of sludge to be removed from the sewage is very small as compared with that required in large cities and in England. It is therefore probable, where partial purification only is required, that the methods most in use will not be necessary or advisable and will seldom prove both effective and cheap if applied without taking into consideration the different

conditions which obtain here. Chemical precipitation will, without doubt, prove much more expensive than rapid filtration through gravel aided by a current of air or than straining through coke. The annual cost of chemicals alone, for chemical precipitation, as given by the State Board of Health of Massachusetts, is thirty cents for each head of population, not to mention the extensive plant necessary and the cost of labor.

"The methods above mentioned, of rapid filtration and straining through coke, have the further advantage of disposing of the sludge to a considerable extent and in a much more cleanly and satisfactory manner.

"The following table of results is taken from the report of the Massachusetts State Board of Health and shows the comparative efficiency of the different methods of sludge removal from sewage:

Method.	Average per cent. removal of a lb. ammonia.	Oxygen consumed.	Bacteria.
Rapid filtration through gravel	89		96
Chemical precipitation	57	50	68
Sedimentation	30	21	55
Straining through coke	52	44	43

"The above results were obtained from experimental filters and tanks, using city sewage and operated under trained scientific supervision. Consequently it is to be expected that the less complicated methods would prove comparatively more efficient in general practice in the smaller cities and towns.

"A dilute sewage will naturally show a smaller percentage of purification by any method of treatment than a more concentrated sample, but on the other hand it will pass through the filters at a higher rate of flow per acre and with less clogging of the upper layers of filtering material.

"The above consideration would indicate that it will be possible to discharge the sewage of many small cities and towns into streams during periods of high water without causing a nuisance, but that some means of partial purification during the periods of low water and small flow is desirable; also that the method of straining through coke will give satisfactory results where the sewage to be treated is dilute. It should not be lost sight of that complete purification can readily be obtained by conducting the effluents from the coke-strainers to filter beds of sand or other porous material."

The death of Mr. Louis Kroetsch, clerk of Wellesley township, occurred at Berlin, Ont., last week.

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