

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.

THE SCIENTIFIC BASIS OF SEWAGE TREATMENT.*

By W. J. DIBBIN, F. C. S., ETC., AND GEORGE THURDICHUM, F. C. S.
(Concluded.)

It may not be out of place to state here what, in the opinion of the authors, are the conditions which must be fulfilled by an effluent: (1) It must contain practically no solids in suspension. (2) It must not contain in solution a quantity of organic matter sufficiently serious to rob the stream into which it is discharged of its oxygen. (3) The organic matter it contains must be in such a condition as to yield readily to the natural purifying influences exerted upon it. (4) It must not be liable to putrefaction or secondary decomposition. (5) It must contain nothing inimical to microbial growth and activity; in other words, it must not be sterilized or treated with antiseptics. (6) It must not contain pathogenic organisms. By many who are wedded by long practice to the old methods the new departure is naturally viewed with no little suspicion. Having regard to the large number of solutions of the sewage question which have been put before the public from time to time, this attitude need not cause surprise; and, indeed, were it not for the results of experience during the last six years, the authors would probably be the first to advise caution. In fact, this is indeed their present attitude in a large number of cases, as, where factory refuse has to be dealt with, experimental enquiry is by far to be recommended, as without careful study of the conditions obtaining in each case disappointment and failure may result. On the other hand, indifference and obstruction to scientific progress are to be condemned.

It has been laid down by the State Board of Massachusetts that the purifying action of the bacteria in a filter depends upon the passage of thin films of water over surfaces in the presence of air. During this process the air dissolved in the

water is being continually used up by the life action of the bacteria, and will need replacing in order that the supply may be continuous. This re-absorption of air will take place with considerable rapidity when the exhaustion is great, but at a greatly reduced speed as the degree of aeration increases, and it necessarily follows that the rate of work done must be governed by that of the power of the water to re-absorb fresh supplies. Just as the conditions relating to the supply of air must be under efficient control, so must the quantity of organic matter in the form of sewage be regulated to the requirements of the organisms. Thus the number of times the bacteria beds can be charged with sewage, consistent with good and continuous work, will depend upon the quantity of solid matters in the sewage; as it may be supposed, that when the organisms are present to a maximum extent permissible with good work, their powers for the destruction of these will be limited, and if they are fed beyond that point they will grow beyond the capability of the water to supply them with oxygen, and putrefaction will result. Of later years it has become a stock expression to refer to the nitrification of the organic nitrogen. If the nitrogen formed the major constituent of the foul matters, the reference would be more in order. As, however, the carbon and hydrogen are present to a much larger extent than the nitrogen, it would be far more correct in some respects to refer to them as indicating the extent of the work accomplished, and therefore the older expression oxidation is to be preferred, as it applies to each of the three constituents instead of to only one. On the other hand, it may be argued that as the nitrogenous matter is the most objectionable and most easily rendered putrid, the destruction of this is therefore more important, and the nitric acid is the only measure of the extent of the oxidation of the nitrogenous matters. Briefly put, and without reference to analytical factors, the foregoing may be looked upon as a short resume of the present position of the question so far as relates to the disposal of the foul matters which render sewage offensive, repugnant to our senses, and dangerous to health, and the authors are confident that it will only be by careful and continuous study of the question on these lines that advance will be made. The moment that neutral agencies around us are interfered with, and force attempted

to be used in the shape of antiseptics, heaping vast masses of putrefying sludge together, etc., failure will inevitably dog our footsteps as it has done for so many years past in place after place.

LEGAL DECISIONS AFFECTING MUNICIPALITIES.

BROUGHTON V. TOWNSHIPS OF GREY AND EIMA—Where the council of a municipality assumed to pass a by-law under section 585 of the Consolidated Municipal Act of Ontario, for the construction, maintenance and repair of drainage works, and thereby to charge and assess lands in an adjoining municipality for benefit as for outlet, in order to raise the funds necessary to meet the cost of such works, the Supreme Court of Canada held, reversing the judgment of the Court of Appeal for Ontario, and of a Divisional Court, that as the drain only emptied into a natural stream extending into the adjoining municipality, the lands in such adjoining municipality purported to be affected by such by-law were not assessable for a liability thereunder to contribute towards the cost of the works, and so far as they were concerned, the by-law was ultra vires of the initiating municipal corporation; and that a person whose lands might appear to be affected thereby, or by any by-law of the adjoining municipality proposing to levy contributions towards the cost of such works, would be entitled to have the adjoining municipality restrained from passing a contributory by-law, or taking any steps towards that end, by an action brought before the passing of such contributory by-law.

At the recent convention of the American Society of Municipal Improvements held recently in Nashville, Tenn., the following Canadians were elected to membership in the Association: Mayor Gallagher, Quebec; Mayor Bingham, Ottawa; Charles McMillan, City Clerk, Calgary, N.W.T.; E. G. Barrows, City Engineer, Hamilton, Ont.; E. H. Keating, City Engineer, Toronto; Ald. Saunders, Toronto. Mr. Keating was subsequently elected 2nd vice-president, while Ald. Saunders was appointed on the Committee on Municipal Franchises, and Mr. Barrow on the Special Committee on Casting of Cast Iron and Steel Rivetted Pipe.

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* Paper read before the British Sanitary Congress.