

# The Canadian Engineer.

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## THE CANADIAN MACHINE SHOP

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CIVIL, MECHANICAL, STRUCTURAL, ELECTRICAL, LOCOMOTIVE, STATIONARY, MARINE, MINING, METALLURGICAL, AND SANITARY ENGINEER, THE SURVEYOR, THE MANUFACTURER, THE CONTRACTOR AND THE MERCHANT IN THE METAL TRADES.

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### ANNOUNCEMENTS.

#### CIVIL ENGINEERS' TOUR.

An inquiry from a well known engineer has just come to our desk, asking if the illustrated account of the Civil Engineers' trip through the North-West can be preserved in pamphlet form. We appreciate the confidence of our friend. What do others think?



### BOOK REVIEWS.

Owing to lack of space, we have been unable to review a number of very valuable books which have come to hand recently: on Metallurgy of Iron and Steel Modern Foundry Practice; Wireless Telegraphy; Railroad Construction; Practice of Surveying; Blacksmithing; Stationary Engineering; Machine Drawing and Construction; Field Engineering; Batter Tables, etc. This omission we very much regret, since the reading season is upon us; and some of these works would be profitable text books for our subscribers in the Universities. In December we purpose devoting considerable space to this department of our Journal.

## VITAL CITY PROBLEMS: SEWAGE DISPOSAL AND WATER PURIFICATION.

An eminent authority on sanitary science\* has recently said that

The ordinary function of a sewage works is, to produce without nuisance an effluent that itself is not liable to cause a nuisance when mixed with the waters into which it is discharged. . . . ; and that it is the province of a waterworks to purify water taken from rivers.

The City of Toronto in its existing waterworks system does not comply with the last named condition, for it has no provision for the purification of the water pumped out of Lake Ontario and delivered direct into the homes of the people; while if the daring new sewerage scheme of the City Engineer—now before the city fathers—is adopted (which proposes to discharge the triple-screened, untreated sewage into the lake at a point near one of the popular pleasure resorts, and to burn the coarse screenings on the spot), then, altogether new conditions, in the form of water pollution, will be introduced; which will be a constant menace to the health and physical wellbeing of the whole city. Surely, it is not necessary to add to the existing uneasiness about the city water, caused by the serious allegation made in "The Globe" of August 21st, 1906. Perhaps we had better quote:—

The water at the intake out in the lake has been kept comparatively free from contamination. The analysis made from day to day shows the water generally, so near to pure, that it is safe for all domestic uses. Such bacteria as are detected, however, were found on about 40 of the 365 days in 1905 to be due to sewage contamination. This pollution, though harmless in extent, (sic) may be attributed to the sewers opening directly into the lake, or to the overflow or current from the bay through the gaps.

If this be a true statement of the facts, then the city has not only to face the necessity of supplementing the proposed simple sewage disposal scheme with modern apparatus for destroying effectively the disease germs in the effluent, prior to its discharge into the waters of the lake; but have to face also, the need of a purification plant at the source of the municipal water supply. Recent science has made it possible to accomplish both these means of protection in a most effective and comparatively economic manner.

First, as to sewage disposal. The foremost sanitarians are agreed that the best means for destroying dangerous organisms in crude sewage is the use of chemical oxidizers, like chlorine and chlorine oxides. The only objection to their use, hitherto, has been their costliness; due to the inherent fault of all oxidants, that the larger part is consumed by inert matter before the reagent can act upon the bacteria. The latest suggestion, however, is that these reagents should be used as "finishers," after the organic matter in the effluent has been lowered to reasonable limits. At the Guildford Sewage Works (England) a series of experiments were made along these lines: electrolytic chlorine, or "oxychloride" being used. The treatment proved entirely practicable.† Now inasmuch as in the disposal of Toronto sewage organic purity is of less importance than the destruction of pathogenic germs, this method of treatment is worthy of serious consideration. It would not conflict with the City Engineer's scheme for triple-screening, and the burning of the coarse solids; but can be engineered in at the third screening stage without seriously increasing the estimated cost.

Now as to water purification. One of the signal triumphs of modern science is the discovery that ozone generated by electricity is a comparatively cheap and yet perfect means for the destruction of the most virile disease germs in polluted water. As far as we

\* "Pollution of Estuaries and Suggested Remedies," by Samuel Bideál, D. Sc., Lond. F.I.C. See "Times Engineering Supplement," Aug. 8, 1906.

† See Journal of the Sanitary Institute, Aug. 1905.