

TORONTO WATERWORKS REPORT DISCUSSED.

THE Toronto City Council has before it two reports on extensions to the waterworks system of the city. They are that submitted by R. C. Harris, Commissioner of Works, in January last, and an earlier one, presented in 1912 by a board of experts appointed in 1911 by the city. Summaries containing the fundamental points of each were published in *The Canadian Engineer* for January 22nd, 1914, and May 30th, 1912, respectively.

The later report severely criticized the recommendations of the former, and it has been, in turn, subjected to criticism of a somewhat similar nature by the engineers of the former investigating board. On January 24th, Willis Chipman, C.E., its secretary, forwarded a memorandum in which it was demonstrated that at an intake located opposite Victoria Park, the site recommended by the Commissioner of Works, the pollution of the water supply would be eight times that at the intake at Scarboro, proposed by the board of experts, this statement being based on the assumption that an intake crib be located in the same depth of water and at the same distance from shore at each of these two points.

A second memorandum forwarded by Mr. Chipman to the Board of Control recently, deals further with the two proposals. Following are interesting abstracts from it:—

"It should be noted that we recommended that the Scarboro crib be located 2 miles from shore, and at a point where the depth of water is double that at the proposed intake crib at Victoria Park. There can be no reasonable doubt, therefore, that the pollution of the supply through the Harris intake off Victoria Park, would be at least ten times greater than at the proposed intake off Scarboro Heights.

"Our designs for an intake crib have been most unfairly criticized. We did not state in our report that the structure was to be built within the harbor and floated to place, as illustrated in the diagram annexed to the Harris report. Intake cribs of the proposed height have not been sunk for waterworks purposes owing to the fact that the water in the other great lakes in the vicinities of the large cities have not the depth of Lake Ontario at Toronto, but cribs of greater depths have been sunk at other places for bridge piers and abutments, of which full descriptions are available in engineering publications.

"We also, as a board, obtained offers from responsible and experienced contractors to construct an intake crib in this depth of water, whether built of concrete or steel, who were prepared to submit bonds as a guarantee that they would carry out the work to successful completion.

"We have been taken to task by Commissioner Harris for not having made a sufficient number of borings to determine the practicability of a tunnel at the depth proposed. In explanation I may state that it was not until the latter part of November, 1911, that the board finally concluded to recommend the Scarboro project, and as we were being urged by the council and the newspapers to complete our labors, and as it would have taken another full summer season to make the borings, we decided to submit our report, in which we expressed the opinion that shale of a similar character to that beneath Toronto harbor would be found beneath the lake off Scarboro, this opinion being based upon borings made by us at the Scarboro shore upon information received

from the geological survey at Ottawa, and statements made by Prof. Coleman, of the University of Toronto, who has made a special study of the Scarboro formations. The borings recently made by Smith and Travers have confirmed our opinion.

"The leakage into the tunnel beneath the harbor during construction was only about 350 gal. per min., a trifling amount. All the evidence points to the fact that the shale off Scarboro is of precisely the same character as under the harbor, practically dry and without seams or faults.

"If, however, borings should demonstrate that we made an error in judgment, there is no reason why the Scarboro intake crib could not be located in the same depth of water and at the same distance from shore as that now advocated by Mr. Harris. The Scarboro intake would then be about 7 miles from the point of pollution instead of 2½ miles.

"Before concluding our report we consulted one of the foremost tunnel experts in America, who visited Toronto at the request of the chairman of the board, examined our designs and pronounced them practicable.

Reservoir Supply.

"We propose to pump water to an elevated reservoir, not for the fun of seeing it run down hill again, but to supply all of the city north of College Street, and the higher sections not now receiving a city supply. The College Street line, which now divides the intermediate service from the lower service, was to be maintained for the present, but we anticipated that this line might be lowered; that is, some street to the southward might be adopted in the future as the northern boundary of the low level district, this lower district to be served exclusively by the present John Street station.

"Assume two municipalities, one, say, 200 ft. higher than the other—there can be no reasons advanced why they cannot be supplied by two independent pumping stations. Connecting the two systems by one or more pipes provided with check valves and gate valves, permits either area to be supplied from the other in case of emergency, as was done recently in the city of Montreal when portions of the city were supplied by the Montreal Water and Power Company.

"When enlarged and improved, the old works may be depended upon for a minimum of 60,000,000 and a maximum of 90,000,000 gal. per day. The John Street system will then meet the demands of a population of something over 500,000, which will probably be reached within the next few years.

"The supply from Scarboro reservoir might, however, be drawn upon in case of a break-down in the John Street system.

"We did not recommend or propose that the entire water supply should be pumped to a height of 370 ft. We did not propose that the new reservoir should be operated in connection with the present city system, nor with the Rose Hill reservoir, excepting in case of emergency, and all of Mr. Harris' assumptions respecting the overflowing of the Rose Hill reservoir and the interference at the John Street pumping station, rendering the old plant useless, are simply nonsense.

"In regard to reservoirs, Commissioner Harris cites several large cities without reservoirs, but he fails to state that in each of these cities there is no ground of sufficient elevation upon which to construct a reservoir. It is hardly necessary to call attention to the fact that we did not recommend the city of Toronto to construct