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SEWERAGE, SEWAGE DISPOSAL, WATER SUPPLY AND WATER PURIFICATION

FORT WILLIAM WATER SUPPLY.

A detailed history of the many and somewhat exceptional struggles experienced by the city of Fort William in order to obtain a good and adequate water supply forms an interesting and very instructive paper, recently laid before the Canadian Society of Civil Engineers.

The subject matter (compiled by an associate member, H. Sydney Hancock, city engineer of Fort William), presents a careful study of the many difficulties in connection with water supply which are particularly found in Canadian Western towns isolated from manufacturing centres, and accompanied by the difficulty of procuring capable and skilled labor.

The past four years have witnessed an expenditure of over $500,000 in the fulfilment of a scheme to lead to the city by gravitation an ideal potable water from a lake, situate six miles from the city, 332 feet above Lake Superior, and which, because of its hilly and rocky environment, has received the familiar name of Loch Lomond in preference to the original Indian name, which resembles a series of unpronounceable sneezes.

It is calculated that the lake will be capable of supplying the city, in a maximum dry year, with 9,000,000 gallons per twenty-four hours, or sufficient, at sixty gallons per head, for a population of 150,000 people. It certainly looks as if the citizens of Fort William need have no anxiety as to their near future water supply.

The most costly feature of this water supply has been the construction of a tunnel about a mile in length; and, although the citizens have long recognized that Loch Lomond would eventually form their permanent source of water supply, the mining of this topographical barrier proved "a stumbling-block to the small population for many years." June of last year, however, witnessed the opening of the valve which allowed Loch Lomond to flow through the newly-constructed tunnel, and so into the city mains.

In spite of the fact that bids were first obtained for the tunnel section, the Water Board determined to do the work by day labor under Mr. Hancock's direction. Details of all costs and methods of construction have been noted, and form not the least valuable part of Mr. Hancock's contribution.

Before the tunnel could be constructed the city made use of a small lake, called Crescent Lake, about midway between the city and Loch Lomond, and it is in connection with the use of this water, that we have presented the history of a series of difficulties and failures, in the use of wood stave pipes for pressure main purposes, which eventually led to litigation between the firm supplying the pipes and the city. Fourteen pages of the paper are devoted to the "wood pipe" difficulties.

Approximately 10,000 feet of 18-inch wood pipe was laid under a total head of 300 feet, the wire spacing on the pipes being increased as the head diminished.

In October, 1906, the city paid the pipe company $5,000 of the total charge of $9,500 for 7,000 feet of the pipe purchased by the city. The company entered action against the city for the balance. The reason for the retention of the balance was, "as alleged," the impossibility of obtaining tight joints, and that leaks were no sooner repaired than others at once appeared. Mr. Hancock states that altogether 3,000 leaks were stopped, or, approximately, an average of three leaks for every joint. Mr. Keating, who was called in as an expert in connection with the trial, reported that the main showed a total leakage at the rate of 15,400 gallons per hour, or 369,600 gallons per day.

The result of the trial was judgment in favor of the city, the Chief Justice stating in part: "I find that the defendants relied on the plaintiffs' skill and judgment to supply pipes fit for the purpose required, and that the pipes were purchased by the defendants relying upon statements and warrantees made by plaintiffs that such pipes would give satisfaction, and would fill all requirements. I find that the pipes have not filled such requirements."

The points stated by the company in their action were briefly as follows:—

1. The pipe was well made and delivered in good condition.
2. That in numerous other cases it had proved successful for similar purposes at equal or greater pressure.
3. That it had been exposed to the atmosphere for too long a period.
4. That the pipe had been mishandled.
5. That it was not perfectly laid.
6. That the excavation was largely through solid rock, and the pipe insufficiently protected from jagged edges.
7. That the backfilling was carelessly done, and large boulders had been thrown on the bare pipe.
8. That it had been backfilled while empty, and was left too long in the trench before being filled with water, causing it to flatten out and lose its circular shape.
9. That the expert sent from the factory was an employee of the contractors, and the company were in no way responsible for his actions.

The case for the city was based primarily on the guarantee contained in the various letters leading up to the purchase. It was also stated that 90 per cent. of the trouble was experienced at the joints and not in the pipe itself. As to exposure to the atmosphere, it was pointed out that the company had shipped the pipe on flat cars from Vancouver, involving a journey of from three to five weeks through a variety of climates, totally unprotected from climatic conditions, and that evidently they did not consider exposure injurious. As to the injurious effect of solid rock, it was demonstrated that less than 200 feet of solid rock trench was encountered on the line, and that