

gent civil engineer, who wrote to me saying that there was no room in Canada for experienced waterworks superintendents, because the colleges were turning out yearly more students than there were such places to fill. If the students fill such positions raw from the colleges, without learning the trade and securing working experience, whatever salary or wages they receive, it is little better than robbery of the ratepayers. A valuable engineer never attempts to construct, or even manage the construction of systems that have been planned and laid out from his own ideas. He keeps his position, and expects the mechanic and manager to faithfully keep his.

Mr. Mansergh, in his fifteen-thousand dollar report on Toronto waterworks, expressed himself in a way that can only be interpreted to mean that he considered the construction and management of all American waterworks systems of a low standard. He attributed the reason to the fact that the city of Toronto had to pump over 100 gallons of water for each inhabitant each day, to waste or misuse—adding the important remark, as in other American cities. (See copy of report in the *Surveyors' Journal*.) The reason why there is a low standard of public works in this country in comparison to the works in the old country, is because there is no proper check placed on the local authorities by the Government. A single ratepayer having a substantial grievance and who can prove that the local authorities are wasting public money, or mismanaging the public business, or allowing the public works to be mismanaged, or voting themselves funds, etc., can petition the English Local Government Board, who will send an expert engineer to make a full inquiry, and if abuse of the trust put in the representatives elected by the popular vote be proved, or it is found that any of the officials are not worthy of the confidence placed in them, he will report the same to the Government, who will take measures to correct the evil.

I was appointed to investigate a waterworks on which there had been an inquiry of this kind, and I proved that most of the wealthiest manufacturers were daily stealing large amounts of water, and that less than half the amount of water provided by the ratepayers of the town was paid or accounted for. The result of the Government interference in this case was a saving to the public taxes of about \$30,000 each year afterwards.

Mr. Griffith, C.E., states that under proper management the advantages of local authorities owning their own waterworks are as follows:—

1. A local authority elected by residents in the districts has a greater personal interest in the matter of supply, and is better qualified to administer the undertaking in their own interest than a private company, whose only object is profits.

2. A local authority need not make any profit out of the supply. They can also borrow capital for construction of the works cheaper than a private firm and reduce the charges for supply to consumers accordingly.

3. Public sentiment is always in favor of having such a universal necessary of life and health in their own hands.

The chief difficulties against public ownership are:

1. The periodical changes of council, and sometimes even the constitution, which often interferes with the continuity of a policy.

2. The liability of the works being handled by men appointed through society, family or political influences, in place of having skilled mechanics and experts.

3. The habit, which is sometimes allowed or blindly ignored, of selling favors and accepting perquisites, which often is the cause of scamp work being done, and of public works costing more than similar works done by private business firms, or such well conducted councils as Glasgow.

The revenue from the sale of water in Toronto is stated in the newspapers to be \$445,000; taking the population at the highest stated number, viz., 190,000, it runs about \$2.30 per head; an average for each house of five inmates of \$11.50. They say we owe on account of the waterworks \$3,817,287.32, or an average per head of \$20.09. Had the Toronto waterworks been constructed and managed by a business firm with the ability of the T. Eaton Co., for example, it would not have cost half, and the charge to consumers could have been proportionately less.

There cannot be a great difference between the need for water in European and Canadian towns which have similar conditions, only that English towns use a great percentage of their water in supplying cheap public swimming baths of large dimensions. The difference in consumption has no connection with the fact that the heat or cold is more excessive, because the returns given us of the water pumped in Toronto in the months of April and November, when there is no garden or street watering, public water fountains, no frost needing taps to be kept running, nor anything at all different to any British town, gives only a little different figures to those published for any of the other ten months.

Mr. Palmer, C.E., states that the Malvern authorities supply each water consumer with a meter, and the average consumption is $5\frac{1}{2}$ gallons per head per day. I know several small towns that do not use meters which use less than 6 gallons of water for household purposes per head per day. The total quantity of water used for all purposes in the town of Nottingham, with a population of 250,843 last year, was stated to be under $21\frac{1}{2}$ gallons per head per day. In Bradford, a town of 240,000 inhabitants, they used 26 gallons per head through meter for manufacturing purposes, and about 27 for all other purposes, including several large swimming baths. Mr. Bateman states that he tested a group of 14 towns in England, and found the average consumption for all purposes was 24 gallons, and in a single group of working class houses, containing 82 inmates, the average consumption per day per head was $7\frac{1}{2}$ gallons. I myself tested a house in Toronto by having a new Siemens water meter fixed on for five years. The house had eleven inmates, two baths, one basin, w.c., hot water and range boilers, hose pipe, stable and horse. The average amount of water taken each year was under 28,000 gallons, less than 7 gallons per head per day.

The *Toronto Star*, on May 1st, stated that only 198,000,000 gallons of water were sold to manufacturers in a year in Toronto, or under three gallons per head, leaving about 100 gallons per head per day for sanitary and domestic consumption, or 75 gallons over the consumption of similar British towns. If Toronto were situated in England, there would be a government inquiry into the cause of this waste. Returning again to the mechanical and engineering side of the subject, as I have before stated, the best water for public use is rain water collected from clean land, because it cannot possibly be contaminated by mineral, manurial or sewage deposits. Taking a supply from a river near its source, or from an elevated lake, is often as good as collecting rain water. When taken from a