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### THE WATER SUPPLY AND DRAINAGE SYSTEM OF TORONTO.

The City of Toronto took advantage of the presence of Dr. Carpenter to get a report from him on the quality of the water which the citizens are obliged to drink. And from McAdam, of Edinburgh, a report on this and a related subject, the disposal of the sewage of the City, was obtained. Dr. Carpenter made his tests with permanganate of potash. Nobody supposed that the water of the Bay, into which the sewage empties, is pure; and the report of the tests, as far as this goes, is what might have been expected. The best samples, including that obtained at the bell-buoy, "did not compare well with pure water." Dr. Carpenter was disposed to conclude, "that all the water in the Bay" is more or less contaminated with organic matter, and probably in a degree dangerous to health. He found the worst water in the neighborhood of the Don, the drift of which he thinks is westward: "this is especially dangerous." The serious thing is that "the water as drawn at the bell-buoy is by no means free from contamination and other impurities;" and to make it worse it "becomes mixed on its passage from the bell-buoy to the pumping house with the bad water in the bay." There are supposed to be leaks in the pipes and in the well at the end of the wharf pumping house. In London, England, monthly tests are made of the water supplied by the eight companies by which the city is supplied; and Dr. Carpenter recommends that this practice be adopted in Toronto. Contaminated water is sure to produce fever sooner or later.

Mr. McAdam's report is the complement of that of Dr. Carpenter. Mr. McAdam examined the water as served to the citizens, as well as entered upon the consideration of the disposal of the sewage. He found much deposit at the bottom of the well at the pumping house, "composed of organic growth and organisms characteristic of putrescent organic matter of the nature of sewage." There were "impurities of a gross character," and Mr. McAdam is of opinion that the city should not be served with water "drawn from a well containing such putrifying deposits." The pipe that runs across the bay though said to be tight, at present, is, in his opinion, the chief offender, but that there is also "leakage in the ground surrounding

the tank," alongside the wharf. The report describes the water as "suspiciously dangerous," at present, and liable to become still more contaminated by an increase in the leakage. The pumping station, it is pointed out, should be on the island, whence the water should be forced through pipes directly into the city. But would the pipes not still be liable to leak? To prevent this the wooden pipes would have to be changed for iron pipes. The source of supply remaining where it is at present, the water before being pumped up should pass through sand and gravel filters. This, we are told, "would render it impossible for any of the sewage impurities in the bay to enter the city pipes or tanks by leakage or otherwise."

For the disposal of the sewage Mr. McAdam recommends a plan which is in successful operation in many parts of great Britain. "The present mode of the disposal of the sewage," he remarks, "is extremely primitive, and independently of the pollution of the water supply must be immediately dealt with. The bay is becoming grossly polluted, and the putrescent debris must evolve noxious gas and organisms to the serious impregnation of the atmosphere of the city. The continuance of the discharge of the sewage of the city along the foreshores should therefore not be allowed. The remedial work should include a main intercepting sewer which would convey the sewage some distance out of town, and the sewage should then be pumped up and distributed over land of a sandy and gravelly nature by the process of intermittent downward filtration, whereby the sewage is deprived of its noxious elements, and the land can be utilized for growing crops." This is a matter which cannot be trifled with; the health and lives of the citizens call for prompt and vigorous action on the part of the authorities.

### THE COMPETITION IN SUGAR PRODUCTION.

Jamaica and the other British West India Islands are not the only sugar-producing countries that are feeling the pressure of the competition between beet and cane sugar. The pressure is being felt everywhere, and perhaps not on one side much more than the other; for the beet sugar manufacturers, in pressing their rivals, are feeling the effects of the pressure themselves, in almost, if not quite an equal degree. If beet sugar manufacturers have rather had the best of the contest, they have run their best race, but it seems probable that advantages are within the reach of their rivals of which the cane-sugar growers and manufacturers have not fully availed themselves.

The sugar growers and refiners of almost every country are at their wits' end to find some means of counteracting the consequences of the fall in the price of sugar. The Belgian refiners, like the sugar producers of the British West Indies, favored an international convention to devise some means of placing them on an equality with the refiners of France and Germany. But this being impossible, they next, following in the footsteps of Jamaica and other British West India Islands, call for countervailing

legislation, as the only means left of placing them on the equality after which they aspire.

The *Journal des Fabricants de Sucre* says the large sugar refineries of Germany were last year making a profit of a little over 10 per cent. For some time previous to 1883, the central refineries of Martinique made a profit of 11.5 per cent., but last year the profit fell to 7.30 per cent. The number of sugar mills, in that colony, has fallen from 579 to 510. The division of labor is separating cultivation from fabrication, on the small plantations, where both had been carried on together for two centuries. The change will bring greater perfection in the manufacture. The imperfect means employed, in the old processes, would not extract more than 6 per cent. from canes which were capable of yielding 15 to 18 per cent. The canes which the growers sell to the manufacturers are grown for weight, when the price is low and naturally the quality is inferior. This is the reason given for the decline in the profits of the central sugar mills of Martinique. And the yield of the cane in Guadeloupe is still less. The fabrication of cane sugar in these French colonies is in a state of transition. The change is from small to large establishments, from comparatively rude to the best machinery, from an ignorant to an intelligent direction. These economical reforms would probably not have been brought about, even at this late day, but for the pressure of competition offered by beet sugar. One reason why beet sugar has been sold so cheap is that the beet has been cultivated with great care in Europe, and the sugar has been made by the best machinery. Among the reasons why cane sugar has lost ground are that sufficient attention has not been paid to growing good canes, and the processes of manufacture, in small establishments have been defective. Cane sugar has some lost ground to make up; but it is doubtful whether the manufacture of beet sugar can be made more perfect. The ultimate conditions of the competition have not yet been reached; and there is a possible margin in favor of the cane which has yet to be taken advantage of.

It would be a mistake to suppose that the growers and manufacturers of beet sugar have not felt the effects of the competition in which they have been engaged. Many of the German sugar manufacturers have reduced the price which they paid for beets; and it is uncertain how many cultivators will continue to produce beets at present prices. At least it is probable that there will be a considerable decline in the production. In some cases the reduction has been submitted to, rather than bring the sugar mills to a stand; in others the prices offered have been refused. In Austria, a like reduction in the price of beets has taken place; in Bohemia there has been a considerable reduction; in Austro-Hungary a similar state of things exists. France chooses to prop up her sugar industry by costly fiscal regulations which keep it artificially in a condition to which it could not naturally attain. In Bohemia, a reduction of the wages of the men employed in the sugar mills has begun. Persons interested in the production of cane sugar would fain see in these facts the beginning of the decadence of