

pipes and reservoir. The reservoir is 213 feet higher than the McTavish reservoir, or 418 feet above the harbor, and it is situated on the mountain side just above the McTavish monument in the line of Peel street. Its capacity is one and three-quarter million gallons. The high and low level distribution pipes overlap each other throughout a considerable area, which is determined by the different pressures required for domestic and fire service. Roughly speaking, the low level pipes reach up to a line running along just below the west end of Sherbrooke street to Mountain street, thence above Sherbrooke through the McGill College grounds to the upper side of Pine avenue at Durocher street, and thence diagonally to St. Denis at St. Rachel. Up to this contour, which averages about 70 feet below the McTavish reservoir, the houses are supplied by the low level pipes, but the water pressure near the line, although fairly efficient for domestic purposes, is quite insufficient for fire protection, and the pipes of the high level system are therefore extended considerably farther down, and have the hydrants connected with them. The hydrants, for instance, on Dominion Square, and even some of those at the Bonaventure station of the G.T.R., are supplied by high level pipes. The water pumped by the high level engine averages  $1\frac{1}{4}$  million gallons per day, and as it is first pumped by the low level pumps, it is of course included in the low level records also. The pipage and house services, together with the expenditures and other statistics of the high level system, are also all included in the general waterworks statistics.

#### MANAGEMENT.

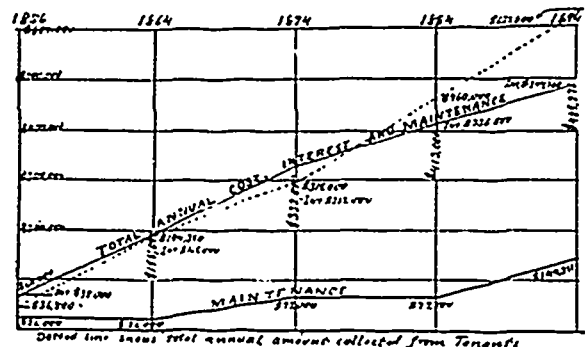
The general management of the waterworks is under the control of the water committee, which is appointed by the city council yearly, and consists of seven of its members. The moneys for working and maintenance expenses are granted by the city council, usually in one sum for a year. Such moneys come out of the revenue of the works, or, in other words, the water rates, and are paid out by the city treasurer on warrants drawn by the water committee, and charged up in the waterworks accounts under the head of Administration. Moneys for new works, such as additions to the pipage, pumping plant, reservoirs and aqueduct, are also voted by the council at intervals, and more or less specifically as to items, but for such purposes the moneys are taken from the proceeds of city loans for waterworks purposes, and are charged up in the waterworks accounts under the head of loans. They, therefore, represent capital expenditure, and their accumulated amount at any date is the total cost of buying and building the works up to that date, as distinguished from the cost of running them. It is the custom in the waterworks accounts, as also in those of the city treasurer, to make no deduction from capital cost for pipes and pumping machinery, or other important items, of the plant which have become worn out or obsolete. One large water-wheel, a whole set of water-power pumping machinery, two complete steam pumping engines, an auxiliary engine, and many miles of distribution pipes have been thus demolished or abandoned within a few years without being written off the capital, while the cost of the new machinery and pipes, which were substituted, have been added. Such new items, large though they be, are incident to the maintenance of the works in efficient state, are in fact large repairs, and might, therefore, so far as they merely replace the old, be charged to maintenance expenses in order to correctly show what maintenance costs. The income of the waterworks is almost wholly derived from the water-rates paid by consumers. These are collected by the Finance Department by means of a special staff of clerks and collectors, whose salaries are charged up to the Finance Department, and not to the waterworks. The immediate management of the works, and of the officers and men for working them, is in the hands of a superintendent, who is an engineer holding his appointment from the city council, but acting in all ordinary matters under the direction of the water committee. At present, strictly speaking, there is no superintendent: the duties of the office are performed by Mr. Laforest, who was assistant superintendent for several years, and has recently been appointed acting superintendent by the council. The incumbents of the office have been as follows:—Mr. Leblanc, superintendent of the old works previous to 1856; Mr. Louis Lesage, from the starting of the new works in 1856 until his death in 1889; Mr. B. D. McConnell, from promotion from assistant superintendent in 1889 until his voluntary resignation in 1892; Mr. A. Davis appointed in 1892 and dismissed in 1895; Mr. J. O. Alfred Laforest, formerly assistant superintendent, appointed acting superintendent, 1895.

The entire official and working staff averages about 350, and is made up as follows. The superintendent, assistant superintendent, 3 draftsmen and 5 clerks in superintendent's office. One guardian and two assistants on the aqueduct. One chief engineer, 4 assist-

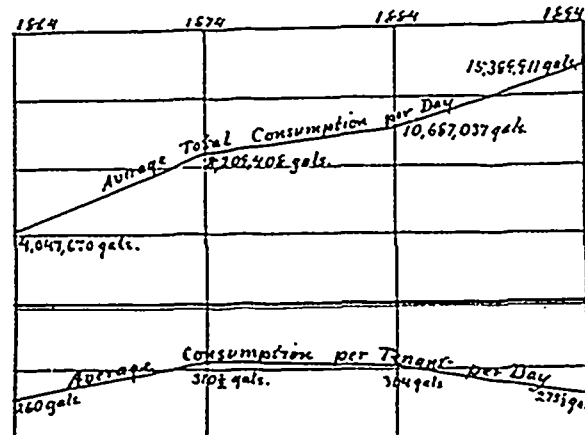
ant engineers, 5 oilers, 9 stokers and others at the low-level pumping station. One foreman and 16 others in the brass foundry and shop at the low-level pumping station. One engineer, 1 assistant and 1 stoker at the high-level engine-house and McTavish reservoir. One general foreman over city pipage works. One foreman in repair shop, Lagauchetiere street, 10 turncocks, 4 hydrant inspectors in summer and about 25 in winter, six house service inspectors; 250 sub-foremen, mechanics and laborers. Besides this strictly waterworks staff, there are about 18 clerks and 20 collectors in the waterworks' branch of the city treasurer's staff.

Water is furnished to citizens under a tariff of charges established by the city council. By far the greater part is furnished for domestic use, and for this the annual rate is  $7\frac{1}{2}$  per cent. of the rental, with certain additional charges for baths, etc. For stores and offices the rates are \$4 upon a rental of \$50, \$5 on \$75, \$6 on \$100, and \$1 upon every \$25 additional rental. In all these cases the charge is against the tenant. Payment is compulsory, whether water be taken or not. No person is allowed to draw water for himself or others from the river, nor to buy it from the works by meter for ordinary domestic use. For engines, elevators, factories and other industrial uses, it is supplied through meters, and charged under a sliding scale of rates from 30 cents per 1,000 imperial gallons for less than 1,000 gallons per day, to 15 cents per 1,000 for 9,000 gallons, or over, per day. For building purposes, garden-hose, and sundry other temporary or annual wants, water is supplied at specially prescribed rates. The tariff charges include all the obligations of individual citizens arising from the waterworks. There is no charge for hydrants, and nothing is charged under the guise of general tax for interest, sinking fund or the like. St. Denis Ward alone is excepted from the general tariff, it being supplied with water through a company under a contract made before its annexation to Montreal.

The accompanying diagrams show the growth and cost during the last forty years:—



	Total cost of works.	Av. capital cost per tenant.
1856 .....	\$ 637,719	....
1864 .....	2,452,000	\$139.45
1874 .....	4,247,000	160.50
1884 .....	6,101,460	173.60
1891 .....	8,619,000	154.32



#### SUBURBAN SUPPLY.

The belt of separate municipalities which completely encircle the city, except on the river side, and which are peopled by the city's overflow, are supplied by a separate waterworks system which merits a few words: With all the municipalities which touch the city's boundary, and with several beyond, a company, formed some four years ago, called the Montreal Water and Power Co., has contracts for supplying water for 50 years, commencing about 1891. In the case of Westmount and some others, the con-