the most trouble being lead which had run into the pipe at a joint. The water issuing from the open end of the pipe was the color of ink for from five to ten minutes after the scraper had passed through, and it was permitted to run until it became clear, after which the section of pipe was replaced and the valves opened. Some difficulty was experienced from the stopping of service pipes and house plumbing by rust forced into the pipes by the pressure of the water following the scraper, but this difficulty could be generally overcome by applying a force pump to the house plumbing and forcing the obstructions back into the main.

By this method the tubercles were removed from 58,000 feet of 6-inch pipe at a cost of 14 cents per foot, and from 20,300 feet of 12-inch pipe at a cost of 20.6 cents per foot. These prices include 5 cents per foot royalty paid for the right to use the scraper.

As was the case at St. John, a great improvement was made in the delivering capacity of the pipes by the removal of the coating of tubercles. Experiments were made to determine the friction in the pipes both before and after cleaning under different rates of discharge. The discharge was measured by means of a Deacon meter, and the friction head from readings of Bourdon gauges attached to the fire hydrants. Very great accuracy was not expected in these experiments, but they show very well the great loss in discharging capacity, caused by the coating of tubercles and the gain from the cleaning. It will be noticed that the discharge of the 6-inch tuberculated pipes was from 25% to 35% of the quantity which a clean-coated pipe might be expected to deliver under the same head, and that the discharging capacity of the pipe was more than doubled by the removal of the tubercles.

TUBERCULATED PIPE, 38 YEARS OLD—LENGTH, 525 FEET; ORIGINAL DIAMETER, 6 INCHES.

Observed Head. Feet per 1,000.	Velocity. Feet per Second.	Observed Discharge. Gallons.	Value of c in formula $v = c\sqrt{RI}$.	Calculated discharge of clean pipe under same h'd Darcy's formula.
1.30	0.38	33.3	29.5	120
2.50	0.57	50.0	32.2	165
6.90	0.95	83.3	32.3	275
14.40	1.13	100.0	27.1	395
19.20	1.32	116.6	27.1	455
25.40	1.51	133.3	26.8	525
33.80	1.70	150.0	26.1	600