

Moved by Alderman Douglas, seconded by Alderman Taylor that, Alderman Hubley, Kelly and Shaffner be the Committee on Juries Lists. Motion passed.

Moved by Alderman Johnson, seconded by Alderman Taylor, that the Council do now adjourn. Motion passed.

Council adjourns 12.20 o'clock.

EVENING SESSION.

8.10 o'clock.

COUNCIL CHAMBER, CITY HALL, March 31d, 1908.

A special meeting of the City Council was held this evening. At the above named hour there were present, His Worship the Mayor and Aldermen Archibald, Shaffner, Whitman, Johnson, Chisholm, Taylor, Douglas, McManus, Hubley, Kelly, Martin, Hayward, Murray and MacKenzie.

The Council was summoned

(a) To consider a Message from His Worship the Mayor in reference to water supply; and

(b) To consider the following item on the Order of the Day, viz. referred consideration of reports Committee on Works and City Engineer re tenders for water meters. November 8th, 1907.

(c) To proceed with business standing over and the transaction of other business.

PRESENTATION OF PAPERS.

The following named papers are submitted:—

Report Committee of Fire Wards covering accounts by Alderman Johnson, Chairman.

His Worship the Mayor submits the following named papers:—

Message from His Worship the Mayor covering various letters, reports, tables and blue-prints and extracts from reports and opinions of experts relating to water supply.

Report Chief of Police re violations of Liquor License Act on Sunday.

Letter County Councillor Lydiard re fares on Dartmouth Ferry.

Acceptance by Church of England to offer of \$3,750 00 for strip of land for widening Coburg Road.

Petition for concrete sidewalk Prince Street.

Petition in re application of Dillon Brothers et al, for certain liquor licenses, covering draft Act.

NOTICES OF RECONSIDERATION.

Read No. 1, viz: Alderman Hubley's notice of reconsideration of application of Catherine Dillon for a Liquor License, February 11th, 1908.

Moved by Alderman Hubley, seconded by Alderman Archibald, that said matter be now reconsidered.

Motion put and lost, 4 voting for the same and 8 against it, as follows:—

For Reconsideration	Against it.
Aldermen Archibald, Whitman, Douglas, Hubley—4.	Aldermen Shaffner, Johnson, Chisholm, Taylor, McManus, Kelly, Martin, Hayward—8.

Read No. 2 on Order of the Day, viz:

Alderman Martin's notice of reconsideration of application of Catherine McIntyre for a Liquor License. February 25th, 1908.

Alderman Martin stated that as the Council had now decided to grant the full number of licenses permitted by Statute it would be useless to reconsider the application upon which he had given notice.

The item is dropped.

Read No. 3 on Order of the Day, viz:

Alderman Taylor's notice of reconsideration of application of W. J. Coles for a Liquor License, February 25th, 1908.

Alderman Taylor made a similar statement to that made by Alderman Martin, and he item is dropped from the Order Paper.

Read No. 4 on Order of the Day, viz:

Alderman Hoben's notice of reconsideration of resolution providing for an annual grant for the Provincial Exhibition Commission. February 25th, 1908.

Alderman Hoben not being present, the item is dropped from the Order Paper.

His Worship the Mayor now reads and submits a Message on the City Water supply covering various letters, reports, tables and blue prints and extracts from reports and opinions of experts.

[For His Worship the Mayor's Message and the papers, &c., covered thereby, see appendix to the printed Minutes of this year.]

During the reading of His Worship's Message, Aldermen Hoben and Davison arrived and took their seats in Council.

Moved by Alderman Johnson, seconded by Alderman Murray, that No. 14 on Order of the Day, viz: Deferred consideration of reports Committee on Works and City Engineer re tenders for water meters, Nov. 8th, 1907, be now taken up and considered together with His Worship's Message. Motion passed unanimously.

The said reports are now read.

Moved by Alderman Murray, seconded by Alderman Johnson, that said reports of the Committee on Works and City Engineer re tenders for water meters be adopted.

Moved in amendment by Alderman Hoben seconded by Alderman Hubley that the further consideration of this matter be deferred until this day six months, and that in the meantime a rigid house to house inspection be inaugurated to detect any alleged waste of water.

Amendment put and lost, 4 voting for the same 10 against it, as follows:—

For the Amendment.	Against it.
Aldermen Whitmen, Hoben, Hubley, Davison.—4.	Aldermen Shaffner, Archibald, Johnson, Murray, Chisholm, Taylor, Douglas, Kelly, Martin, MacKenzie.—10.

Moved in amendment by Alderman Hoben, seconded by Alderman Hubley that the reports be referred back to the Committee on Works to call for new tenders and report.

Amendment put and passed, 8 voting for the same and 6 against it, as follows:—

For the Amendment.	Against it.
Aldermen Shaffner, Whitman, Chisholm, Hoben, Kelly, Hubley, Davison, MacKenzie.—8.	Aldermen Archibald, Johnson, Murray, Taylor, Douglas, Martin.—6.

Moved by Alderman Hoben seconded by Alderman Martin, that the Council do now adjourn. Motion passed.

Council adjourns 12.10 o'clock.

MESSAGE

FROM

HIS WORSHIP THE MAYOR

R. J. MacIreith, Esq.,

IN RE

WATER SUPPLY

OF THE

CITY OF HALIFAX,

Submitted and Read at meeting of City Council,
March 3rd, 1908,

ALSO

*Various letters, reports, blue prints and extracts from reports
and opinions of experts relating to Water Supply.*

MAYOR'S MESSAGE re WATER SUPPLY.

MAYOR'S OFFICE, CITY HALL,

HALIFAX, N. S., March 3rd 1908.

To The City Council:

GENTLEMEN,—In laying before you two communications from the Board of Fire Underwriters, dated February 4th and 24th, 1908, respectively, in reference to our water supply for fire protection, and also a letter dated March 2nd, 1908, in reference to the same subject, from the President of the Robert Taylor Shoe Company, the premises of which Company were visited by fire on the 7th instant, I feel it incumbent on me to once more draw your attention to a matter of vital importance to Halifax and its citizens.

Before taking up the water supply question proper, let me trace for you the various steps in the burlesque which has been perpetrated up to date, or, in other words,, outline the difficulty there has been in even proceeding thus far to the consideration of our water supply problem.

In the year 1904 the water supply being found inadequate for fire protection and even insufficient for a proper domestic service, a great many more than the usual number of complaints reached the Works Department. Finally, the situation became so serious in the opinion of the Board of Fire Underwriters that they addressed a communication to the Council on the subject threatening an increase of insurance rates.

This letter was referred to the Board of Firewards at a meeting of Council, held May 26th, 1904. On June 23rd following the Special Committee on Water Supply, consisting of Alderman Cawséy, (Chairman), Geldert, Campbell, Taylor, Doyle, Hayward and Messrs A. L. Wood and W. J. Clayton, reported to Council that after thoroughly going into the question they "were of opinion that the sources of supply of both high and low water services are ample for the City's needs at present and for a long time to come," and recommended among other things that drastic measures be taken to check the waste by consumers; and further recommended the employment of a competent outside hydraulic

engineer to make a report. The report of this Committee was unanimously adopted.

No definite action having been taken by the Board of Firewards or the Council on the letter of the Fire Underwriters read in Council at its May meeting previously referred to, the Fire Underwriters published the following notice:

The Nova Scotia Board of Fire Underwriters having decided to prepare a new specific rating for the City of Halifax, have authorized for the benefit which it had been decided to add to rates on schedule rated mercantile of the general public the publication of the following memo. of charges risks and proportionately to rates on risks endangered by such.

These charges will be added to the final rates of such risks, and in the event of the civic authorities carrying out the improvements called for, to the satisfaction of this Board, an allowance or deduction will be made in the rates on such rated risks corresponding to the charge made for specific item which may have been satisfactorily improved.

MEMO. OF CHARGES.

1st. That until an independent report is secured by the City on the water supply system, and its recommendations carried out.....25c.

2nd. That until an 80 ft. turntable aerial truck is obtained and a ladder division of eight men (call-men) provided 5c.

3rd. That until more street fire alarm boxes are procured and all the keys of boxes are kept under glass at the boxes, and tappers placed in the houses of call force..... 5c.

4th. Until either two water or two tug boats are fitted with fire pumps and hose, and permanently engaged, or two new steam fire engines (800 gallons capacity or more) are provided to work at salt water from floats..10c.

(a) This charge to be made (in full) only on mercantile RISKS on Hollis Street and east thereof from Fawson Street to Buckingham Street10c.

(b) On Barrington Street and Lockman Street, and east thereof from Buckingham St. to Artz Lane.....10c.

(c) West of Barrington Street to both sides of Argyle Street and Starr Street, a charge of 5c. is to be made for this deficiency5c.

5th. Until the Engineers of steam fire engines are permanently employed (sleeping in the engine houses) twenty more men added to the strength of the Department, and the Fire Department horses are utilized for Fire Department purposes only, and under the control of the Fire Chief10c.

6th. Until provision is made by law for a fire inquest whenever called for by either the Civic authorities, the Board of Trade or the Board of Fire Underwriters5c.

Three different classes, viz:

1st, 60c.; 2nd, 55c.; 3rd, 50c.

The rates fixed by the new tariff will (on schedule rated mercantile risks) also be subject to definite reductions for improvements in the fire hazard in individual cases.

This increase in insurance rates being a very serious matter for the mercantile community and real estate owners, evidently moved the Council to act, for at a meeting held a few days later, November 10th, 1904, by unanimous vote (fourteen members being present) it was decided to engage the firm of Snow and Barbour to report on the water system. At a Council meeting, held a week later, the then Mayor vetoed the resolution engaging the firm of Snow and Barbour. A motion moved by Aldermen Hubley and Doyle to confirm the resolution over the Mayor's veto was lost, ten voting for and three against—not being a two-thirds' vote of the whole Council. Nothing further appears to have been accomplished until February 9th, 1905, when the following resolution, passed at a public meeting of citizens, was read in Council :

WHEREAS, There has been for some years an inadequate supply of water for domestic purposes, especially in the more elevated portions of the City, many ratepayers are cut off entirely during the summer season as well as during the severest weather in winter. This not only causes great inconvenience, but endangers the health of our people and is a cause of depreciation in the value of real estate. We are menaced with a greater danger, that is, the difficulty of coping with fire, not only on the outskirts, but with a general conflagration in the congested portions of the City.

AND WHEREAS, The Board of Underwriters have recently increased the insurance rates enormously, with the understanding that the rates will be materially reduced should an adequate water supply be provided;

THEREFORE RESOLVED, That this meeting call the attention of the City Council to this matter, and point out the urgent necessity of some immediate action being taken.

After the reading of this resolution, a special committee consisting of Alderman Cawsey, Mr. W. J. Clayton and the City Engineer was appointed to consider applications received from engineers to report on the City water supply and report to the Council. The Committee, on February 14th, 1905, reported recommending Willis Chipman, C. E., of Toronto, who was appointed.

Mr. Chipman began his examination of the water works system in April, 1905, and his report was submitted to Council April 4th, 1907. When transmitting it, I accompanied it with a message pointing out the urgency of the matter, and asking for early and serious consideration.

From that day until the present moment the only step the Council has taken has been to recommend the appointment of an additional Water Inspector. In the meantime the community has been carrying the load of increased insurance rates, portions of the

City have been at times totally without water for domestic purposes, and still larger areas have not even had an apology for fire protection service.

Thus it will be seen how much time has already been wasted, or worse than wasted, as each day's delay has meant great loss to our citizens, and it is to be hoped that something real will now be done.

Whether or not the Council may see fit to act is of course a matter entirely for itself; but in so far as I am concerned I shall feel that I have done my duty and if a serious conflagration takes place, perhaps wiping out hundreds of thousands of dollars worth of property in a few hours, as has been the experience of other cities, the responsibility for failure to remedy the inefficiency of the water supply cannot rest with me.

I suppose when the Council unanimously decided to employ Mr. Chipman and authorized expenditures exceeding five thousand dollars it was at least convinced of the absolute necessity of doing something to improve the water service, and I suppose it is further fair to assume that the Council intended to act upon the recommendations of the report of Mr. Chipman when it should be presented.

The water works system of Halifax has been so often described in the various reports of the City's engineers, and more recently in the very excellent paper of Assistant City Engineer Johnston, read before the Nova Scotia Institute of Science, in January, 1906, which was published with the Engineer's last Annual Report, that it does not seem necessary that I should again go over that ground at any length. But in order that those members of the Council who have not had an opportunity of studying our water system and who may not have sufficient knowledge thereof at the present time to properly deal with the question under consideration, I will outline briefly the history of our service.

In the year 1844 a Company was incorporated by the Legislature of Nova Scotia known as "The Halifax Water Company," for the purpose of supplying the City with water, and the water was first turned on to the City in 1848. Before installing the system, the Water Company obtained the reports of eminent engineers of that day as to the supply which would be required, and as to the best place to obtain that supply. The population of Halifax at the time was from twenty to twenty-five thousand, and the number of water services likely to be required within the next five years was estimated at about fifteen hundred.

Mr. John B. Jarvis, a prominent engineer of New York, estimated that two hundred gallons per day would be an ample supply for each service pipe, equivalent to forty gallons per capita for each user, estimating five persons to each family, or a total for two thousand services of four hundred thousand gallons per day.

Mr. Jarvis recommended that a 12-inch pipe, capable of discharging seven hundred thousand gallons per day when incrustated should be laid. The pipe was, therefore, estimated to deliver 300,000 gallons more than could be legitimately required.

About the year 1850 complaints commenced in reference to the poor pressure, and in 1854 the directors of the Water Company, replying to a communication of the City in reference to the low pressure, stated that the difficulty was caused by the great waste of water by the water users. The directors of the Company having decided it advisable to further increase the supply, employed Mr. James Forman, to make an examination of the Lakes and report, which he did in August, 1855, and in 1856 it was finally decided to lay a 15-inch pipe from the lakes to the City, and at the same time a resolution was passed that a strict supervision should be had to prevent excessive waste of water. Still apparently the waste continued and the pressure remained poor, and this was the state of affairs when the great fire of 1859 took place. This conflagration brought the City Council of the day to its senses. Smarting under the fire loss and the criticisms of the citizens, the Corporation finally approached the Water Company, and bought it out on the 5th of August, 1861.

From the time of the transfer of the works to the City until the year 1872 the management was in the hands of a Board of three paid Water Commissioners. In 1872 it was vested in the Board of Works. Before the purchase of the water works by the City, Mr. James Laurie, C. E., of New York, was employed to report on the increased source of supply, and in 1863, acting on Mr. Laurie's report, the original 12-inch main was taken up and a 24-inch main laid in its stead. In 1865 on account of complaints of poor pressure in the high district, the Water Commissioners employed Mr. W. B. Smellie to make surveys, and in his report he recommended the laying of a 15-inch pipe from the Spruce Hill Lakes to St. Andrew's Cross, which pipe would be capable of delivering two and a half million gallons every twenty-four hours to

the higher levels of the City. In 1866 the whole matter was referred to Mr Thomas C. Keefer, who reported in September of that year, and it will be seen on reference to his report that he considered 50 gallons per day a liberal supply for each consumer. A main was finally laid from Spruce Hill Lakes to the City in April, 1868, and is to-day the main from which the High Service supply of the City is drawn. Once more, on account of the excessive waste, complaints of poor pressure began, to remedy which the Council commenced passing resolutions ordering the High Service supply to be let down to the lower levels—until it became almost demoralized. At this time the two mains—the 24-inch and the 15-inch—combined were delivering over seven million gallons daily and still the pressure was altogether inadequate for fire protection, owing to the fact that in spite of the repeated warnings of the Engineer of the time, Mr. E. H. Keating, regarding the waste, nothing was done to check the same. The consumption was 200 gallons per head per day. In 1893 the City Council, rather than follow the unpopular course of stopping the waste by installing meters at an appropriate cost of \$60,000, decided to lay a new low service main into the City from the Chain of Lakes, 27 inches in diameter, costing \$155,000. This plan was not recommended by the City Engineer. This main was brought into the North end of the City along Bayers Road and Young Street to Gottingen Street, and there connected with the existing main by a 24 inch main through Gottingen St. to Cogswell Street.

Thus the low service supply is furnished by a 24-inch main from the Chain Lakes, in Quinpool Road to St. Andrew's Cross, and a 27-inch main from the Chain of Lakes to Gottingen St. at Young St. These two mains together are capable of, and do bring into the City, between ten and eleven millions of gallons of water daily—sufficient to supply, as will be shown later, not only from the opinion of experts, but from actual results in other cities a population of one hundred and eighty thousand. In addition we have the 15-inch high service main from Spruce Hill Lake through Quinpool Road to St. Andrew's Cross, supplying 2,500,000 gallons daily, sufficient to supply a population of 45,000, or in other words, a supply which should be amply sufficient, without the low

(NOTE.—Consumptions given are taken from winter supply and are made up from blue prints attached and in round numbers).

service pipes spoken of at all, to provide a domestic supply for a City the size of Halifax.

Spruce Hill Lake is 363 feet above M. L. T., and Long and Chain of Lakes, from which the low service is taken, are 206 feet above M. L. T.

The general elevation of the City is from 150 to 170 feet above M. L. T. while the elevation of Hungry Hill, the highest point in the City, is 247 1-2 feet. The highest point supplied at the present time with water is Willow Park, 225 feet above M. L. T. Thus it will be seen that Spruce Hill Lake is at an elevation of 115 1-2 ft. higher than Hungry Hill, and if the water in the high service main was not drawn off, it should rise to a point at least 100 feet higher than that Hill, making ample allowance for the loss of head owing to the friction in the pipes. At times the fire plugs at Willow Park show practically no pressure, though the Lake is over 130 feet higher than any of them.

Again, notwithstanding the fact that the lake is 100 feet higher than any of the houses in Willow Park, it is impossible sometimes, for days at a time, to get water in the basement, the householders having to draw their water supply at night.

In 1867 the low service supplied about 22,000 consumers and furnished water to houses in districts as high as North Park St. To-day, though the water supplied from the low service lake has been largely augmented as we have seen above, and the number of consumers is 2,000 less, we are, nevertheless unable to reach points with the low service supplied by it in 1867. In other words, six million gallons supplied 22,000 people and reached points as high as North Park Street in 1867, while today, with a daily supply of ten million gallons, and only 20,000 consumers, this service will not reach points supplied by it in 1867.

Now, from actual measurements, we note, as has been already stated, that the two low service mains supply over ten millions of gallons daily, and the high service main two and a half millions daily, or a total of 12,500,000 gallons supplied by the three mains.

The total population of Halifax by the last census was forty-one thousand, and the number of people supplied from the City's water service is estimated to be thirty-six thousand five hundred. Therefore, the daily consumption of water per capita in Halifax is 304.9 gallons or 342.4 gallons per consumer.

Separating the two services, which are, of course, distinct, the following result is found:

The low service mains, with 20,000 consumers, deliver ten millions of gallons daily, which is equal to a consumption of 500 gallons per consumer per day.

The high service, with 16,500 consumers, delivers two million five hundred thousand gallons daily, equal to a consumption of 151.5 gallons per day.

After having carefully studied every report on water works or water supply available to me, whether appearing in the reports of Water Commissioners of the various cities of the Dominion and the United States, or as papers read before meetings of the Water Works Association of America, as well as articles contributed to the various magazines devoted to hydraulic engineering and water supply systems, and the standard text books on the subject, I find that all the authorities seem to agree that a supply of sixty gallons per head is ample for the legitimate needs even of the chief manufacturing cities.

Further, I have taken the trouble to communicate with the Mayors of the different cities in the Dominion and the United States, with a view to obtaining information as to the amount of water consumed by them, and especially cities situated as regards temperature as nearly as possible like our own. And here I have to acknowledge the uniform courtesy and willingness of the various Mayors and Water Departments of the different cities communicated with to furnish the information sought.

From the replies received a table, at page 41, has been prepared showing the actual water consumption of the different cities named, and showing at the same time the number of meters used in each.

Also annexed to this report is a table, see page 46, showing the daily per capita consumption of the leading cities in Europe. From the first table it will be seen that the average consumption, where meters have been applied to check the waste, even in manufacturing cities like Fall River, etc., is under fifty gallons per day; and it will be noticed further that the highest consumption of any City in Canada in the table falls far short of the consumption in the City of Halifax, page 47.

While statistics from the other side of the Atlantic are perhaps not worth as much to us for the purpose of comparison as those from the cities in this Continent, it is yet worthy of note that in cities like London, the consumption is only about twenty gallons

per head. It would therefore appear that the opinion of the experts fixing sixty gallons per head as an ample supply for all purposes is an outside estimate for this City. Applying these figures to Halifax it will be seen that we should be able to comfortably get along with about two and one-half million gallons of water per day, or about the volume of water supplied by the 15-inch high service main alone. Then what must any man who gives the matter any thought or study think? What must the members of the Council think? What must any citizen of Halifax think? When he is brought to realize that in addition to the high service supply, which alone should be almost sufficient for all the legitimate domestic needs of the whole City, two low service mains, one a 24-inch, the other a 27-inch pipe, are supplying over ten millions of gallons per day over and above the amount of all the water required for legitimate purposes. In other words, adopting a plan of calculation, sometimes used, when considering financial matters, Halifax is using daily 304.9 gallons for every man, woman and child in the City, or 1,525 gallons for every family in the City; or each man, woman and child is daily using six oil barrels or one hundred and fifty-two buckets of water; and each family is using thirty oil barrels, or seven hundred and sixty buckets of water per day.

Applying the same test to the low service alone, we find that each man, woman and child supplied from that service is daily using ten oil barrels or two hundred and fifty buckets of water, and each family is using fifty oil barrels or twelve hundred and fifty buckets of water per day.

When one stops to think that before the installation of the water system in cities and towns it was necessary to draw water from wells and whole families were able to comfortably get along with from ten to twenty buckets of water per day, the absolute and scandalous waste at the present time becomes quite apparent.

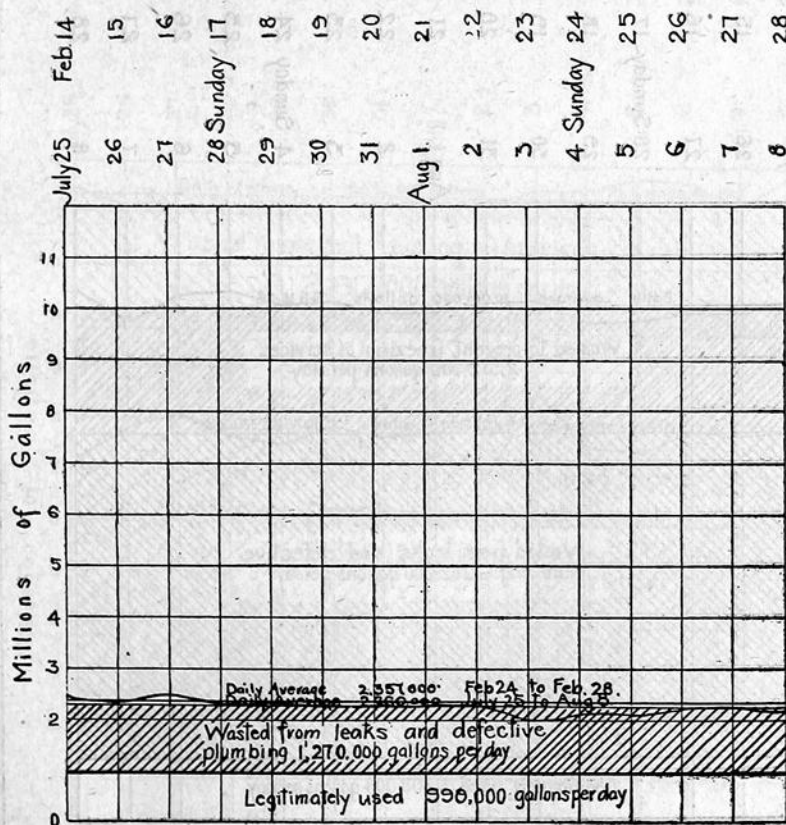
Or, in other words, we have coming through the 15-inch high service pipe a volume of water sufficient to supply a population of forty thousand; through the 24-inch low service pipe a volume of water sufficient to supply a population of 90,000, and through the 27-inch low service pipe water to supply a population of 96,000; or, in all, the three mains are delivering into the City of Halifax a quantity of water based on the computation of the experts sufficient to supply the manufacturing, industrial and domestic needs of a city having a population of over two hundred and twenty-five thousand, i. e., enough water to supply a City having a population

five times that of Halifax. In Halifax each person draws sufficient water to supply a family of five persons elsewhere.

In order that the extent of waste may be realized, I have had the Engineer prepare diagrams based on the meter readings for two weeks in summer and two weeks in winter, which are annexed hereto, and which show graphically the comparative volume of water used and wasted. The unshaded areas at the bottom of the diagrams show the estimated volume legitimately used and the shaded areas at the top of the diagrams the volume wasted. The straight lines show the average for the full periods of two weeks, while the thinner lines show the daily consumption. The upper shaded portion between the upper straight lines shows the difference in waste in summer and winter and represents the waste to prevent freezing. In the low service diagram it will be noticed that the waste to prevent freezing is a little more than double what the legitimate consumption should be.

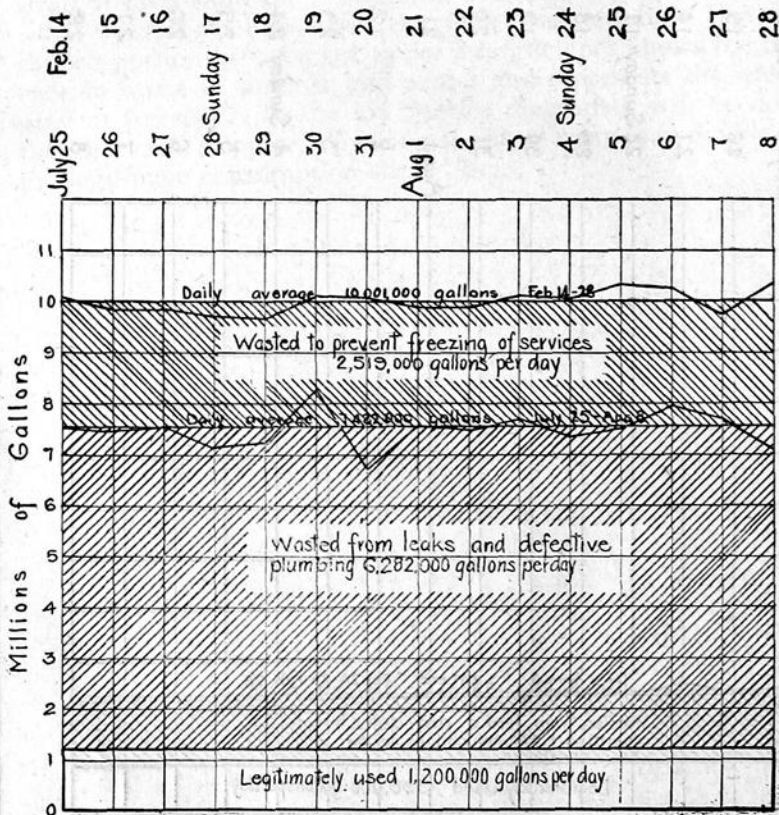
Two Weeks Winter and Summer use and waste High Service shewing Daily Quantity.

Diagram showing daily quantity of water used and wasted in the High Service system, Halifax, N.S. from Feb 14-28 and July 25 to Aug 8, 1907.
16,500 Consumers.

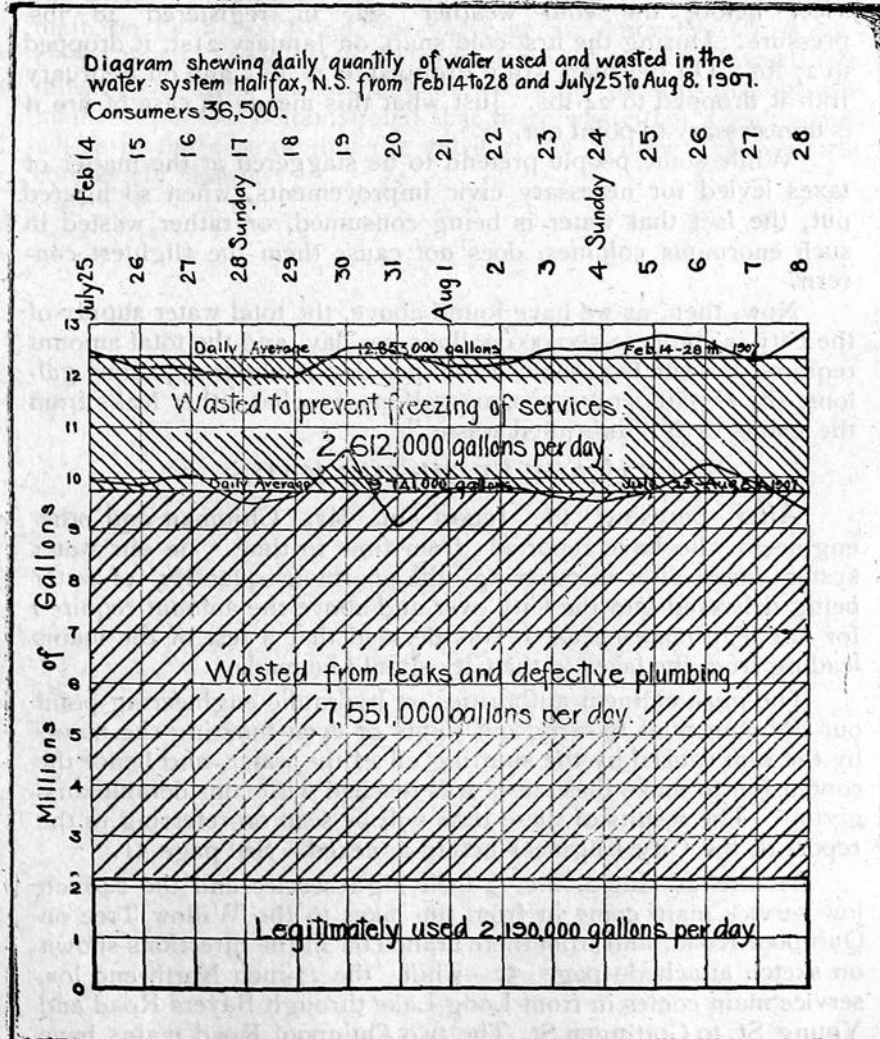


Two weeks Winter and Summer use and waste Low Service shewing Daily Quantity.

Diagram showing daily quantity of water used and wasted in the low service system, Halifax, N.S. from Feb. 14-28 and July 25-Aug. 8, 1907.
20,000 Consumers.



Two weeks Winter and Summer use and waste High and Low Services
showing Daily Quantity.



Another fact to which your attention should be directed is the drop in pressure occasioned by waste to prevent freezing. The water gauge in Foreman Morrison's house on the high service, before the cold weather set in registered 48 lbs. pressure. During the first cold snap, on January 21st, it dropped to 27 lbs. On February 5th it dropped to 26 lbs., and on February 10th it dropped to 24 lbs. Just what this means in case of fire it is unnecessary to point out.

While some people pretend to be staggered at the matter of taxes levied for necessary civic improvements, when so figured out, the fact that water is being consumed, or rather wasted in such enormous volumes, does not cause them the slightest concern.

Now, then, as we have found above, the total water supply of the City is about 12,500,000 gallons per day, and the total amount required for our legitimate wants per day is about 2,500,000 gallons, the remainder, 10,000,000 gallons, is what either leaks from the mains or is "unbridled waste."

LEAKAGE FROM THE MAINS.

After perusing the report of Mr. Chipman and other engineers who have reported from time to time on our water system, and after discovering the enormous quantity of water being delivered into the City over and above the amount required for our legitimate needs, it was decided that a test of the mains leading from the lakes to the City should be made.

The most eminent authorities on hydraulic engineering point out the danger of blowing out joints or even bursting the mains by the ram caused by the shutting off of the water, and hence the conclusion to make these tests was reached with considerable misgiving. The results of these tests will be seen on referring to the report of the City Engineer hereto annexed. See page 51.

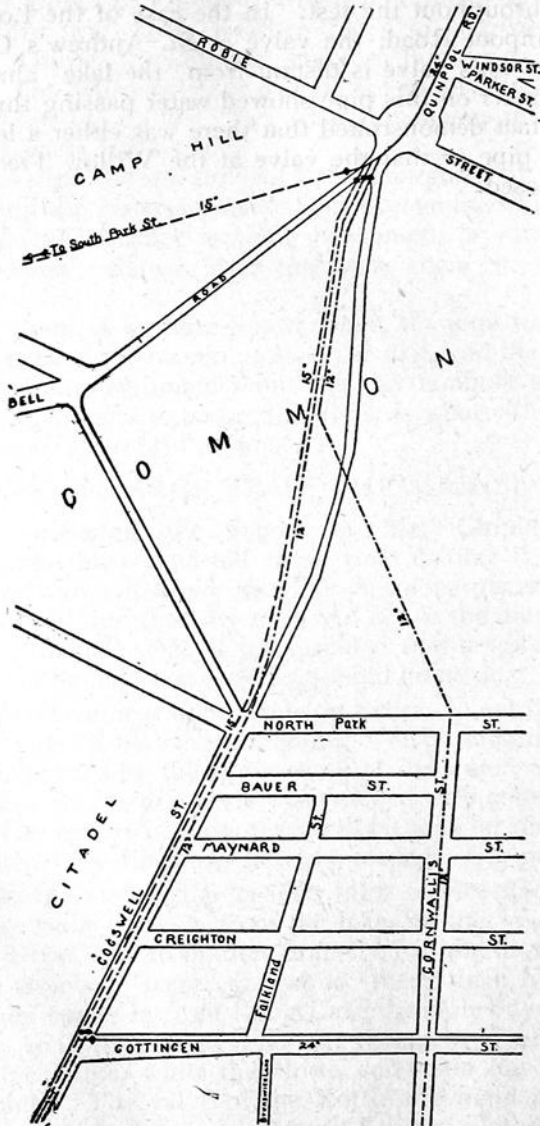
As already stated, the 15-inch high service and the 24-inch low service main come in from the lakes to the Willow Tree on Quinpool Road, and from there branch off in the directions shown on sketch attached—page 52—while the 27-inch North end low service main comes in from Long Lake through Bayers Road and Young St. to Gottingen St. The two Quinpool Road mains have wood wedge joints, while the North end main has "turned and bored" joints. The valve of the North end main was closed at the corner of Gottingen and Young Streets, almost three miles from the lake, and as in the case of the valves on the other pipes

was kept closed for a half hour in order that three readings of the meter at the lake (the meter reads every ten minutes) could be taken. This pipe was found to be absolutely tight, the meter standing at zero throughout the test. In the case of the Low service main on Quinpool Road, the valve at St. Andrew's Cross was closed down. This valve is distant from the lake almost three miles. The meter on this pipe showed water passing through the main. This fact demonstrated that there was either a leak somewhere in the pipe or that the valve at the Willow Tree was not completely closed.

For Service Distribution of Vancouver, B.C.



Sketch Shewing Low Service Distribution
At St Andrew's Cross



Low Service Distribution St. Andrew's Cross.

The report of Mr. Morrison, Foreman of Water Works Department, see page 53, who closed the valve at the Willow Tree, shows that the valve did not properly enter the seat and that water was passing through into the distribution main. A leak was found in the low valley at Dutch Village, caused by the blowing out of a wedge, which likely happened, as Mr. Morrison states, owing to the ram caused by the turning off of the water. As there was no water showing at this point a few hours before the test was made, while the next morning the water was found rushing up through the ground and running over the surface, it would seem to prove the Foreman's conclusion that the leak was caused by the ram. The main was at once repaired, and a further test was made. This time the valve at Willow Tree on the 24-inch main was not closed, as it was found impossible to shut it down completely, but instead the valves on the branch pipes (see sketch p) were shut, accomplishing the same purpose, or in fact, making a better test, as by this means a greater length of pipe was tested. Let me explain: At the Willow Tree the 24-inch main feeds four distributing mains—one crosses the Common to Cornwallis Street; two cross the Common to Cogswell Street, and the fourth crosses the Common to Sackville Street. The Cornwallis Street, Sackville Street and one of the Cogswell Street mains have valves on them at the Willow Tree. These were all closed. The other Cogswell Street main has no workable valve at the Willow Tree, but has one at the corner of Gottingen and Cogswell Street—about 2,700 feet from St. Andrew's Cross. This was also shut; and, by the way, the Cogswell Street main is the oldest pipe in use in the City, being a portion of the original 12-inch main laid in the year 1848 from the lake to the Willow Tree when the water system was first introduced. When the 24-inch main was substituted for the 12-inch main sufficient of the 12-inch pipe was used, 3,200 feet, to carry the main to the foot of Cogswell Street. The result of this test was that the 24-inch main was also found to be absolutely tight, as well as the main from the Willow Tree to Gottingen Street.

As appears from the Engineer's report previously referred to, the 15-inch high service main was also tested and a small leak was discovered, which was subsequently repaired; but no further test was made, as the risk of a serious break, likely to be caused by the test, was too great to make a further test desirable, especially as the leak found on the first occasion was so small. From this test, therefore, it is abundantly clear that the leakage

from the mains between the meters at the lakes and the point of distribution in the City is practically nil.

As to the condition of the distribution mains in the City, while no one can claim that they are absolutely tight, it may be useful to inquire into the state of the pipes wherever they have been exposed during the past few years.

Last summer it became necessary in carrying out some of the suggestions of Mr. Chipman, as to the laying of larger mains, to replace some of the smaller mains in use, to expose a considerable portion of our water pipeage. On Morris St. 398 feet of the 9-inch main was uncovered, taken up and a new 12-inch main laid in its place; and on Lockman St. the 6-inch main from Proctor Street north to North Street, 2,187 feet, nearly all laid previous to 1867, was also taken up and a new main substituted for it. As will be seen by the report of Mr. Morrison, Foreman of the Water Works Department, page 54, as well as by the report of subforeman McLean, see pages 55 and 56, both these mains which had wood wedge joints were found to be absolutely tight—not even a drop of water being found escaping from a single joint. During the past three years new service pipe connections have had to be made on Hollis Street, Pleasant Street and other streets where permanent pavement and sidewalks have been laid, in all 948 connections, every one of which made it necessary to go down to the main, and there was not the slightest evidence found of any leaks. It should also be pointed out that the men of the Water Department are continually exposing the main pipes arising from the putting in of new service pipes, 352 new service pipes having been put in during 1905-06-07. From the subjoined statement of the Foreman engaged in this work, see pages 57-58 it will be seen that although the main was exposed in at least 1,300 places as above they ran across no evidence of leakage from the mains or the service pipes. It would, therefore, seem clear to an unbiased person that the underground leakage in Halifax is very small, and that the enormous volume of water used, or rather wasted, over and above the proper and legitimate requirements of the City is mostly due to “extravagant waste” and “waste” alone.

As some doubt has been expressed whether or not it is possible to waste so large a quantity of water through the ordinary plumbing fixtures as is wasted in Halifax, I had the Engineer make a test in the City Hall. As will be seen from his report, at page 59, the 80-gallon meter measuring tank was filled through a half inch pipe in five minutes and seventeen seconds, the pres-

sure being only 24 pounds. At that rate 458 service pipes would deliver 10,000,000 gallons, about equivalent to the low service supply, in twenty-four hours.

Now, having reached the conclusion that "waste" is the cause of our trouble—what causes it? Defective plumbing; leaky fittings; "hopper" water closets; and carelessness in allowing the water to run through the open taps when not required for legitimate purposes.

This is being the case, what is the remedy? Two are suggested—one "meters"; the other, "house-to-house inspection." The one a complete remedy; the other only a very temporary and partial one.

On the question of stopping waste I prefer to be guided by those whose business it has been for years to make a special study of the problem, and I submit, with all due deference to the Council, that the view of the experts and the advice of the experts and the course suggested by the experts is the view to take, the advice to follow and the course to adopt.

To this branch of the subject I have given a great deal of attention and study and have carefully read the numerous reports and papers on the subject, but in all my readings, and they were general, I did not find one expert or one single author or writer who had carefully studied the subject who reached any other conclusion than that "the installation of meters" was the proper remedy for waste.

HOUSE-TO-HOUSE INSPECTION.

The concensus of opinion on this matter seems to be that while a little good may be accomplished for a short time, that the results obtained do not justify the expenditure entailed. In order to be of any value it must be continuous and necessitates the employment of a large staff of inspectors. The frequent visits of the inspectors are found to be the cause of much annoyance to, and many complaints from the average householder and especially those who keep their plumbing in proper condition. It means that several times through the course of the year the inspector must go all over the houses tracing out and examining the fittings. After a while the inspector is considered such a nuisance that schemes to outwit him are resorted to. If he discovers waste a notice must be sent and after a reasonable time has elapsed he must return and see if the necessary repairs have been made. But then after all this, and no matter how careful the inspection, the

waste from the open tap or other fitting through neglect to turn the water off, goes merrily forward.

For the information of the members of the Council, I have appended to this Message extracts from the opinions of many of the Commissions and experts that I have been able to gather together on the subject; and I am satisfied that, after a careful perusal of them, any man must be forced to the same conclusion that I have come to.

In addition to the views of outsiders, I have also appended the remarks of our own engineers and those of others who have made a particular study of the Halifax water system. Also annexed to this Message will be found at page 61 a statement prepared from the water books showing that fifty services to which meters were applied were discharging 28,597,237 gallons in six months. Subsequent readings show that the consumers supplied through the same fifty services were able to comfortably get along with 3,886,105 gallons, a saving on fifty service pipes in a half year's consumption and waste of 24,711,132 gallons, equivalent to a daily saving, owing to the installation of 50 meters of 137,284 gallons, a quantity sufficient to supply about 2,300 people.

In addition to the above the Works Committee has had before it recently three bills—one for a small house on Maynard Street, showing a consumption for six months of 108,000 gallons; another a shop on Barrington Street, showing a consumption of 450,000 gallons for the same period, and a third, a house on Lockman Street, showing a consumption for the year of 673,000 gallons. all found due to waste.

Doubtless the two usual arguments will be made against the installation of meters, namely, first, loss of revenue; and, secondly, danger to public health; and also the third argument—the extra expense entailed.

Fortunately one is able to combat these arguments from the experience of other cities as in almost every case where the question of installation of meters has come up these two contentions have been advanced:

In Halifax it does not appear that as a result of the installation of meters our revenue will be materially decreased.

The City Collector's statement, at page 63, shows that at the present time we are annually receiving from various manufacturing industries and other premises, 565 in all, paying by meter, the

sum of.....	\$23,380.00
From domestic and special rates	37,665.00
From Fire Protection Rate	11,400.00

Total revenue from above sources\$72,445.00

Assuming that we will be able to reduce our water consumption to sixty gallons per capita per day, we will sell 2,700,000 gallons of water daily, equivalent to 985,500,000 gallons per year; of this total 256,533,000 gallons will be used for manufacturing and other purposes, as at present, and will yield a revenue annually of.....\$ 23,380.00

The balance, 728,967,000 gallons, will yield an annual revenue at present rates of 109,345.00
To which must be added the fire protection rate..... 11,400.00

Making a total revenue of.....\$144,125.00

Our revenue therefore after the installation of meters made up on the present charge for water would be \$71,680 in excess of the amount at present received, or just about double the amount at present received.

The probable income is made up at the rate of fifteen cents per thousand gallons because all services entitled to draw water at lower rates are metered at the present time.

The interest on cost of meters, installation, sinking fund, charges and maintenance, etc., was estimated by Mr. Chipman at \$16,000. Therefore, it will not be necessary to collect an excess of \$71,780.00 over present income, but only \$16,000 more. In other words, we shall have to sell water by meter sufficient with fire protection rate to yield\$88,445.00
Our present revenue from meter rates and fire protection rate is 34,780.00

We will therefore have to sell additional water by meter to yield\$53,665.00
Equivalent to 357,766,000 gallons per year equal to 980,000 gals. per day.

The total number of service pipes in use is7,165
Of which there are metered 565

The number of unmetered services being.....6,600
Taking the usual estimate of five persons to each service, these

6,600 services are supplying 33,000 consumers. A consumption, therefore, of 980,000 gallons per day by the present unmetered services would be equivalent to a per capita daily consumption of 29.7 gallons, as against 500 gallons per head used on the low service now.

This would make our total daily consumption for the whole City 1,682,830 gallons per day instead of a quantity in excess of 12,000,000 as used at the present time.

While it is not to be expected that there will be so great a saving at once, I only point out these facts to show how improbable the contention advanced by one or two opponents of meters is that by the adoption of meters our revenue will be gone.

An argument no doubt will be attempted to be made as to the effect on revenue from services already metered, and a comparison between the amount received from them through the meter rate and the former assessment rate. In this connection it may be pointed out that many of these meters have been placed at the request of the owners and are on premises where the plumbing is kept in good condition. The same thing exactly has occurred in other cities, but the loss has always been met by other consumers whose bills are more, and the general result of the adoption of meters has been a surplus in revenue, and a consequent reduction rather than an increase in the rates.

But assuming such an argument to be sound, the result would be that the saving in the consumption of water would be even greater than is claimed by the very highest authorities on water works operation, being in excess of 10,000,000 gallons daily, and only goes to accentuate the assertion that the waste of water in Halifax is scandalous.

If the installation of meters permits of a reduction in water rates it can be done on a proper and fair basis, while if an increase is necessary it can be fixed and in such a way that the consumer will pay for just what he uses and not be called upon to pay for the waste of his neighbor. But this phase of the question will be later dealt with under another head.

It would therefore appear that instead of having an increased water rate by meters in the future we would be able to reduce it and still have ample revenue from this source to pay the increased outlay made necessary by their installation.

This has been the general experience of other cities.

As to the second argument:

"That the application of meters has a tendency to make

" people so economical and frugal as to refrain from using enough water for the purposes of proper health and cleanliness."

A perusal of the reports of cities where meters have been adopted, annexed hereto, shows that the experience of all such cities is that such an argument is a myth.

It may, of course, happen that in a few isolated cases, consumers will be so penurious as to use an insufficient quantity of water, even though a thousand gallons of it, as is in the case of Halifax, is supplied for fifteen cents; but such people are like the lone sparrow on the house-top. Moreover, if any such thing should happen the matter is very easily adjusted by the application of a minimum rate system. This plan is followed in many cities where more revenue is a necessity, and is usually fixed at four dollars per year. In Halifax if a minimum rate was decided upon and fixed at four dollars for each service pipe, each consumer would be entitled to use, or rather each house would be entitled to draw 26,000 gallons of water per year, or 72 gallons per day, without paying additional water rate. At the same time, there would be no object in a person stinting himself in the use of water, as whether he used the 26,000 gallons or not he would have to pay the minimum rate just the same. In Halifax it does not seem to me that the application of the minimum rate will be found necessary because with the rate so low few persons will attempt to save the small amount that might be saved by a penurious use of water at the expense of health and cleanliness.

The third argument against the installation of meters will of course, be the "extra expense" entailed.

I suppose I may take it for granted that we all realize something must be done and done promptly in order to obtain an improved water pressure and a consequent reduction in fire insurance rates and that there are only two ways of obtaining this result, first, to check the enormous waste; or, secondly, look for another source of supply, and lay a main from such new source into the City.

As Mr. Chipman says in his report, "In Halifax it is either meters or an additional supply from Birch Cove Lakes with many additional large distributing mains."

Our present source of supply is already taxed to its utmost, and during a dry season such as was experienced in 1905, when we had to resort to pumping we are likely to have a famine.

As Mr. Chipman points out in his report at page 45, to bring additional water in from the only available source would cost

in the vicinity of \$300,000, but his figures are far too low, in the opinion of your Engineer, and to them must be added the cost of larger mains in the City, \$130,000 more. On this basis the annual charge would be \$27,800, according to Mr. Chipman's report.

If we had not more than ample water for our needs at the present time there might be some utility in considering the procuring of a further supply; but under the present conditions to do so would be almost farcical, were it not for the enormous expenditure entailed.

As Mr. Chipman says at page 41 of his report, "but as the present supply is ample for all requirements, further consideration of this scheme may be deferred until your City has doubled in population"; and at page 3, "The supply would be ample for all the requirements of the City if efficient means were taken to curtail waste."

The best illustration of the futility of laying another main under present conditions is to ask you to consider what happens when water is poured into a sieve. The taps and other plumbing fixtures in a very large number of the houses to-day may well be compared to the apertures or openings in a sieve, and the only effect of an increased supply would be to pour a still larger quantity of water into the sewers. This is demonstrated every time that one or other of the low service mains is shut off and turned on again. The two mains together do not carry the water much higher than one alone, though each of them delivers in the vicinity of 5,000,000 gallons daily, while the difference in pressure is insignificant compared with the pressure which should be obtained from the extra main.

The cost of installing meters depends on whether the whole system is metered or not. This is the course Mr. Chipman recommends and is undoubtedly the proper course to adopt. He estimates the cost at \$98,000 and the annual charges at \$16,000. On the same basis the low service alone could be metered at a cost of about \$60,000 with annual charges of \$10,000.

Of the two courses open to us the adoption of meters is, therefore the more economical, as well as being the course recommended by the expert.

What particularly strikes one is the difference in the per capita consumption in the high and low services, the high service being 151.5 gallons and the low 500 gallons. It was this enormous waste on the low service that demoralized the high ser-

vice. The high service was originally designed to supply only the higher levels of the City, but as the low service became worse from time to time, the Council, in opposition to Engineer Keating's repeated warnings, let the high service down until to-day, what Mr. Keating stated would happen, has become an accomplished fact. In several places it is down to points below 125 ft. above M. L. tide, and in one case down to a point only fifty feet above M. L. tide. There are to-day sixty services on the high service main below 125 ft., and five hundred and ten services between 125 ft. and 150 ft. above M. L. T. The low service lakes are 206 ft. above M. L. T. and should be available if the waste was stopped to supply all of these 570 services. Among these services are several large consumers, viz: The Victoria General Hospital, City Home, Dalhousie College, Home of the Good Shepherd (laundry) "Birchdale" and Convent of Sacred Heart, all on the high service, and consuming together about 75,000 gallons per day. One of these consumers is only 90 ft. above tide, while several others are at an elevation of slightly over 100 ft. Assuming the other 563 services are consuming water at the present average rate for high service consumption, we find that about 425,000 gallons per day is being used by them, making a total consumption by these 570 services of 500,000 gallons daily. Being on the lowest levels of the high service the chances are that these unmetered consumers use more than the average for the whole district.

All these services should be and could be supplied from the low service if the frightful waste were checked, and as a result the high service would be pro tanto improved. As the waste on the low service is checked the pressure will increase and the water will reach the higher levels, and as it is forced up the area now necessarily served by the high service will be reduced, with the result that the high service will be improved.

Whether or not the high service is ultimately metered, Mr. Chipman's recommendation that the lower levels should be metered first should be carried out and the whole low service metered. When this has been done there can be no doubt that the high service will have an excellent pressure and be ample for all purposes owing to the greatly reduced area it will be called upon to supply.

In addition to the metering of the low service, all houses having hopper or pan closets should be metered as they are found in almost every case to be the source of much waste. There are

506 of these on the low service and 155 on the high. In one case, in the south end, where a meter was put on one of these closets, was found to be wasting at the rate of 1,000 gallons per day, and afterwards averaged six gallons, owing to the care of the owner of the property. In another case of a Barrington Street property, now before the Board of Works, the waste was found by meter from the same cause to be 1,500 gallons daily, and many other cases can be cited.

INEQUALITY AND UNFAIRNESS OF FLAT WATER RATES.

This is a phase of the water question which should not be overlooked, and it must strike any person who stops to consider for a moment, as peculiar, that the man who uses considerable quantities of water for his lawns, gardens, etc., pays no more for the water he consumes than does his neighbor occupying very much smaller premises. Again, the man living in a small house, using water moderately, is called upon to pay for the water which his neighbor is allowing to run to waste.

The prominent writers and experts on this subject contend in unanswerable arguments that "water being a commodity and of a certain value per thousand gallons, should be sold the same as the grocer would sell any of his wares," and that a man should be required to pay not only for the water he requires for his legitimate use or needs, but also for the thousands of gallons he permits to run to 'waste' during the year."

If a man suffers water to waste then he and he alone should be fined for doing so. There is no equity or no reasonableness in the present system whereby all the other members of the community are fined for that enormous waste.

Therefore, two results on the application of meters would be realized; first, it would attack the waste of water and make practically every consumer of water a water inspector of his own fittings; and secondly, it would result in making each consumer of water pay for exactly the quantity of water which he uses legitimately or otherwise.

FIRE PROTECTION.

Coming now to the matter of fire protection, it should be pointed out that at the present time we are levying a fire protection rate on all properties within reach of our water mains, while in several districts of the City we are practically giving nothing in return for the people's money. This is shown continuously by

the hydrant pressures which are taken from year to year and a study of the return is somewhat startling. For instance, we have twenty-four hydrants showing a pressure of fifteen pounds or less, some of them being as low as five pounds. Of these hydrants some are located in important portions of the City. At the time these pressures were taken the guage in Mr. Morrison's house showed a pressure of forty-two pounds. Just what the pressure was on some of these hydrants when Mr. Morrison's guage dropped over twenty pounds, as it did several times during the present winter, can be as well imagined as described. What does this all mean in case of fire? Simply that until the fire engines get to work the Fire Department is helpless, and after the engines get to work there will not be water enough for them.

It is on account of this showing that the Board of Fire Underwriters inform us that they have increased our rate of fire insurance, and they inform us that when our water pressure has been placed on a proper footing we will receive a reduction of twenty-five cents on every hundred dollars of fire insurance; and let us pause to see what this means:

Take a prominent firm on Water Street carrying on real estate and stock \$160,000 of insurance. The increase to them means an extra tax of \$400.00 annually. Take the case of the citizen carrying insurance on real estate on Hollis Street amounting to \$140,000 paying an insurance premium of \$350.00 annually; or, if you please, take the real estate owner paying \$2.50 extra for every \$1,000 of insurance he carries.

This, it is unnecessary for me to point out to you, is a very serious matter to the mercantile community and to owners of real estate generally; and I can only express my regret that the Council has not grappled with it sooner.

Want of knowledge cannot be pleaded as an excuse, because for several years this state of affairs has existed. We might as well be frank and plainly admit that we have done nothing because we thought that the only remedy was and is unpopular. Personally, my stand has always been the same. I recommended the application of meters when a member of the Council as an alderman, something over five years ago; but rather than hark back to what has taken place in days gone by, it is perhaps better to "let the dead past bury its dead," and now deal with the matter promptly and seriously.

As appears from the report of the Chief of the Fire Department, at page 64, the Department has been seriously handicapped

for want of water at several fires. This is no new thing. The papers from time to time have pointed out that "the firemen arrived promptly on the scene, but the water supply was inadequate." Many of us have witnessed fires where hydrant streams were turned on before the fire engines could be got to work, and the water would not reach above the first stories of the buildings.

Every member of the Council realizes the necessity of the Fire Department. We are providing our firemen as they should be provided with the very best fire-fighting equipment; but while doing all this we neglect the most important fire-fighting factor, what the firemen need most, above everything else, namely:—a sufficient supply of water to cope even with an ordinary fire.

To quote the language of Mr. Chipman at page 2 of his report: "The City of Halifax has to-day the *largest per capita* consumption; the *lowest pressure* and the *weakest fire supply* of any Canadian City with which I am acquainted; and considering that a large percentage of the buildings are of wood, your preservation from a disastrous conflagration has been nothing less than miraculous"; and at page 3, "The City is practically without fire protection."

Coming from an outsider, the foregoing words of warning should be seriously taken to heart by the members of the City Council and the citizens of Halifax generally.

In the days of the old Water Company, while many complaints were made about the low pressure, the Council was not moved to act until the disastrous fire of 1859 forced them to act.

St. John, N. B., when swept by that fearful conflagration in 1876 found itself at the mercy of man's greatest servant, but worst master, owing to its poor water supply.

If a fire should break out in Halifax to-morrow we would practically be without water to properly fight it in certain portions of the City.

The success of our firemen under the present condition of affairs has been nothing short of "wonderful"; and, in the words of Mr. Chipman, our "escape from a serious conflagration seems to be nothing short of miraculous."

But, after all, is not our water problem in this position?—We have more than an ample supply of water drawn from sources at sufficient elevation to provide an ample fire fighting service; and our supply mains tight above the average. Having these conditions, how should we deal with the question before us? Should we take our own heads for it; or should we not rather follow the

advice of the men charged with the management of our water system at the present time and in the past; the advice of those who have come in and examined our system and reported on it, and the advice of experts all over the world which is open to us? Surely the answer must be that we should undoubtedly follow the advice of the "expert." It is his business and he has made a life-long study of the problem. In this case what does the "expert" say? "Stop the waste!"

"Are we prepared to stop it?" is the question.

In these days we hear a great deal about "Municipal Ownership," and we have among the members of our Council champions of Municipal Ownership.

The water works of a municipality, all authorities admit, is a fit matter for municipal ownership and operation, and it is agreed on all hands to be the simplest public utility to properly manage—more especially a gravity system.

Are we so managing the water works of Halifax as to show our fitness to manage other public utilities? Such as an electric lighting plant, etc.? (Would we sell electricity or gas by flat rate? If not, why not?)

At the last session of our Legislature we had a Bill before it seeking power and authority to do our own electric lighting, and to supply light, heat and power. When our Bill came up before the Committee of the House ex-Mayor Mackintosh pointed out the unfitness of the City Council to manage such a plant, giving as the basis of his argument "the manner in which we 'mismanage' such a simple matter as our water system.

We also must realize that if a private Company were operating the water works system of Halifax, or if any member of this Council owned and was operating the water works system of this City, the waste would be checked, and it cannot be denied that if a Company were operating our water system and giving such miserable fire pressure as we have to-day, the citizens of Halifax, as well as the members of the Council, would be up in arms against the Company, and would be found insisting that "proper and better fire service" be provided.

Just pause for a moment and assume that a Company was operating our water works system, giving hydrant pressure of 5 lbs. and less, and that the Fire Insurance Underwriters put in force a greatly increased tariff on account of the poor force of water provided, what would be the result? How long would the City Council or citizens put up with it? I say, then, that we are in

duty bound to place our water system in as good a position as we would expect a private company to put it in, and that we should not be afraid to adopt the methods that a private Company would adopt acting on the advice of the best "experts."

If we have not the courage to take the necessary step because that step would be unpopular, then we surely exhibit our total unfitness, not only to manage other public utilities, but also to carry on so simple a thing as the management of a water works system.

It would appear that there is only one step to be taken if something to improve the water works system is not done immediately, and that is, for our heaviest taxpayers, who are groaning under excessive fire insurance rates, to commence an agitation to have the water works placed under the management and control of an independent commission, as it was previous to 1872.

Mr. E. H. Keating, formerly City Engineer of Halifax, after calling attention for years and years to the excessive "waste" of water and suggesting the usual remedy to check it, in his last report, made in 1889, recommends that the whole management of the water works system should be placed under a commission of independent men who will not be afraid to do or be deterred from doing what is necessary in the interest of the water works system and in the best interest of the community because the step may appear to be "unpopular" for the time being.

To briefly sum up the matter, the following conclusions seem to be justified by the facts:

1. That the high service supply alone is delivering enough water for the domestic requirements, at least of a City the size of Halifax.

2. That the water being delivered by the two low service mains about represents the waste and leakage.

3. That the leakage from mains is very small and below the average.

4. That profligate waste is at the bottom of our troubles.

5. That increased pressure must be obtained.

6. That the bringing in of another main is unnecessary, too costly, and would not result in improvement under present conditions.

7. That checking the waste is the only proper remedy.

8. That this cannot be accomplished by house-to-house inspection.

9. That the installation of meters is the only course left open and is the most economical.

10. That the levying of a water rate by meter is the only fair and business-like basis and makes the consumer liable to pay for what he uses or wastes.

11. That there will be no loss of revenue, but rather a larger surplus, which will result in reduced meter rates.

12. That relief from increased fire insurance premiums should be obtained at the earliest possible day.

13. That water is indispensable to the Fire Department and that the Department is seriously handicapped at present owing to the lack of it.

14. That the metering of the whole low service should be begun immediately and that service should be all metered.

15. That by the metering of the low service many places on the high service can then be supplied from the low.

16. By reducing the number of services on the high and transferring them to the low service the former will be very much improved.

In conclusion, I have to express my regret at the length of this Message, but the importance of the subject and the necessity of laying all its phases before you made a full statement necessary.

Respectfully Submitted,

R. T. MACILREITH, Mayor.