

## REPORT OF CITY ELECTRICIAN'S.

CITY ELECTRICIAN'S OFFICE, May 24th, 1905.

*To the Chairman and Members of the Board of Fire Department :*

GENTLEMEN,—I beg to submit the following report respecting the Fire Alarm Telegraph System :—

The service during the year has been very satisfactory. The cost for repairs however, has been exceptionally high, due chiefly to the sleet storm of January 3rd and 4th. The accumulation of ice on the lines at this time was the greatest I have ever seen, small wires being coated to the diameter of  $1\frac{1}{2}$  inches. Fortunately there were very little wind blowing at the time or the damage would have been much greater. As it was the damage to the Fire Alarm System will be in the vicinity of \$1000.00, between \$700.00 and \$800.00 of which yet remains to be expended in permanent repairs.

The storage battery outfit and controlling board mentioned in last report have since been put in service and are operating very satisfactorily. The cost for charging (about \$5.00 per month) is excessive, owing to the only direct current supplied by the Tram. Co. being too high for number of batteries now in service ; besides the current is very unsteady necessitating more attention during charge. The waste of current will, however, be reduced as additional batteries are introduced when the contemplated installation of fifty tappers takes place, otherwise it would be in the interest of economy to instal a motor generator outfit.

The engine lathe and motor placed in Central Engine House this year are valuable additions to the equipment of the department.

The gravity trap locks for outside signal boxes have not yet been fitted, but I am advised by the manufacturer that they are nearing completion and will probably be installed during the summer months.

Authority has been granted by the previous Board and Council for the purchase and installation of the following apparatus :—

- 1 6 Circuit Automatic Repeater.
- 10 Signal Boxes.
- 50 Tappers.  
Line construction material for the above.
- Additional Battery Equipment.
- 20 Glass front key protectors.

The above will constitute a valuable addition to the signaling equipment of the department.

The destruction caused by severe sleet storms and the consequent interruption in the service merits the consideration of your Board. The only remedy that appears to be satisfactory is underground construction, and while it is expensive in first cost the increased reliability of the service together with the small cost for repairs would seem to make it of sufficient importance to warrant enquiry into. The Telephone Company are extending their underground system each year, and if some satisfactory arrangement could be made with them for the use of a duct so that a beginning could at least be made it would be a move in the right direction.

The signal boxes are being cleaned and where necessary repaired as opportunity offers and as soon as the locks are fitted they should be painted.

The following locations for the ten new signal boxes are submitted for your approval :—

- Morris and Edward Sts.
- Spring Garden Road and Birmingham St.
- Lower Water foot of Bishop St.
- Barrington and Prince Sts.
- Granville and Buckingham Sts.
- Agricola and Cunard Sts.
- Gottingen and North Sts.
- Campbell Road and Richmond St.
- Oxford St. and Chebucto Road.
- Louisburg St. and Jubilee Road.

The following list comprises the equipment of the Fire Alarm Telegraph :—

- 1 3 circuit automatic repeater.

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- 1 6 circuit automatic combination repeater and storage battery board.
  - 160 cells B. T. storage battery.
  - 23 miles of line wire.
  - 40 signal boxes.
  - 5 tower strikers and bells.
  - 2 18 in. gongs.
  - 4 15 in. gongs.
  - 1 12 in. gong.
  - 1 9 in. gong.
  - 7 8 in. gongs.
  - 1 5 in. gong.
  - 4 Tappers.

Respectfully submitted,

P. R. COLPITT,  
*City Electrician.*

# CITY ENGINEER'S REPORT.

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## CITY WORKS DEPARTMENT.

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### COMMITTEE ON WORKS, 1904-1905.

A. B. CROSBY, MAYOR, *Chairman.*

ALD. D. H. CAMPBELL,

ALD. W. S. ROGERS.

### OFFICERS :

F. W. W. DOANE, M. CAN. SOC. C. E., *City Engineer.*

H. W. JOHNSTON, *Assistant City Engineer.*

### WATER WORKS.

EWEN MORRISON.....*Foreman.*

D. P. O'NEIL .....*Plumbing Inspector.*

JOHN E. BURNS .....*Water and Meter Inspector.*

### STREETS, SEWERS, &c.

JOHN McDONALD.....*Foreman.*

### OFFICE.

JAMES J. HOPEWELL .....*Clerk of Works.*

MISS MINNIE HUNTER.....*Stenographer.*

## CITY ENGINEER'S OFFICE, CITY HALL,

HALIFAX, N. S., May 1st, 1905.

*To His Worship the Mayor :*

SIR,—I have the honor to present the report of the Department of City Works for the civic year ending April 30th, 1905, my fourteenth annual report:—

## WATER WORKS.

Amount of funded debt on Water Account .....	\$1,056,600 00
“ transferred from revenue.....	36,000 00
“ of debt redeemed by Sinking Fund.....	8,000 00
“ “ “ Revenue.....	30,000 00
“ “ “ premiums on loans....	4,073 33
	<u>\$1,134,673 33</u>
Amt. expended to April 30th, 1904....	\$1,128,153 02
“ refunded from revenue 1904-5....	5,976 40
	<u>\$1,122,176 62</u>
“ expended May 1st, 1904, to April 30th, 1905..	\$3,951 96
“ repaid 1904-05.....	371 52
	<u>3,580 44</u>
	<u>1,125,757 06</u>
Balance on hand.....	<u>\$8,916 27</u>

Amt. paid into Sinking Fund in excess of debt redeemed \$12,500 00

## COST OF MAINTENANCE, 1904-05.

Interest.....	\$47,142 00
Sinking Fund .....	2,625 00
Maintenance of System .....	33,744 77
	<u>\$83,511 77</u>

The increase in the maintenance expenditure is caused by the unusual quantity of work performed in the renewal of old mains. This extraordinary expenditure should not be charged to one year only in estimating the annual cost of maintenance, but should be averaged over a term of years.

Recently much has been written about Municipal ownership of public utilities, and opponents of the idea contend that it is impossible to carry on the affairs of a municipal department on a business basis, or in a way that would reflect credit upon the management if the department were a private business enterprise. It has been contended that public management is excessively costly and wasteful in comparison with private management.

Such is not the experience in Halifax. By reason of the application of business principles to the conduct of the affairs of the Water Department and the zealous and faithful services of the foreman the system has earned each year the entire cost of maintenance, renewals and repairs, with a margin of profit as well. These earnings do not include the value of the water used by the City for city buildings and work, public fountains, street sprinkling, sewer flushing and all other city purposes. If the value of the water used by the City is credited to the earnings of the Department, as it would be in the accounts of a private enterprise, the Water Department earns each year a handsome percentage on the total cost of the works in excess of the entire cost of maintenance.

At the same time the water rates are low in comparison with those of other places of the same or larger size. The mention of our minimum rate always causes surprise among officials in other cities.

A suggestion has been made recently for a reduction in the rates, principally for the benefit of one class of water takers. Such a policy would be objectionable and unwise. We need all we earn for renewal of old mains, connection of dead ends and other much needed improvements in the system. Another, and the strongest argument against any reduction in the rate is the certainty that the present revenue will not be sufficient to pay the additional annual expenditure if it becomes necessary to augment the supply. It would not be wise to make any change until this feature of our water works policy is determined. The reduction would no doubt be a vote winner among the class benefitted but would be most

unbusiness-like, and therefore unworthy of the support of those who really have the welfare of the City at heart.

If it can be claimed that the present low rate is a hardship on even the poorest, there is a remedy already available. Any householder who finds the charge of four dollars too large may apply for a meter and by a little care reduce his bill. Such a course has been adopted successfully by more than one water-taker already and more will follow as it becomes known that the meter is not so bad as it is painted.

#### NEW WORK.

There were seven petitions for the extension of main distribution pipes presented to the Council, and nine orders passed.

Extensions were made in five streets, one of which, measuring 154 feet, was in the low service district, the remainder, aggregating 998 feet, are high service. The total length of mains laid during the year was 7,968 feet, the total now in use being  $69\frac{3}{4}$  miles. Five thousand four hundred and sixty-two (5,462) feet of old three-inch pipe was renewed with four-inch and 1,354 feet with six-inch.

Twelve new main stop valves and four hydrant valves were placed in service and fourteen were replaced by larger valves on new pipe. The total number in use is 804.

Three old hydrants were replaced with improved City design frost jacket hydrants with steamer nozzles. Three new hydrants were installed, making the total 424. Two thousand four hundred and thirty-three (2,433) feet of pipe was laid for 67 new services and 1,730 feet of old service pipe was renewed.

#### CLEANING MAINS.

The low service supply main was cleaned on November 16th. The high service main was scraped three times, viz, on June 1st, September 1st and November 15th.

The most difficult work was the cleaning of the north end high service distribution main. Hatch boxes were constructed at St. Andrew's Cross, junction of Robie Street and West Street, intersection of West Street and Agricola Street, and intersection of Agricola Street and Bilby Street. The 12-inch pipe on Robie Street

(35 years old) was coated with tubercles about  $\frac{1}{2}$  inch in thickness, the space between the tubercles being filled with a soft black deposit. The coating was heavier, tougher and thicker at St. Andrew's Cross than at the West Street end. The iron was as good as new and not soft under the tubercles. On July 7th the scraper was run from St. Andrew's Cross to West Street, under a pressure of 42 pounds. It ran along easily and steadily, the valves being tight, and brought the deposit out ahead of it like porridge. It was run a second time on the same day. Two or three days later the West Street main was also cleaned.

The Agricola Street pipe had a heavy coating at West Street, but only a thin scale about  $\frac{1}{8}$  inch thick at Bilby Street on the bottom of the pipe and scattered blisters on the sides and top. On July 15th the scraper was started at eleven o'clock a. m., with 43 pounds pressure at West Street. It ran to William Street all right, more slowly to Charles Street, then by short jumps. All branches were then shut off, raising the pressure to 57 pounds. The scraper passed North Street at 11.40, but stuck fast in the May Street branch when it reached that point. When taken out it was choked with the oxidation and stones 4 to 6 inches in diameter. The pipe was very tough, a man with a sledge hammer finding some difficulty in breaking the faucet off. The coating of the pipe was clean and bright on both sides and the iron uninjured.

On the night of July 20th the scraper was again inserted at West Street and ran past the May Street branch about 40 feet, but could not be forced further. The pipe was cut ahead of the scraper and found to be choke full. The formation was about  $\frac{1}{2}$  inch thick (when dry) on the sides and  $\frac{1}{4}$  or  $\frac{3}{8}$  inch on the top. On the bottom there were no hard blisters or scale but a deposit of soft material something like marsh mud, easily removed with a tool and not likely to clog the scraper with the usual quantity of water going through. There was not enough getting through, however, to keep the pipe clear ahead, although the pistons (iron) were only  $10\frac{3}{4}$  inches in diameter. Half a brick and some stones were removed with the scraper. About 7 p. m., on the 21st, the scraper having been replaced, full pressure was turned on but it refused to move. An effort was made to start it by a shock with the end of a plank, but under the high pressure the pipe split. The scraper was withdrawn, the front (leather) valve removed, re-inserted at the break and the pipe repaired. It started about one o'clock p. m., July 22nd, under full pressure and ran to Bloomfield Street valve where



it caught. On being freed it ran about 100 feet when it stopped again and had to be cut out. The coating at this point was about 5-8 inches thick, and the toughest encountered in 24 years' experience. The iron was in good condition. The other leather valve was removed and under full pressure the scraper was forced to Bilby Street on the evening of July 25th.

The cleaning of this main has made considerable improvement in the service.

#### PRECIPITATION.

The total rain fall for the year 1904 was about the average. Rain fell on 120 days, snow on 58 days, rain and snow on 18 days.

The first sleighs appeared on the streets on the evening of December 13th and wheels were not again in service for over three months. The snow fall during the winter was the heaviest on record.

Long Lake overflowed in January, February, March, April, May and June. The surface of the lake on September 24th was 5 feet 10 inches below the waste weir. Spruce Hill Lake reached its highest level for the year, 364.46, on April 20th. On October 10th it was 3 feet below waste weir level.

#### AT THE LAKES.

No work of importance was carried on. The location and construction of the Halifax and South Western Railway along the water shed of Chain Lakes, close to those reservoirs, makes it necessary to adopt the strictest precautionary measures for preserving the purity of the source from which three-fourths of our water is obtained. With the opening of the line for traffic the City Engineer requested the Superintendent of the Railway to make a regulation providing that all lavatories and closets shall be kept locked within ten miles of Halifax and take steps to carry it out strictly.

#### ON SERVICE.

The most noteworthy incident was in connection with ordinary repairs. A leak was reported on Pleasant Street at Smith Street, April 18th, 1904. When the pipe was uncovered it was located in a three-way branch. The main pipe is 12-inch and a 9-inch branch had been put in, but had not been used. The 9-inch faucet had

been closed with a 10-inch pine plug. The inner end, which was originally cut square, had been worn and furrowed so that the length of the plug was reduced about three-quarters of an inch. There was a deep cleft from end to end extending from the centre outwards about three-quarters of an inch wide at the inner face and a hole had been worn right through the centre of the plug about one-half inch in diameter. The pressure at the branch was forty pounds and the wood had been in the pipe for about forty years.

#### HIGH SERVICE SUPPLY.

The condition of the high service system has been so fully reported that little can be added. The Committee appointed in 1903-04 to confer with the City Engineer, reported at the Council meeting, held on June 23rd, 1904, recommending that steps be taken to hold as much water as possible in the lakes; that drastic measures be taken to check the waste, and that the best hydraulic engineer available be employed to act in conjunction with the City Engineer in reporting on the whole question.

At the Council meeting on February 14th, Mr. Willis Chipman was employed as Consulting Engineer. Owing to the extraordinary weather conditions, he was unable to commence his work until the last week in April.

In this connection a table is appended, showing the quantity of water wasted by streams of different sizes. Reference to the table shows that a stream through an aperture one thirty-second of an inch in diameter wastes under 8 4-5 pounds pressure, 122 gallons in 24 hours, or more than enough for an ordinary family. In the same time and under the same pressure, a one-half inch tap wastes 31,507 gallons, which is sufficient to supply an ordinary household for one year. Taking five as the average family, each one-half inch tap under 26 pounds pressure can waste enough water to supply about three thousand persons for general household purposes.

#### SEWERS.

Only three sewers were constructed during the year. The Gottingen Street sewer was the most expensive, being constructed in winter and under the car tracks.

The length of sewers constructed under the Act from 1890 to 1904, inclusive, is 113,134 feet or 21½ miles.

Cost .....	\$508,849 14
Amount assessed on property owners.....	233,449 17
	275,399 97
Balance paid by City .....	<u>\$275,399 97</u>

Seventeen concrete catchpits were constructed, making a total of 761. Ten temporary stone pits were built.

An additional appropriation of \$150,000 was authorized by the Legislature during the last session and several much-needed sewers will be provided during the coming year.

The growth of the city on the western slope of the peninsula is slow, but as that portion is built up a sewer system must be provided. Already property owners on Quinpool Road, west of the summit, have asked for a sewer, and before a single sewer is constructed complete surveys should be made and a design adopted covering the whole area to be drained. The discharge of sewage into the North-West Arm at the foot of each street would be most objectionable, and if the work of construction had become an absolute necessity in the past it is probable that favorable consideration would have been given to a scheme for a separate system providing for the discharge of storm water at the foot of each street and an intercepting sewer to carry the house drainage down to the harbor. The septic tank now offers an alternative system, and no study of this problem would be exhaustive which did not include an investigation into the advisability of adopting this modern method of sewage disposal.

#### HOUSE DRAINS AND PLUMBING.

One hundred and eleven permits were issued for laying, cleaning or repairing drains. In consequence of the lack of assistance in the office we have been unable to make maps, plans and records of sewers and drains, and the City will pay far more in the future for full and accurate information which should be on file now but for the questionable policy adopted. The small staff can overtake the routine work, but cannot keep up the growing general work of the City Engineer's office and complete records, plans and details, so necessary for intelligent and correct engineering management in the future.

It is discouraging indeed to be given no opportunity of placing the office in a better condition than it has been in the past. There

should be complete plans and profiles of all sewers and full and accurate records of the exact location of every drain. Such descriptive notes should be on file, that either the City authorities or any property owner at any time could obtain at once the fullest information. These are not unreasonable requests, but are in accord with the policy followed in every city which is administered on sound business methods. Furnishing information to the public relating to sewers and drains is no small part of the work of the office.

In this connection the advisability of having all drains laid by the City should be considered. Street opening under permit is objectionable at best. If the drains were put in to the street line when the sewer is constructed, and the cost returned with the assessment, it would not be necessary to open the streets so often, and the result must be beneficial to the street and the public generally.

The Plumbing Inspector reports approval of 280 applications for permission to do plumbing work and 269 certificates recommended for work properly performed.

The Board of Plumbing Examiners held seven meetings. Six journeymen received certificates and one was refused.

#### INTERNAL HEALTH.

The old sprinklers on four carts were replaced by Studebaker sprinklers and one wooden tank two-horse cart was made in the shops to reduce the mileage of streets watered by each team in the suburbs. The distance to be covered for several years has been too great for any team walking at an ordinary gait.

This service has been severely criticized from time to time, but efficiency under the existing conditions is impossible. At the same time there is room for improvement, and the men engaged in the work can make the service more satisfactory by carrying out strictly the instructions they receive.

First-class service cannot be obtained for the small sum assessed for this purpose. The total appropriation for—

Internal health is ..... \$14,000 00

In 1904-5 this amount was expended as follows:—

Cleaning streets, labor and cartage.....	\$5,729	74	
"    catch-basins, labor and cartage.....	2,008	55	
Removal of ashes and garbage, labor.....	1,872	90	
Street sprinkling.....	1,022	92	
Renewals and repairs, etc.....	594	14	
Repayment for work done before May 1st, 1904	2,771	75	
			\$14,000 00

Surely any fair-minded citizen must admit that not only is the amount at the disposal of the Department entirely inadequate for the work demanded, but the City employees give all that can be reasonably expected for the money. Where is the citizen who will undertake to keep our one hundred miles of streets clean for one year for \$57.29 per mile? And yet they expect the City officials to do it.

Even when cleaned frequently macadam roadways are dusty in the dry season and muddy in the wet. Our roads which are not cleaned frequently (to say the least) always have upon their surface a quantity of dust from the vehicle traffic and wear of the road material. With the number of teams available it is impossible to sprinkle each street more than twice a day, so that a street sprinkled at half-past seven o'clock a. m. is not sprinkled again until half-past one. Some streets are not reached until eleven-thirty and five-thirty. Such streets must of necessity have the dust blowing from early morning until the cart can reach them and from noon until late in the afternoon. In bright sunshine a strong breeze will dry our macadam roadways in half an hour, so that the dust must blow all day except during one hour (half an hour in the morning and half an hour in the afternoon) until we are prepared to spend money enough to sprinkle and clean the streets properly. It cannot be prevented by the favorite method of superficial observers, viz., abusing city officials. A man of moderate means does not get the luxuries enjoyed by the wealthy, and other cities enjoying the luxuries which excite the envy of Haligonians pay more than we seem to be able to afford.

Three sprinklers were operated by contract, one by Wm. Parsons at \$3.70 per day, one by George Harvey at \$3.90, and one by Robinson Bros. at \$3.95.

Willoughby Smith tendered to supply teams for street and catch-pit cleaning at 19 cents per hour, but the Council decided to hire

teams by the day. The work cost about \$600.00 more than it could be done for by contract, and the additional dirt that could have been removed for that amount was left on the streets.

The removal of ashes and garbage is costing more every year, as the quantity to be removed increases. The increase in cost in the last two years, however, is due principally to increases in wages paid to drivers and laborers. In 1904-5 the cost was—

Labor and extra teams .....	\$1772 61
City teams .....	3982 60
Total.....	<u>\$5755 21</u>

A great improvement could be made in this service if ashes and garbage could be taken from inside the premises by the City men so that the sidewalks would not be decorated for a day or a night with rows of barrels, cans, boxes, etc., filled with garbage and refuse of every description, offensive not only to the sight, but also to the nostrils, and littering the street with paper, straw, excelsior and flying dirt. The extra work could not be overtaken by the existing force, and a larger appropriation would be necessary.

There are other obstacles in the way, however. The work could not be performed at night, as many householders would refuse to leave their gate unfastened. In the business district, where there are no gates, stores are closed when the carts arrive at night. Removal of garbage during the day is decidedly objectionable in summer unless it can be done more frequently than we can afford. Some improvement might be made in appearance, at least, if receptacles for ashes and garbage were placed on the street for removal as close to the building line as possible, instead of at the curb. This could be carried out on residential streets only where steps project beyond the building line. On business streets receptacles placed near the building line would be in the way of pedestrians.

The disposal of garbage is not a live question at present, but some provision must be made without delay for the disposal of night soil. This problem must be solved during the coming year. The question is under consideration, but is not yet ready for discussion.

#### STREETS.

The owners of property on the west side of Water Street,

between Duke Street and George Street, with one exception, refused the offer of the Council, and the land required for widening was expropriated. Mr. Geo. Wiswell was appointed arbitrator by the City and Mr. Wm. Nisbet by the Governor-in-Council. The Board confirmed the appraisalment of three properties, rectified a mistake on a fourth and increased the fifth \$200.00.

The Council decided to widen Agricola Street on the east side between Cunard Street and West Street, and the appropriation (\$27,000.00) had been provided and preliminary steps taken before the end of the year.

The Halifax Land Co. offered a deed of Livingstone Street through Merklesfield from Gottingen Street to Longard Road, but the acceptance was postponed until the City can afford to grade it or until the grading has been done by the property owners.

The north end of Lorne Terrace was claimed as private property and offered to the City for \$40.00. His Honor the Recorder reported at the meeting of Council on October 6th, 1904, that it had become public property, and on his recommendation a resolution was passed declaring it a public street.

The merchants doing business on Granville Street, between George Street and Water Street, petitioned for a permanent pavement and offered to pay 75 cents per foot frontage.

The Council decided to grant their request, and after an inspection of the Bitulithic at Glace Bay by members of the Council the recommendation of the representatives of the merchants was approved and a contract made subsequently with the Warren Bituminous Paving Company of Ontario. The Halifax Electric Tramway Company were notified by resolution at the meeting at which Bitulithic was approved (August 25th, 1904), to pave their track allowance with the same material.

The extraordinary snow-fall and the entire absence of thaws resulted in a great accumulation of snow on Water Street, and towards the last of March the streets became almost impassable for heavy traffic, as wheels had superseded runners and ruts and holes were growing deeper daily. The extent of the work required to clear the street was too great for the amount of money left in our small street appropriation after such a hard winter. Realizing the absolute necessity of solving the problem without further delay, a

public meeting was called on March 9th, 1905, which was attended by all interested. The Council were requested to borrow \$5,000, and many Water Street merchants and truckmen volunteered to supply horses and men. The Council approved during the afternoon of the same day, and a large force working night and day under the supervision of the Works Department, and with the assistance of its employees, soon removed the snow and ice and restored the street to its summer condition. Sixty-seven teams and forty-six men were supplied voluntarily, the teams working a total of 970 hours and the men 733 hours.

The movement started by the Granville Street Association is in the direction followed by all municipal improvement bodies, viz, for cleaner streets and better wearing surfaces. We cannot have clean streets and freedom from dust without a more permanent wearing surface than macadam,

The remarks respecting the appropriation for street sprinkling apply with equal force to all street work. Citizens asking the Department to make repairs late in the season frequently get the reply "our money is exhausted." They argue that it will require very little to do what they ask, but when all the "very littles" are added together they make a very large sum, and much necessary work cannot be done. The Works Department officials know well that more work should be done than they are able to do, but they also know that all the work that should be done would cost far more than the amount taxed for street purposes. The appropriation is expended as far as it will go, but the rest of the work, no matter how urgent, must stand over for another year. The whole appropriation can be spent in patching alone without completing that necessary work. Where, then, is the money to come from to satisfy the demand for curbs, sidewalks, gutters, crossings, etc.? People say what do we pay taxes for; but one dollar of taxes will not pay for two dollars' worth of work. To make matters worse, the increase of wages further reduces the quantity of work that can be done for the amount taxed, consequently even less work must be done this year than last year. Individually, many citizens pay taxes enough, collectively they do not pay enough to keep up the public services properly. The City Works Department can satisfy all demands for work if they are given the money, but are as powerless without it as anybody else would be in the same position.



It is generally admitted that there is much room for improvement in the condition of our streets and sidewalks. Two features which tend to make the streets unsightly are the rain conductors and the cobble gutters. Both these nuisances have been condemned time and again, and some energetic move should be made to abolish them forever. Through the efforts of the Board of Health the regulations now provide that where new plumbing is constructed the rain conductors shall be connected with the drain. This, however, does not reach many existing obstructions.

The cobble gutters make the roadway narrower, as teams cannot drive on them. They are not neat in appearance, catch all dirt, are not cleaned by rains, grass grows in them and all dirt must be picked out first before it can be removed with a broom. The cleaning costs eight times as much as the cleaning of granite or concrete. The first cost of a cobble gutter is less than that of granite or concrete, but in the end it is more expensive. It would be cheaper then to construct a short length of this kind of work each year and do it with granite, or in the suburbs of concrete. The Council should prohibit the laying of any more cobble gutters.

The sidewalk laid on South Park Street last year had a grass plot on the outside, purposely laid narrow. In front of many properties it is still in good condition, but in front of others ash barrels have been rolled over it, the chimes cutting up the sod, coal teams have been allowed to destroy it, and children have been permitted to tear it to pieces, until portions of it have disappeared and its original neatness is a thing of the past. How is it possible to keep up a respectable show when citizens will not take some pride in their own front door?

In almost all cities each person is responsible for his own sidewalk, which must be kept clean and the grass clipped and trimmed. We sadly need a campaign of education and the cultivation of civic pride.

Nearly all the sidewalk work for some time has been of tar concrete (asphalt and tar) construction. Our experience with this material does not justify its use in future. Its life is too short and cost of repairs too heavy. It should be abandoned for more permanent work. Cement concrete costs more to lay, but lasts so much longer that it would be better and cheaper in the end to lay a smaller quantity each year with a more permanent material than tar concrete.

## PUBLIC BATHS.

The Beach Bath was opened June 25th and closed September 17th. The number of bathers was:—Males, 4209; females, 1330; total, 5539. The expenditure was \$620.75; receipts, \$295.10.

The Floating Bath was opened June 29th and closed August 27th. The attendance was 3427 males, 422 females; total, 3849. Expenditure, \$430.78; receipts, \$24.25.

## STREET RAILWAY.

Double track was laid on Granville Street, between Buckingham St. and George St., the only new construction during the year.

## BUILDING ACT.

The new Act was put in operation, the City Carpenter assisting in the practical work of building inspection.

Two hundred and eighty-six permits were issued, 67 being for new buildings and 219 for repairs, alterations, renewals, additions, &c.

Eight violations of the law were reported to His Honor the Recorder for action.

Date of report.	OWNER.	LOCATION.	VIOLATION.
1904.			
June 30.	Mrs. Louisa Bailey	131-3 Gottingen St....	Erecting stable without permit from Health Board or Inspector.
Aug. 22.	J. O'Dwyer .....	199-201 L. Water St..	Erecting addition of wood in building district without permit.
Oct. 21.	E. M. Boutillier..	Glace Bay Wharf.....	Erecting smoke house without special permit under section 571 or building permit.
Dec. 27.	Dillon Bros.....	33 Albemarle St ....	Erecting wooden carriage house in building district without permit
1905.			
Feb. 17.	Geo. C. Cook.....	47 Upper Water St...	Erecting wooden wall in building district & reconstructing building without permit.
Feb. 22.	Wm. King.....	Rear E. side Hollis St.	Converting wooden stable into dwelling in building district without permit.
Mch. 10.	J. O'Dwyer.....	220 Lower Water St..	Converting wooden stable into hotel in building district without permit.
Apl. 24.	F. A. Verge.....	125-7 Cunard St.....	Constructing bay window encroaching on street without permit.

## CABLE CONDUITS.

The statement appended shows the underground work performed during the year.

The report of the Clerk of Works shows the total

## GENERAL EXPENDITURE.

Baths .....	\$ 1,015 28
Teams and Stables .....	4,976 20
Insurance .....	1,097 25
Telephones.....	243 50
Street Lighting.....	19,669 55
City Hall Lighting.....	750 00
Citadel Improvement.....	26 09
Fuel.....	1,167 45
Internal Health.....	14,013 64
Sewers .....	11,018 78
City Property. ....	2,213 02
Streets .....	33,763 40
Water Construction.....	8,916 27
Water Maintenance.....	84,597 32
	\$183,467 75
Total labor pay roll.....	61,622 12

The reports of Foremen, Inspectors, etc., and statements of expenditure, etc., are appended.

Respectfully submitted.

F. W. W. DOANE,  
*City Engineer.*

## TABLE SHOWING NUMBER OF GALLONS OF WATER DISCHARGED

Through Different Sized Apertures, and with Different Heads of Water, in a Minute, and in Twenty-four Hours.

Diameter of Aperture in inches.		$\frac{1}{32}$		$\frac{1}{16}$		$\frac{1}{8}$		$\frac{3}{16}$		$\frac{1}{4}$		$\frac{3}{8}$		$\frac{1}{2}$		$\frac{5}{8}$		$\frac{3}{4}$		$\frac{7}{8}$	
Head of water in feet.	Pounds pressure per sq. inch.	Gallons Discharged.		Gallons Discharged.		Gallons Discharged.		Gallons Discharged.		Gallons Discharged.		Gallons Discharged.		Gallons Discharged.		Gallons Discharged.		Gallons Discharged.		Gallons Discharged.	
		Per Min.	Per 24 Hours.	Per Min.	Per 24 Hours.	Per Min.	Per 24 Hours.	Per Min.	Per 24 Hours.	Per Min.	Per 24 Hours.	Per Min.	Per 24 Hours.	Per Min.	Per 24 Hours.	Per Min.	Per 24 Hours.	Per Min.	Per 24 Hours.	Per Min.	Per 24 Hours.
20	8.8	.085	122.4	.34	480.6	1.36	1,958.4	3.07	4,420	5.47	7,877	12.31	17,726	21.83	31,507	44.1	49,104	49.2	70,818	67.0	96,480
40	17.6	.12	172.8	.48	691.2	1.93	2,370.2	4.35	6,264	7.73	11,131	17.40	25,056	30.04	44,553	48.3	69,552	69.6	100,224	94.7	136,368
60	26.4	.148	213.1	.59	840.6	2.36	3,398.4	5.32	7,660	9.47	13,636	21.31	31,086	37.89	54,561	59.2	85,248	87.25	125,640	116.	167,040
80	35.2	.17	244.8	.68	979.2	2.73	3,931.2	6.15	8,856	10.94	15,753	24.62	35,452	43.76	63,014	68.3	98,352	98.4	141,696	134.	192,960
100	44.	.191	275.	.76	1,094.4	3.05	4,392	6.88	9,907	12.24	17,425	27.54	39,657	48.95	70,488	76.4	110,016	110.1	158,544	149.9	215,856
120	52.8	.21	302.4	.83	1,195.2	3.35	4,824	7.53	10,843	13.04	19,296	30.15	43,416	53.6	77,184	83.7	120,528	120.6	173,664	164.1	236,304
140	61.6	.227	326.8	.905	1,303.2	3.61	5,198.4	8.14	11,721	14.48	20,851	32.58	46,715	57.91	83,390	90.40	130,305	130.3	187,632	177.3	255,312
160	70.4	.242	348.4	.907	1,392.4	3.86	5,558.4	8.8	12,672	15.47	22,276	34.81	50,126	61.88	89,107	96.69	139,233	139.2	200,448	189.5	272,980
180	79.2	.257	370.	1.02	1,468.8	4.1	5,904	9.23	13,291	16.38	23,587	36.93	53,179	65.65	94,536	102.68	147,715	147.7	212,688	201.	289,440
200	88.	.271	390.2	1.08	1,556.2	4.32	6,220.8	9.73	14,011	17.30	24,912	38.94	66,073	69.23	99,591	108.17	155,764	155.7	224,208	212.	305,280

TABLE SHOWING NUMBER OF GALLONS OF WATER DISCHARGED, ETC — (Continued.)

Diameter of Aperture in inches.		1		1 $\frac{1}{8}$		1 $\frac{1}{4}$		1 $\frac{3}{8}$		1 $\frac{1}{2}$		1 $\frac{3}{4}$		2		2 $\frac{1}{4}$		2 $\frac{1}{2}$	
Head of water in feet.	Pounds pressure per sq. inch.	Gallons Discharged.		Gallons Discharged.		Gallons Discharged.		Gallons Discharged.		Gallons Discharged.		Gallons Discharged.		Gallons Discharged.		Gallons Discharged.		Gallons Discharged.	
		Per Min.	Per 24 Hours.	Per Min.	Per 24 Hours.	Per Min.	Per 24 Hours.	Per Min.	Per 24 Hours.	Per Min.	Per 24 Hours.	Per Min.	Per 24 Hours.	Per Min.	Per 24 Hours.	Per Min.	Per 24 Hours.	Per Min.	Per 24 Hours.
20	8.8	87.5	126,000	110.7	159,408	136.7	190,848	165.4	238,176	196.9	283,536	268.	385,920	350.1	504,144	433.1	638,064	547.1	787,824
40	17.6	123.7	178,128	156.6	225,504	193.3	276,352	233.9	336,816	278.4	400,896	370.	515,760	495.	712,800	626.5	902,160	773.5	1,113,840
60	26.4	161.5	218,160	191.8	266,192	236.8	340,092	286.5	412,560	341.5	491,760	464.	668,160	606.2	872,928	767.3	1,104,912	947.3	1,364,112
80	35.2	175.	252,000	221.5	318,960	273.5	393,840	330.9	476,496	393.9	567,216	536.1	771,684	700.2	1,008,288	886.2	1,276,128	1094.1	1,575,604
100	44.8	195.8	281,952	247.8	356,832	305.8	440,352	370.2	533,088	440.6	634,464	599.7	863,568	783.3	1,127,952	991.4	1,427,616	1223.9	1,762,416
120	52.8	214.4	308,736	271.3	390,672	335.	482,400	405.3	583,632	482.4	694,656	656.6	945,504	857.7	1,235,088	1085.5	1,568,120	1340.2	1,920,888
140	61.6	231.6	333,504	293.2	422,208	361.9	521,136	437.9	630,576	521.2	750,528	709.4	1,021,536	926.6	1,334,448	1172.8	1,688,832	1447.9	2,084,976
160	70.4	247.5	356,400	313.2	451,008	386.7	556,848	467.9	673,776	556.9	801,936	758.	1,091,520	990.1	1,425,744	1253.1	1,804,464	1647.	2,227,680
180	79.2	262.6	378,144	332.3	478,512	410.3	590,832	496.4	714,816	590.8	850,752	804.2	1,158,078	1050.4	1,512,576	1320.4	1,914,336	1641.3	2,363,472
200	88.	276.9	398,736	350.4	504,576	432.6	622,944	523.5	753,840	623.	897,120	848.	1,221,120	1107.6	1,594,944	1401.9	2,018,736	1730.7	2,492,206

TABLE SHOWING NUMBER OF GALLONS OF WATER DISCHARGED, ETC.—(Continued.)

Diameter of Aperture in inches.		2½		3		3½		4		4½		5		5½		6	
Head of water in feet.	Pounds pressure per sq. inch.	Gallons Discharged.		Gallons Discharged.		Gallons Discharged.		Gallons Discharged.		Gallons Discharged.		Gallons Discharged.		Gallons Discharged.		Gallons Discharged.	
		Per Min.	Per 24 Hours.	Per Min.	Per 24 Hours.	Per Min.	Per 24 Hours.	Per Min.	Per 24 Hours.	Per Min.	Per 24 Hours.	Per Min.	Per 24 Hours.	Per Min.	Per 24 Hours.	Per Min.	Per 24 Hours.
20	8.8	665	957,600	787	1,134,144	1,072	1,543,680	1,400	2,016,576	1,172	2,551,680	2,188	3,151,200	2,660	3,830,400	3,148	4,533,120
40	17.6	944	1,359,360	1,113	1,603,584	1,516	2,183,040	1,980	2,851,200	2,506	3,608,640	3,094	4,455,360	3,776	5,437,440	4,452	6,410,880
60	26.4	1,151	1,657,440	1,366	1,967,040	1,856	2,672,640	2,424	3,491,712	3,068	4,419,848	3,780	5,456,448	4,604	6,629,760	5,464	7,868,160
80	35.2	1,329	1,913,760	1,575	2,268,864	2,144	3,087,736	2,801	4,032,152	3,544	5,105,512	4,376	6,302,016	5,316	7,655,040	6,300	9,112,000
100	44.8	1,478	2,128,320	1,762	2,537,956	2,398	3,454,272	3,133	4,511,808	3,964	5,710,464	4,895	7,049,664	5,912	8,513,280	7,048	10,149,120
120	52.8	1,628	2,344,820	1,920	2,778,624	2,626	3,782,016	3,480	4,940,352	4,342	6,252,480	5,361	7,719,552	6,512	9,377,280	7,716	11,111,040
140	61.6	1,760	2,534,400	2,084	3,002,112	2,837	4,086,144	3,706	5,337,792	4,691	6,755,328	5,791	8,339,904	7,040	10,137,600	8,386	12,008,840
160	70.4	1,880	2,707,200	2,227	3,207,744	3,032	4,366,080	3,960	5,702,976	5,012	7,217,856	6,188	8,910,720	7,520	10,828,800	8,908	12,827,520
180	79.2	1,994	2,871,360	2,363	3,403,008	3,216	4,632,312	4,200	6,050,304	5,316	7,657,344	6,565	9,453,888	7,976	11,485,440	9,452	13,610,880
200	88.	2,102	3,026,580	2,492	3,588,480	3,392	4,884,480	4,430	6,379,776	5,607	8,074,944	6,922	9,968,832	8,408	12,107,520	9,968	14,353,920
225	97.4	2,229	3,209,760	2,673	3,849,120	3,612	5,201,280	4,717	6,792,480	5,968	8,593,920	7,368	10,600,920	8,916	12,830,040	10,695	15,396,480
250	108.2	2,346	3,378,240	2,792	4,220,480	3,800	5,472,000	4,964	7,148,160	6,280	9,043,200	7,763	11,164,320	9,384	13,512,960	11,168	16,081,920

NEW UNDERGROUND WORK LAID IN HALIFAX BY THE  
NOVA SCOTIA TELEPHONE CO., LTD.,  
1904.

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MAINS.

From manhole at the corner of Spring Garden Road and Pleasant Streets, 6 ducts south, 486 feet to manhole at Bishop Street.

Thence 6 ducts 475 feet to manhole at Morris Street.

Thence 4 ducts 373 feet to manhole at Harvey Street.

Thence 4 ducts 289 feet to manhole at South Street.

Thence 4 ducts 197 feet to manhole at Tobin Street.

Thence 4 ducts 340 feet to manhole at Kent Street.

From manhole at the corner of Hollis and Sackville Streets, 4 ducts 371 feet north to manhole at Prince Street.

BRANCHES.

From manhole at Morris Street, 1 duct 22.6 feet to pole in south-west corner of Morris and Pleasant Streets.

From manhole at Morris Street, 1 duct 88 feet to pole in south-east corner of Pleasant and Morris Streets.

From manhole at Harvey Street, 1 duct 47 feet to pole in south-west corner of Harvey and Pleasant Streets.

From manhole at South Street, 1 duct 61 feet to pole north-west corner of South and Pleasant Streets.

From manhole at South Street, 1 duct 50 feet to pole in south-east corner of Pleasant and South Streets.

From manhole at Tobin Street, 1 duct 43 feet to pole in north-west corner of Tobin and Pleasant Streets.

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From manhole at Kent Street, 1 duct 55 feet to pole in north-west corner of Kent and Pleasant Streets.

From manhole at Kent Street, 3 ducts 110 feet to pole in south-east corner of Pleasant and Victoria Lane.

From manhole at Hollis and Prince Streets, 1 duct 168 feet to pole north of Prince.

From manhole at Hollis and Prince Streets, 1 duct 63 feet to pole south-west corner of Hollis and Prince.

From manhole corner of Granville and Duke, 2 ducts 213 feet to pole south-west corner of Hollis and Duke.

From manhole corner Barrington and Buckingham, 1 duct 49.6 feet to pole south-east corner Barrington and Buckingham.

5659 feet of cable was pulled in, containing 361 miles of wire.



**REPORT FOREMAN WATER DEPARTMENT.**

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CITY HALL, April 30th, 1905.

F. W. W. DOANE, ESQ.,  
*City Engineer,*

SIR,—The following is the Annual Report of stock belonging to the Water Department, length of main and service pipes laid, length of pipes cleaned and re-cleaned, and location of houses supplied with water during 1904.

All of which is herewith respectfully submitted.

E. MORRISON,  
*Foreman Water Department.*

## New Mains.

STREET.				CAST IRON MAIN PIPE.				HYDN'TS.		COST PER FOOT IN CENTS.						Total Cost.					
IN	FROM	TO		High or Low Service.	4 inch pipe—feet.	6 inch pipe—feet.	Joints.	Number of Valves.	Length of pipe—feet.	Size of pipe—inches.	Number.	Number of Valves.	Percentage of Rock.	Pipes and Specials.	Valves and Hydrants.		Labor and Cartage.	Lead, Gasket, &c.	Dynamite and Fuse.	Incidentals.	Total.
Cedar .....	Louisburg .....	Henry .....	H	245		T. & B.	1						62.3	8.1	77.9		1.3			} 147.9	\$455 62
Henry .....	Cedar .....	63 ft. south .....	H	63		"							60.0		77.9		3.0				
King's Place .....	End of pipe .....	81 ft. north .....	H	81		"							60.0		92.1	0.9	1.7			} 167.5	257 98
South Bland .....	" .....	154 ft. north .....	L	154		"							60.0		103.7	0.6	3.2				
Young .....	End of pipe W. of Windsor .....	609 ft. west .....	H	609		"	1	9	6	1			60.1	14.0	58.2	0.8	1.0				

## OLD MAINS REPLACED WITH LARGER MAINS.

Bauer .....	Falkland .....	Cogswell .....	H	273		"	1						43.2	5.9	35.5	1.4				} 86.0	234 87
Brenton .....	Spring Garden Rd. .....	Morris .....	L	943		"	2						41.6	3.4	46.6	0.7					
Brenton Place .....	Brenton .....	Hydrant .....	L	24		"							53.3		61.4	11.6				} 126.3	30 34
Carlton .....	Spring Garden Rd. .....	College .....	H	350		"	2						61.2	10.5	51.5	1.4					
Cunard .....	Chestnut Place .....	Moran .....	H	489		"	1						61.5	17.2	61.5	0.8	0.2			} 106.4	879 04
" .....	Moran .....	Park .....	H	380		"	1	7	6	1			42.3	4.8	49.0	1.8					
Dresden Row .....	Rottenburg .....	Morris .....	L	478		"	2						40.9	6.7	50.1	0.9				} 98.2	464 92
Maynard .....	Cunard .....	Cornwallis .....	H	500		"	2						41.0	6.4	49.7	1.0					
Moran .....	" .....	Sarah .....	H	425		"	2						43.0	7.5	34.2	0.9				} 103.4	315 33
Sarah .....	Agricola .....	Love Lane .....	H	305		"	2						42.5	9.2	50.9	0.8					
Spring Garden Rd. .....	Summer .....	Carlton .....	H	485		"	1	9	6	1	1		66.5	21.5		3.0	0.3			} 40.0	5.9
" .....	" .....	Tower Road .....	H & L	813		"	3						40.0	5.9	41.0	0.3					
" .....	Carlton .....	Robie .....	H	445		"	2						40.0	7.2		0.2				} 88.7	789 04
Tower Road .....	Ingليس .....	End of 6 inch N. of Victoria Road .....	L	926		"	3						41.9	5.2	40.9	0.7					

All old pipe taken up was 3 inch.

### Total length in feet of Cast Iron Water Mains in the Water Supply System.

	SIZE OF PIPE IN INCHES.											Total.
	27	24	20	15	12	9	8	6	4	3	Less than 3 in.	
Length December 31st, 1903. ....	14560	20524	6712	44236	37201	43127	415	133765	27810	37469	898	366717
Laid during 1904. ....	.....	.....	.....	.....	.....	.....	.....	2531	5462	.....	.....	7993
	14560	20524	6712	44236	37201	43127	415	136296	33272	*30653	898	*367894

Equal to  $69 \frac{3}{5} \frac{5}{2} \frac{7}{8} \frac{1}{0}$  miles.

\*6816 feet of 3 inch pipe replaced by 4 inch and 6 inch.

N. B.—45 feet of 20 inch pipe in waste way Chain Lakes, and pipes from mains to hydrants (except wharves) laid previous to 1897, not included in above summary.

## Pipe Cleaning by Mechanical Scrapers.

DATE.	LOCATION.	Diameter in inches.	Length cleaned in feet.	COST.	REMARKS.
June 1st.	High Service Main.....	20	6712	\$15 80	Re-cleaned.
"	" ".....	15	29628		
June 27th.	Robie from Willow Tree to West Street.....	12	1595	741 30	Cleaned.
"	West St. from Robie to Agricola Street.....	12	925		
July 11th.	Agricola from West to Bilby St.	12	2952		"
Sept. 1st.	High Service.....	20	6712	15 54	Re-cleaned.
"	".....	15	29628		
Nov. 15th.	".....	20	6712	24 21	"
"	".....	15	29628		
Nov. 16th.	Low Service Main.....	24	13400	16 34	"

## New Service Pipes.

$\frac{1}{2}$ Inch. Feet.	$\frac{3}{4}$ Inch. Feet.	1 Inch. Feet.	2 Inch. Feet.	3 Inch. Feet.	Total length Feet.
2373	41	18.6	.....	.....	2432.6

## House Services Renewed.

$\frac{1}{2}$ inch. Feet.	1 inch. Feet.	Total length Feet.
1677	53	1730

## New Hydrants.

STREET.	LOCATION.	Kind.	Service.	Size of Pipe in Inches.	Length of Pipe in Feet.	No. of Nozzles.	Distance Valve from Hydrant.
							FT. IN.
Cunard .....	Cor. Moran .....	City..	H.	6	7	3	.. .
Sp. Garden Rd.	Cor. Carlton.....	" ..	"	6	9	3	5 .. 0
West Young .	Cor. King .....	" ..	"	6	9	3	.. .

## Old Hydrants Replaced with Frost Jacket Hydrants.

STREET.	LOCATION.	Kind.	Service.	Size of Pipe in Inches.	Length of Pipe in Feet.	No. of Nozzles.	Distance Valve from Hydrant.
							FT. IN.
Cunard .....	Opp. North Park.....	City..	H.	6	...	3	3 .. 7
Bilby .....	Cor. Agricola .....	" ..	"	6	...	3	.. .
Sackville .....	Cor. Albemarle.....	" ..	L.	6	...	3	3 .. 10
*Willow .....	Cor. Robie.....	" ..	"	...	...	3	3 .. 4

\*Hydrant moved.

## Summary of Hydrants.

No. of Hydrants on	Streets	December 31st, 1903	368
"	"	Wharves	20
"	"	Military and Naval property, Dec. 31st, 1893..	20
"	"	Private property	13
"	"	in use December 31st, 1903	421
"	"	set on streets in 1904	3
"	"	in use December 31st, 1904	424

## New Valves.

ON MAINS.

STREET.	LOCATION.	Size.	Service.
		Inch.	
Bauer .....	N. side Cogswell, N. E. cor. house, 23' 8", S. of line Cogswell 14' 8" .....	4	High.
Carlton .....	S. side Spring Garden Road, S. E. cor. house, 39' 4", S. of cor. 0' 3" .....	6	"
Cedar .....	E. side Louisburg, S. E. cor. house (not porch), 25' 8"	6	"
Cunard .....	E. side Chestnut Place, N. E. cor. 19' 5", a little E.	6	"
Moran .....	S. side Sarah, S. E. cor. 23' 9" S. of cor. 0' 3" .....	4	"
" .....	N. side Cunard, N. E. cor. 18' 0" .....	4	"
Sarah .....	W. side Agricola, N. W. cor. 15' 6" E. of cor. 1' 0"	4	"
" .....	E. side Love Lane, S. E. cor. 24' 11" N. of cor. 21' 3" .....	3	"
Sp. Garden Rd.	W. side Tower Road, S. W. cor. 35' 1" E. of cor. iron fence 1' 0" .....	4	Low.
" .....	E. side Summer, S. E. cor. 33' 8" .....	4	High.
" .....	W. side Carlton, S. W. cor. house 31' 0" W. of cor. house 2' 0" .....	4	"
Young .....	E. side Dublin, S. E. cor. 21' 0" E. of cor. 1' 6" .....	6	"

## Hydrant Valves.

STREET.	LOCATION.	Size.	Service.
Cunard .....	Opp. N. Park, 3' 7" from hydrant .....	6	High.
Sackville .....	Cor. Albemarle, 3' 10" from hydrant .....	6	Low.
Sp. Garden Rd.	Cor. Carlton, 5' 0" from hydrant .....	6	High.
Willow .....	Cor. Robie, 3' 4" from hydrant .....	6	"

## Old Valves Replaced.

STREET.	LOCATION.	Size inches.		Service
		Old.	New.	
Brenton .....	N. side Morris, N. W. cor. porch 28' 0" .....	3	4	Low.
" .....	S. side Spring Garden Rd., S. E. cor. 19' 9" line street west .....	3	4	"
Carlton .....	N. side College, N. E. cor. 38' 2" .....	3	6	High.
Cunard .....	E. of Agricola, N. side 16' 3' fire hydrant 8' 8" .....	3	4	"
Dresden Row .....	N. side Morris, S. W. cor. 30' 8" .....	3	4	Low.
" .....	S. side Rottenburg, N. E. cor. 43' 9" S. of E. cor. 42' 6" .....	3	4	"
Maynard .....	S. side Cunard, S. E. cor. 21' 10" .....	3	4	High.
" .....	N. side Cornwallis, N. W. cor. 30' 0" N. of cor. house 0' 3" .....	3	4	"
Sp. Garden Rd. ....	S. side opp. Convent, 36' 7" tree W. main gate 35' 1" .....	3	4	H. & L.
" .....	W. side Summer, S. W. cor. fence 32' 0" W. of cor. 1' 0" .....	3	6	High.
" .....	E. side Robie, S. E. cor. 32' 9" .....	3	4	"
Tower Road .....	N. side Inglis, N. E. cor. 24' 0" N. of cor. 0' 6" .....	3	4	Low.
" .....	S. side Victoria Road, S. E. cor. 19' 9" .....	3	4	"
" .....	N. " " N. E. cor. house 30' 8" line S. cor. house .....	3	4	"

## Total Number of Valves.

	27"	24"	20"	15"	12"	9"	6"	4"	3"	1 1/2"	1 1/4"	1"	3/4"	Hydrant Valves 6"	Total.
In use December 31st, 1903 .. . . .	1	8	2	29	55	66	325	87	121	1	9	2	11	71	*788
Set during 1904 .....	...	...	...	...	...	...	6	19	1	...	...	...	...	4	30
	1	8	2	29	55	66	331	106	*108	1	9	2	11	75	*804

\*14 three-inch valves replaced by larger valves.

N. B.—All valves open by turning to the right except 2 on the 24" mains at their junction below Chain Lake gate houses.

## Pipe Stock on Hand December 31st. 1904.

No. pieces.	Diameter in inches.	Weight of one in lbs.	Total weight in lbs.	Value per lbs. inc.	Total Value.	REMARKS.
3	27	2870	8610	1 $\frac{3}{4}$	\$ 150 67	Class A, T. & B. 12 ft.
3	27	3206	9618	1 $\frac{3}{4}$	168 10	Class B, T. & B. 12 ft.
1	27	3658	3658	1 $\frac{3}{4}$	64 01	Class C, T. & B. 12 ft.
6	24	2360	15160	1 $\frac{3}{4}$	202 13	
4	20	1263	5052	2 $\frac{1}{4}$	113 67	
9	15	1200	10800	2 $\frac{1}{4}$	243 00	
12	12	680	8160	2 $\frac{1}{4}$	184 20	
95	9	500	47500	2 $\frac{1}{4}$	1068 75	
13	10	550	7150	2 $\frac{1}{4}$	160 87	
36	8	386	13896	2 $\frac{1}{4}$	312 96	
284	6	380	107920	2 $\frac{1}{4}$	1079 20	
478	6	280	133840	2 $\frac{1}{4}$	3011 40	
34	4	204	6936	2 $\frac{1}{4}$	156 06	12 ft. long.
1	4	156	156	2 $\frac{1}{4}$	3 51	9 ft. long.
89	3	130	11570	2 $\frac{1}{4}$	260 32	9 ft. long.
17	5	222	3774	2 $\frac{1}{4}$	84 91	
118	.....	26	3068	2 $\frac{1}{4}$	69 03	Stand pipe.
83	.....	12	996	2 $\frac{1}{4}$	22 47	Plates.
185	.....	6	1110	2 $\frac{1}{4}$	24 97	Caps.
125	.....	18	2250	2 $\frac{1}{4}$	50 62	Sleeves for service pipe.
248	.....	4	992	2 $\frac{1}{4}$	22 32	Sq. caps for stopcocks.
158	.....	2	316	2 $\frac{1}{4}$	7 10	Thimbles for ser. pipes.
27	.....	7	189	2 $\frac{1}{4}$	4 25	Sq. caps for main stopcocks.
2029			402721		\$7464 52	



## Pipe—Specials.

No. of pieces.	Diameter in inches.	DESCRIPTION.	Weight of one in lbs.	Total weight in lbs.	Value per lb. in cents.	Total value.
12	27	Thimbles.....	624	7488	2 $\frac{1}{2}$	\$ 168 48
2	27	Bell Mouths.....	831	1662	2 $\frac{1}{4}$	37 39
13	27	Bevel Collers.....	795	10335	3	310 05
1	27	Plain Special, 2 ft. long, Class A.....	404	404	1 $\frac{1}{4}$	7 07
1	27	“ “ 2 “ “ B.....	460	460	“	8 05
1	27	“ “ 3 “ “ B.....	700	700	“	12 25
1	27	“ “ 4 “ “ B.....	920	920	“	16 10
1	27	“ “ 5 “ “ B.....	1248	1248	“	21 84
2	27	“ “ 5 “ “ B.....	1144	2288	“	40 04
1	27	“ “ 3 “ “ C.....	820	820	“	14 35
1	27	“ “ 3 “ “ C.....	930	930	“	16 27
1	27	“ “ 4 “ “ C.....	1068	1068	“	18 69
1	27	“ “ 5 “ “ C.....	1332	1332	“	23 31
1	24	Bevel Collar.....	688	688	3	20 64
12	24	Thimbles.....	396	4752	2 $\frac{1}{4}$	106 92
1	24	Cap.....	290	290	“	6 52
6	24	Split Thimbles.....	620	3720	2 $\frac{1}{2}$	93 00
1	24	Y Branch 24" x 24".....	2372	2372	2 $\frac{1}{4}$	53 37
4	20	Thimbles.....	230	920	“	20 70
1	20	Split Thimbles.....	453	453	2 $\frac{1}{4}$	11 32
3	15	4-way branches.....	896	2688	2 $\frac{1}{4}$	60 48
3	15	4-way branches 15" x 6".....	660	1980	“	44 55
1	15	3-way branch.....	812	812	“	18 27
2	15	Y's.....	1112	2224	“	50 04
4	15	Thimbles.....	234	936	“	21 06
1	15	3-way branch 15" x 12" x 6".....	580	580	“	13 30
1	15	Reducing to 6".....	400	400	“	9 00
5	15	Saddles 15" x 6".....	122	610	2 $\frac{1}{4}$	13 72
9	15	Split Thimbles.....	260	2340	2 $\frac{1}{4}$	58 50
1	12	4-way branch.....	615	615	2 $\frac{1}{4}$	13 84
3	12	“ “ 12" x 9".....	500	1500	“	33 75
4	12	“ “ 12" x 6".....	475	1900	“	42 77
2	12	3-way branch 12" x 12".....	524	1048	“	23 58
3	12	“ “ 12" x 9".....	494	1482	“	33 34
1	12	“ “ 12" x 6".....	469	469	“	10 55
2	12	Reducing to 9".....	240	480	“	11 00
8	12	“ “ 6".....	200	1600	“	36 00
2	12	“ “ 6" with faucets.....	200	400	“	9 00

## PIPE SPECIALS.—(Continued.)

No. of pieces.	Diameter in inches.	DESCRIPTION.	Weight of one in lbs.	Total weight in lbs.	Value per lb. in cents.	Total value.
21	12	Thimbles .....	160	3360	2½	75 60
5	12	Caps .....	45	225	"	5 06
12	12	Saddle 12" x 4" .....	90	180	"	4 05
13	12	Split Thimbles .....	222	2886	2½	67 93
2	9	6-way branches 9" x 9" x 9" x 3" .....	450	900	2½	20 25
6	9	3-way branches 9" x 9" .....	355	2130	"	47 92
10	9	" 9" x 6" .....	335	3350	"	75 37
7	9	Reducing 9" to 6" .....	157	1099	"	24 73
3	9	Offsets .....	156	468	"	10 93
20	9	Thimbles .....	112	2240	"	50 40
1	9	Saddle 9" x 4" .....	45	45	"	1 01
23	9	Split Thimbles .....	139	2780	2½	69 50
7	9	Caps .....	34	238	2½	5 35
26	6	6" x 6" 3-way branches .....	209	5434	"	122 21
11	6	6" x 4" " .....	200	2200	"	49 50
4	6	6" x 3" " .....	131	524	"	11 79
6	6	Reducing to 4" .....	114	984	"	12 14
6	6	Reducing to 3" .....	105	630	"	14 17
6	6	Thimbles .....	75	450	"	10 12
8	6	Offsets .....	140	1120	"	25 20
4	6	Y branches .....	209	836	"	18 87
20	6	Split Thimbles .....	92	1840	2½	46 00
9	6	Caps .....	19	171	2½	3 84
2	6	Bends .....	140	280	"	6 30
21	4	4-way branches .....	123	2583	"	58 09
6	4	3-way branches .....	114	684	"	15 39
4	4	Y branches .....	96	384	"	8 74
7	4	Reducing to 3" .....	84	588	"	13 23
5	4	Offsets .....	66	330	"	7 42
27	4	Thimbles .....	29	783	"	17 64
5	4	Bends .....	83	440	"	9 90
2	4	Split Thimbles .....	64	128	2½	3 20
6	3	4-way branches .....	90	540	2½	12 15
4	3	3-way branches .....	60	240	"	5 40
6	3	Thimbles .....	29	174	"	3 91
12	3	Split Thimbles .....	48	576	2½	14 40
6	2	4-way branches .....	30	180	2½	4 05
1	2	Y branches .....	23	23	"	52
3	...	Fire hydrants .....	...	...	66.50	199 50
11	...	Castings for fire hydrants .....	418	4598	3	137 94
18	...	Bases for fire hydrants .....	140	2520	3	75 60
19	...	Jackets for fire hydrants .....	340	6466	3	193 80

## PIPE SPECIALS.—(Continued.)

No. of pieces. Diameter in inches.	DESCRIPTION.	Weight of one in lbs.	Total weight in lbs.	Value per lb. in cents.	Total value.
11	Extension pieces for fire hydrants . . . . .	124	1364	.03	\$ 40 92
24	Cast iron caps for fire hydrants . . . . .	5			3 60
12	Cast iron caps for suction hose . . . . .	9			3 24
	Brass castings all sorts . . . . .	50	50	.35	16 50
	Tin tubing . . . . .	200	200	.33	66 00
	Refined iron . . . . .	500	500	.01½	7 50
1	Bases for fire plugs 6" x 3" . . . . .	150	150	.03	4 50
4	Fire plugs without jackets . . . . .			50.00	200 00
					\$3399 48

## Joint Staves.

For 6 inch pipe.	For 9 inch pipe.	For 12 inch pipe.	For 15 inch pipe.	For 20 inch pipe.	For 24 inch pipe.	Key Wedges.	Cost of each.	Total cost.
5000	2700	1500	800	600	6000		\$0 11	\$140 00
						6000	0 04	50 00

## Valves.

No. of Pieces.	Size in inches.	DESCRIPTION.	Weight of one in lbs.	Total weight in lbs.	Value of each.	Total value.
1	12	Regulating Valve .....				\$206 66
1	6	" " .....				103 33
4	15	Stop Valves .....			\$60 00	240 00
3	12	" " .....			40 00	120 00
9	9	" " .....			25 77	231 93
46	6	" " .....			17 49	804 54
32	4	" " .....			15 00	480 00
4	3	" " .....			12 00	48 00
12	1	Service Stopcocks .....			2 50	30 00
18	3	" " .....			2 00	36 00
109	3	" " .....			1 60	175 40
6	3	" " Curb .....			1 60	9 60
4	15	Gun Metal Spindles .....	28	112	60	67 20
4	9	" " .....	14	56	60	33 60
6	6	" " .....	9	54	60	32 40
8	4	" " .....	6	48	60	28 80
12	3	" " .....	5	60	60	36 00
279						\$2583 46

## Meters in Stock.

No. of Pieces.	Size in Inches.	DESCRIPTION.	Value of each.	Total Value.
7	6	Siemen's Meters	\$143 42	\$1003 94
4	4	" "	86 75	347 00
9	3	" "	65 67	591 03
2	1 $\frac{1}{2}$	" "	34 42	68 84
5	1 $\frac{1}{4}$	" "	29 16	145 80
2	$\frac{3}{4}$	" "	15 50	31 00
11	$\frac{3}{4}$	" "	14 50	159 50
3	1	" "	21 50	64 50
20	2	Trident	62 60	1252 00
11	1 $\frac{1}{2}$	" "	37 60	413 60
25	1	" "	21 00	525 00
24	$\frac{3}{4}$	" "	17 60	422 40
73	$\frac{1}{2}$	" "	11 97	879 81
2	$\frac{1}{2}$	Crown	49 25	98 50
1	$\frac{1}{2}$	Hersey	21 05	21 05
1	$\frac{1}{2}$	Disc	12 34	12 34
1	$\frac{1}{2}$	Nash	14 49	14 49
1	$\frac{1}{2}$	Niagara-Buffalo Meters	13 19	13 19
12	$\frac{1}{2}$	Frost	31 42	62 84
1	$\frac{1}{2}$	Keystone	12 00	12 00

## Miscellaneous.

No. of Pieces.	DESCRIPTION.	Value of each.	Total Value.
1	Pipe tapping machine . . . . .		\$127 60
1	5 H. P. steam engine and pump . . . . .		625 00
1	4 H P gas engine . . . . .		475 50
3	Derrick winches . . . . .	\$ 7 00	21 00
2	Hand winches . . . . .	8 00	16 00
2	Platform scales . . . . .	25 00	50 00
.....	Tape packing for meters . . . . .		65 00
1	Tapping and boring machine . . . . .		80 00
3	Lathes . . . . .		200 00
5	Pressure gauges . . . . .	10 00	50 00
.....	Blacksmith's tools . . . . .		150 00
			\$1860 10

## Recapitulation.

DESCRIPTION.	No. of Pieces.	No. of Pounds.	Value.
Pipes . . . . .	2029	402721	\$7464 52
Specials . . . . .			3399 48
Joint Staves . . . . .	7660		222 50
Valves . . . . .	279		2583 46
Meters . . . . .			6138 83
Miscellaneous . . . . .			1860 10
			\$21668 89

## Rented Domestic Hydrants.

STREET.	LOCATION.
Cedar .....	N. E. corner Louisburg Street.
Wellington .....	S. W. corner Lundy Lane.
Duncan .....	N. side.
Duncan .....	N. E. corner Harvard Street.
Preston .....	S. W. corner Jubilee Road.
Tower Road .....	At Fay's Lane.
Duffus .....	Corner Gottingen Street.
Oak .....	S. E. corner Beech Street.
Sullivan .....	Opposite May's Brewery.
Atlantic .....	Corner Brussel Street.
Mott .....	Corner Seldon Street.
Yale .....	East end.

## Free Pumps Maintained by City.

No.	LOCATION.
1	Leahyville.
1	Lady Hammond Road.
1	Kempt Road.
1	Duffus Street.
1	Afrieville.
1	North Kline Street.
1	Campbell Road.
1	West Harvey for Haley.
1	Quinn Street.

## Hydraulic Hoists in Operation.

NAME.	BUSINESS.	Size of Service.	How Rated.
Dominion Government .....	Post Office .....	3 inch .....	Meter.
Dominion Government .....	Appraisers' Office .....	3 " .....	"
G. M. Smith .....	Dry Goods .....	4 " .....	"
Wm. Stairs, Son & Morrow .....	Hardware .....	4 " .....	"
Dillon Bros .....	Groceries .....	3 " .....	"

**Motors.**

NAME.	BUSINESS.	Size of Service.	How Rated.
Brunswick St. Church (Methodist) . . .	Organ . . . . .	2 inch . . .	Indicator.

**Drinking Fountains.**

No.	LOCATION.
1	Market Square.
1	St. Paul's Street, near Barrington Street.
2	Public Gardens

**ORNAMENTAL FOUNTAINS.**

3	Public Gardens.
1	Grand Parade.



## Service Pipes Laid.

Number.	Name of Owner or Agent.	Location of Premises.	No. of		Purpose for which water is used.
			Stopcock.	Size of Pipe.	
1	H. N. Harvey	S. side Duncan	6873	1	Dwelling.
2	A. G. Jones	N. side wharf	6874	1	
3	S. T. Cragg	S. side Lawrence	6875	1	Dwelling.
4	Jas. Skerry	E. side Pleasant	6876	1	"
5	N. Jackson	N. side Charles	6877	1	"
6	John McInnis	E. side Young Avenue	6878	1	"
7	B. H. Armstrong	S. side Quinpool Road	6879	1	Laundry.
8	Annie LeBlanc	S. side Quinpool Road	6880	1	Dwelling.
9	Monastery of G. Shepherd	N. side Quinpool Road	6881	1	Stables.
10	W. Ferguson	S. side Shirley	6882	1	Dwelling.
11	A. F. Pelton	N. side Williams	6883	1	"
12	A. F. Pelton	N. side Williams	6884	1	"
13	C. L. Torrey	E. side S. Bland	6885	1	"
14	Jas. Rankine	N. side Kaye	6886	1	"
15	W. H. Green	W. side Gottingen	6887	1	"
16	Chas. Evans	N. side North	6888	1	"
17	J. A. Withrow	Henderson & Potts' field	6889	1	Slaughter House.
18	R. L. Lessel	W. side Pleasant	6890	1	Dwelling.
19	A. Whitman & Co.	N. side Liverpool wharf	6891	1 1/2	
20	Philip McInnis	W. side Campbell Road	6892	1 1/2	Dwelling.
21	School Commissioners	S. side Kaye	6893	1	School.
22	R. F. Armstrong	W. side Union	6894	1	Dwelling.
23	Parker & Son	W. side Longard Road	6895	1	Planing Mill.
24	Neil Ross	S. side Kaye	6896	1 1/2	Dwelling.
25	J. Young	N. side Gerrish	6897	1	"
26	J. Young	N. side Gerrish	6898	1	"
27	J. Young	N. side Gerrish	6899	1	"
28	J. Young	N. side Gerrish	6900	1	"
29	M. E. Keefe	N. side Peperell	6901	1	Stables.
30	H. Green	S. side Peperell	6902	1	Dwelling.
31	E. Evans	N. side May	6903	1	"
32	D. Quinn	S. side W. Young	6904	1	"
33	J. McLellan	E. side School	6905	1	"
34	J. McKinlay	N. side Charles	6906	1	"
35	Elizabeth Ward	E. side Acadia	6907	1	"
36	Chas. Horton	W. side Pleasant	6908	1	"
37	R. V. LeMoine	S. side Russel	6909	1	Church & School.
38	Ward Bros.	E. side Agricola	6910	1	Dwelling.
39	M. Fahie	N. side Duncan	6911	1	Dwelling & Shop
40		E. side Hunter	6912	1	Barn.
41	J. M. Creighton	W. side Robie	6913	1	Dwelling.
42	Wm. Nichols	N. side Shirley	6914	1	"
43	D. M. Thomson	S. side Fenwick	6915	1	"

## SERVICE PIPES LAID.—(Continued).

Number.	Name of Owner or Agent.	Location of Premises.	No. of Stopcock.		Purpose for which water is used.
			No. of Stopcock.	Size of Pipe.	
44	Thos. Johnson .....	W. side King's Place.....	6916	1/2	Dwelling.
45	Thos. Deer .....	S. side W. Young.....	6917	"	"
46	Thos. Doyle .....	S. side W. Young.....	6918	"	"
47	Wm. Davis .....	S. side W. Young.....	6919	"	"
48	Elizabeth Allen .....	N. side Kaye.....	6920	"	"
49	Wm. Foster .....	E. side Windsor.....	6921	"	"
50	A. Westbury .....	N. side Quinpool Road ..	6922	"	"
51	W. K. Thomson.....	N. side Bayers Road.....	6923	"	"
52	Arthur Morton.....	W. side Robie.....	6924	"	"
53	J. S. Cashen .....	S. side Gerrish .....	6925	"	Shop.
54	Wm. McFatrige .....	S. side O'Connor's wharf.	6926	"	Stores.
55	W. H. McArthur.....	S. side North .....	6927	"	Dwelling.
56	J. Gray .....	N. side Willow .....	6928	"	"
57	J. Irving .....	W. side Union .....	6929	"	"
58	Catherine Garrety .....	S. side Cedar .....	6930	"	"
59	R. S. Theakston .....	W. side Henry.....	6931	"	"
60	G. J. Artz .....	W. side S. Bland.....	6932	"	"
61	J. M. Bateman .....	E. side S. Bland.....	5933	"	"
62	N. A. Nicholson .....	S. side Quinpool Rord....	6934	"	"
63	L. J. O'Connell .....	N. side Shirley .....	6935	"	"
64	Orphanage.....	E. side Veith .....	6936	"	School.
65	J. A. Gray.....	S. side Williams.....	6937	"	Dwelling.
66	John B. Douglas .....	E. side Birmingham.....	6938	"	"
67	St. Patrick's Home.....	W. side Mumford Road....	6939	"	Stables.

## Detailed Precipitation for the year 1904.

CITY OF HALIFAX.												
Day.	January.		February.		March.		April.		May.		June	
	Dura- tion.	Inches.	Dura- tion.	Inches.	Dura- tion.	Inches.	Dura- tion.	Inches.	Dura- tion.	Inches.	Dura- tion.	Inches.
1	2.0	.049	11.5	.800					2.0	.096		
2	22.0	1.400	5.0	.240		T.					5.0	.153
3			5.0	.220	6.3	.310	1.0	.010			3.5	.046
4					5.0	.440					1.0	.033
5			6.3	.260							10.0	1.350
6			5.8	.200							1.0	T.
7	4.5	.060	9.0	.380	.7	.010	4.2	.135			10.0	.152
8	.4	T.	1.0	.028	12.3	2.060	4.5	.450			.8	T.
9	8.4	.344			1.0	.010	11.0	.998				
10	2.0	.060	.5	T.			16.5	1.038	4.8	.287		
11							2.4	.170	3.0	.100		
12			4.0	.100			1.0	.082	6.0	T.		
13					1.2	T.	3.0	.246				
14	8.8	1.158			1.0	T.						
15	.5	T.	5.5	.500	3.0	.020	.5	T.				
16			7.8	.580	7.0	.120	12.0	.660	2.0	.108	.6	.196
17	9.6	.260	1.0	T.					.4	T.		
18									.4	T.	.1	T.
19	.5	T.	3.0	.080	12.5	.800	8.7	.393	20.0	1.824		
20	1.0	.010	2.0	.250	16.4	.430	2.1	.200	8.0	.674		
21	5.2	.070			.8	T.	9.5	.660	2.0	.100		
22	3.5	.160	11.5	1.180	1.5	.030					2.5	.043
23	12.5	.758	.5	T.	14.5	1.020			4.0	T.	2.0	.218
24	9.0	.628	7.5	.410								
25	.7	.030	5.0	.100	.2	.010					14.5	.043
26					7.0	.132			1.0	.065	2.0	.382
27	5.0	.600			3.5	.070					3.0	.010
28					2.0	.030						
29	3.4	.140	.5	T.		.100	10.5	.516			.5	.010
30	5.0	.200					7.5	.354	.2	T.	.8	.032
31									3.0	.061		
Total		6.318		5.328		5.590		5.912		3.315		2.668

Total precipitation for the year 57.194 inches.

## DETAILED PRECIPITATION FOR THE YEAR 1904.—(Continued).

Day.	CITY OF HALIFAX.											
	July.		August.		September.		October.		November.		December.	
	Dura- tion.	Inches.	Dura- tion.	Inches.	Dura- tion.	Inches.	Dura- tion.	Inches.	Dura- tion.	Inches.	Dura- tion.	Inches.
1	.....	.....	.....	.....	.....	.....	1.0	.022	.1	T.	4.0	.164
2	6.0	.312	1.1	.040	2.0	.024	1.0	.020	.....	.....	.5	T.
3	0.7	T.	3.9	.353	7.0	.087	.....	.....	.....	.....	.....	.....
4	.....	.....	.....	.....	10.0	.541	.....	.....	1.7	.053	.....	.....
5	.....	.....	.....	.....	.....	T.	.....	.....	.9	T.	.....	.....
6	.5	.001	.....	.....	4.0	.226	5.5	.290	7.5	.536	1.0	.050
7	.....	.....	.5	.010	.....	.....	3.0	.084	.5	T.	2.0	.112
8	.....	.....	2.5	.208	3.5	.032	.....	.....	1.7	T.	3.8	.213
9	.....	.....	2.0	.100	.....	.....	8.5	.066	.....	.....	.....	.....
10	.....	.....	.....	.....	.....	.....	11.8	.204	.....	.....	.....	.....
11	.8	.063	11.5	.950	.....	.....	17.6	.494	.....	.....	3.0	.020
12	.....	.....	.....	.004	5.5	1.204	.....	.....	.....	.....	.....	.....
13	0.1	T.	.....	.....	.....	.....	12.0	.700	1.5	.092	10.0	.250
14	4.0	.932	7.0	.640	.....	.....	7.0	.478	15.5	.862	3.5	.050
15	.....	.....	12.0	.760	.2	.016	1.6	.010	.1	T.	.....	.....
16	.....	.....	.....	.....	.....	.....	.....	.....	5.5	.073	.....	.....
17	.7	.032	12.5	.530	.....	.....	.....	.....	2.0	.075	.....	.....
18	.....	.....	.....	.....	.....	.....	.....	.....	7.0	.179	12.0	1.170
19	2.5	.010	.1	T.	.2	T.	.....	.....	8.0	.174	.....	.....
20	.....	.....	2.8	.047	.....	.....	.....	.....	.....	.....	6.0	.310
21	.....	.....	9.0	2.440	3.8	.425	.....	.....	.....	.....	.....	.....
22	.....	.....	.....	.....	.3	.021	3.2	.480	.5	.028	.5	T.
23	3.3	.064	8.0	.429	.....	.....	6.5	1.910	.....	.....	11.0	.270
24	6.0	.909	.....	.....	2.0	.070	.....	.....	11.5	2.088	2.0	.010
25	.....	.....	.....	.....	12.2	1.190	.....	.....	1.8	.124	.....	.....
26	.....	.....	.1	T.	.....	.....	.3	T.	.5	T.	.....	.....
27	.....	.....	.....	.....	1.5	.038	3.0	.273	.....	.....	5.0	.320
28	.....	.....	.....	.....	.....	.....	.....	.....	6.3	.100	22.0	1.540
29	.8	T.	.....	.....	.....	.....	.....	.....	4.0	.128	1.2	T.
30	.....	.....	.....	.....	15.0	.628	.....	.....	13.5	.595	1.0	.010
31	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3.0	.100
Total	2.323		6.511		4.502		5.031		5.107		4.589	

## Detailed Precipitation for the Year 1904.

Day.	CHAIN LAKES.											
	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
1		.91			.10					.05		.13
2		.21		.54		.02	.52	.05	.03			
3		.35		.06		.36	.05	.31	.15			
4	1.25		.84						.62		.07	
5		.20				1.11			.06	.15		
6						.15	.04		.24	.19	.48	.10
7		.61				.15			.03			
8		.14	1.43			.03				.09		.23
9	.70		.36	.68				.20		.32		
10				1.29	.39					.45		
11	.07			.16	.23		.05	1.00		.06		
12		.10						.05	1.15	.37		
13				.41						.66		
14	1.68						.56	.09		.03	1.35	.40
15								1.22	.02			
16		.72	.19	.86		.10					.04	
17	.96				.05		.04	.44			.13	
18											.21	
19			.75	.70	2.43						.17	1.24
20		.33	.50		.63							.32
21	.10			.90	.13			2.52	.44		.02	
22		1.35				.06			.02	.15	.04	
23	1.09	.37	.92			.22	.02	.49		2.85		
24	.46						1.92				1.50	.30
25						.03			1.41		.88	
26	.65	.79			.06	.33						
27	.12	.11							.03	.31		
28			.13								.10	2.27
29	.08		.20	.35								.05
30	.16			.43		.04			.69		.76	
31					.05							
Total	7.32	6.19	5.32	6.58	4.07	2.60	3.20	6.37	4.89	5.68	5.65	5.04

Total for the year..... 62.81 inches.