

PAGES

MISSING

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Provincial Unions of

MANITOBA, BRITISH COLUMBIA, ALBERTA, SASKATCHEWAN
NOVA SCOTIA AND NEW BRUNSWICK.

CANADIAN INDEPENDENT TELEPHONE
ASSOCIATION.

CHIEF CONSTABLES ASSOCIATION OF CANADA.

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Letters are invited on all subjects relative to municipal matters, and those of a critical nature will be welcomed and given a place so long as they are proper and free from personalities.

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The New Year

With this issue, the Journal starts on its Sixth year, which it has attained, in spite of indifference and hostility. It has naturally had to meet competition, and has had also, unfortunately, to contend with competitors who do not scruple to rely upon untruths to support their statements about it. But, on the other hand, the Journal is glad to feel that it has made many friends all over Canada, and even in other countries, and its appreciation of the kindness and support which it has received cannot be put into type.

During the past year the total number of copies issued was 44,150 including, with the cover, 608 pages. As will be seen from the Index, the Volume contains articles upon a wide variety of subjects, by men who are in many cases experts in their own lines. Besides, it published the Official Reports of many Conventions, which contain matter of great value.

In looking forward, many improvements are very evident. Some are impossible, and need not be thought of. But it is intended to condense the reports which are published very considerably, for it has been necessary to hold back many pages of valuable matter, and at present, there are some very interesting articles, standing in page form, waiting for space. In the year now commencing, it will be the aim of the Journal to give more, but shorter, reports and articles, and thus endeavour to cover more fully the many phases of Municipal Interests.

We trust the New Year may prove a Very Happy and Very Prosperous one for all our readers.

Not a Grafting Firm

An investigation has been held into the methods of purchase in connection with the Good Roads movement in Oxford County, Ont., some witnesses swore that commissions had been asked for by the officials. One named James A. Vance swore that he paid an official \$50, in order to get his signature in securing the order for a bridge. Vance is described as "Agent of the Hamilton Bridge Works" in an article in a recent number of the Toronto "Globe", which appeared with scare head lines, which read "Graft and Good Roads seem strange Bedfellows".

It is needless to say that a firm of the reputation of the Hamilton Bridge Works would not condescend to such dirty work, and it appears that Vance has absolutely no connection with the Hamilton Bridge Works as either an employee, or even agent. He does work in bridge-building on his own account, purchasing the material and erecting it, without any responsibility for, or connection with, the work on the part of the firm where he happens to have got the materials.

It is a pity that such a misleading and incorrect statement should have appeared in a paper like the "Globe", reflecting, as it did, on a firm of long continued high standing.

Civic Lighting for Montreal

The unsatisfactory relations between the City of Montreal and the Montreal Light, Heat and Power Co. (formerly the Royal Electric Co.) have led to a very strained position. When the Company faced competition some years ago, it seemed to yield and hauled down the price from \$120 per arc lamp to \$65.00 — but a clause was slipped into the contract permitting the Company to change the style of lamp, and the arc lamps were quickly replaced by enclosed alternating arc lamps and the streets became gloomy and badly lighted, as everyone, stranger and citizen who travelled, noticed. The termination of the contract brings up the question of improvement, and an agitation has been started in favour of a civic lighting plant.

Naturally, Messrs. Ross and Holgate, C. E., who, (along with City Engineer Fellowes), installed the combined garbage incineration and lighting plant, at Westmount, Que., were called in and have drawn up a report which is given below. It is well to know that the estimated cost per arc lamp in Westmount, for 120 lamps, was \$75; and that the cost the first year was \$66.50, while this year the actual cost, for 180 lamps, has been \$65, or eight dollars per lamp less than was estimated; further that the report for the year's working, when issued, will show a profit, after charging fully for operating, depreciation, interest and sinking fund, of \$19,000 dollars! This justifies the offer of Messrs. Ross and Holgate to pay the city of Westmount \$10,000 a year for five years, and run the plant for the City; their profit this year would have been \$9,000.

It should be understood that the cost of producing electricity is paid for to the Health Department by paying the nett value of the garbage, which is about the cost per year.

On the other hand, the Light, Heat and Power Co. have water-power, which is considered as costing one-half that of coal; and they buy power from the Shawinigan Co., delivered in Montreal, at \$14 per h. p. So they ought to be able to cut considerably below the cost at Westmount.

The following is a brief summary of Messrs. Ross and Holgate's proposal for Montreal:

The total garbage collected in 1905, as shown by the Health Department, was 84,486 tons, being a daily average of 230 tons; the maximum daily power available from this is 19,800 kilowatt hours, of which 7,330 would furnish the 2,200 arc lamps, leaving 12,470, or 1,333 h. p., and which could be used for pumping or sold.

The conclusions are: that the City has sufficient garbage to light the City, and also to pump most of the water used by the citizens; that the clinkers would be available for roads; and that the collection of garbage could be simplified, and its destruction made inoffensive and sanitary.

A plan has been prepared for the Western Division only. Here the total garbage in 1905 was 29,025, and the daily average 80 tons. This would give 8,640 kilowatt hours, which would supply 733 arc lamps, and 500 h. p. besides.

The cost of installation is estimated as follows:

| | |
|----------------------------|-----------|
| Destructor Plant | \$102,960 |
| Electric Plant | 73,260 |
| Street Equipment | 108,850 |
| | <hr/> |
| | \$285,070 |

The operating costs of the destructor, including interest, sinking fund, depreciation and repairs, are \$24,276 per year, from which \$13,324 is deducted for the present incinerator, which would be replaced. This would give the cost for 330 h. p. for 24 hours at \$33.

Similar operating costs of the electric plant would be \$40,867, so that the total operating costs of the combined plants would be \$57,819, assuming that the value of the extra h. p. is \$30 per year; this means that the 733 arc lamps would cost the City \$57.18 each.

The result of a plebiscite taken last month shows that the ratepayers are in favour of spending two million dollars on a civic electric plant.

The Cement Merger's Defence

The Cement Merger is not being allowed to drop out of sight, but the circular letter, sent out by the Union of Canadian Municipalities, is being taken up, and generally warmly endorsed by municipalities all over the Dominion.

Mayor Oliver, Toronto, promised that not only will Toronto back up the action of the Union with moral support, but also with pecuniary assistance, if necessary.

Meantime, it remains to be seen how far the Merger with still increase the prices, and that is practically dormant while the winter lasts. The Combine in England is on the spot, and is prepared to enter this field, if prices are forced up here.

The Merger has not been idle on its side, but has issued a series of advertisements in the leading papers, in which short sermons have been preached to the readers, showing the perfect innocence of the Merger, which aims only at giving the consumers the lower prices which are possible by amalgamation.

These advertisements are double-barreled, as they not only show the readers the point of view of the merger, but effectively shut off any possible criticism on the part of the paper. So the readers of the papers in which these advertisements appear, are only allowed to know one side of the question.

Not Municipal Failures

The City of Winnipeg, Man., was without light, power and cars for several days, owing to an accident in the water power plant of the Street Railway Co., which is the electrical monopoly of the city. The tremendous inconvenience of such a thing can hardly be imagined, especially as electricity has been so largely depended on for light. It was understood that the Company has a stand-by or reserve plant to be operated by steam in case of accident; but it did not meet the "long-felt want".

The City of Hamilton, Ont., has been a sufferer also from a similar cause, namely the failure of the Cataract Power Co. to overcome an ice-jam. This is the more remarkable, as in a recent article in a journal which stands for the companies as against municipal ownership, the statement was made that this Company had such perfect arrangements that no ice-jam could affect it. Of course, this was an argument to aid in keeping back the contract with the Hydro-Electric Commission.

It is well to remember that these accidents did not happen to municipally owned plants, but to those of companies which have been fighting to keep the citizens from adopting a publicly owned power system.

Water Supply and Purification



T. AIRD MURRAY, C.E., Toronto

Consulting Sanitary Engineer to the Saskatchewan Government

Paper read before the Convention of the Municipalities of the Province of Saskatchewan, at Regina.

The general question of water supply is an extremely wide one. The question of purification is no less wide. It would be impossible for me to do justice to the subject within the limits of a single paper. If I attempted to deal with the various headings into which the subject may be divided, such as available rainfall and other sources of supply, (such as direct collection of rainfall, springs, wells, streams, rivers, lakes, and storage reservoirs, and the different values to be attached to shallow wells as against deep wells, the various methods of water purification by means of chemical re-agents, slow or rapid sand filtration, sterilisation, etc.), I feel sure that such a dissertation would only weary you, and my observations would be so incomplete that no definite data could be conveyed.

I have, therefore, as it were, mentally reviewed the whole subject with a view to selecting one or two particular phases of the problem of water supply which I consider are more particularly of practical value as effecting general economy and efficiency. The subjects which I have selected are: — "Tuberculation and growths in water mains—their prevention and removal," and "Purification of Water by Mechanical Filtration." Even to treat these two subjects conclusively would present a gigantic task, — no one expects however, that more than the salient features can be touched upon in a short paper.

Tuberculation and Growths.

These may be divided as follows — (a) Rust, (tuberculation), (rust nodules); (b) Incrustation due to alkalinity; (c) Biological formations due to organisms; (d) Sedimentary deposits. All of the above, either separately or together, frequently occur in water mains. They are the cause (apart from extended distribution) of the gradual diminution of pressure so common in our water systems. They are the further cause of the gradual and sometimes enormous increase in power required to maintain necessary pressures.

Mr. Desmond Fitzgerald (Transactions of the A. S. C. E., Vol. 15, p. 337, 1886) states: "Great attention is paid by hydraulic engineers to the designing of dams,

aqueducts, reservoirs, etc., structures connected with the source of water supply; but, the question may well be asked: "Is proper attention paid to the pipe or distribution system?" Experiments and formulas we certainly have of the flow of water through pipes, but the writer is inclined to believe, as the result of observations, that when the water has once been turned into a pipe system, little more attention is paid to the condition of the pipes. Sometimes, it is true, small pipes fill up entirely, and then the specimens are exhibited showing the growth of tuberculation. Again, the water becomes bad in one street whilst it is good in the adjoining neighborhood, and, the result is attributed to some mysterious agency. It is believed by the writer that one of the great steps in advance that will be made in years to come in the designing of pipe systems will be the introduction of facilities for cleaning out the pipe at stated intervals of time. This will be found necessary, not so much for restoring the normal capacity of the pipes as for maintaining the purity of the water."

The above statement was true twenty years ago when it was made, and it is equally true to-day. Numbers of water systems can be pointed to, where the water as delivered at the tap is more impure than the water at the source, and where it becomes, year by year, more difficult and expensive to maintain satisfactory pressure owing to the reduction of the diameter of the pipes.

Although much attention has been given to the subject of growths in water mains and their removal in Great Britain, comparatively little has been given in this Continent. Where attention has been given, however, the results have provided the utmost satisfaction, both from an economical and efficiency point of view. Electric Engineers are careful to provide inspection boxes on their transmission lines, and even sewers are provided with manholes which allow of inspection; but, as a rule no means are provided for the general inspection of the condition of water mains, or facilities provided for cleaning out even the dirt which will accumulate apart from the removal of rust and other growths.

Before going into the question of the removal of tuberculation and growths it may be well to shortly review what knowledge we have of these incrustations.

Tuberculation is the term applied to rust or oxide of iron which forms on water mains, principally in such mains where pipes have not been originally properly protected with some coating mixture. Small pipes may become completely choked with rust. With large pipes, however, there appears to be a limit to the thickness of rust, an inch and a half of incrustation provides a protection to the body of metal forming the pipe. Rust incrustation in pipes commences as a rule as small specks appearing at points where the protective coating leaves the pipes exposed. The specks grow rapidly in the form of nodules like limpets, gradually covering the whole internal surface and eating under the protective coating which they scale off and destroy. These limpet shaped cones, or rust tubercles, as they are called, are generally hard on the surface and soft inside, and are easily removed by scraping. The rust is the result of a combination of the iron with the air which is always present in water; it occurs equally with filtered or unfiltered waters, and grows at greater rapidity with soft waters than with hard. In fact under certain hard waters rust tuberculation is practically unknown, even with uncoated pipes. The tendency to rust growth with soft water is due not to the degree of softness or hardness, but due to the fact that most soft waters are of surface origin and contain vegetable acids, such as carbonic acid due to organic fermentation. One thing is certain, and that is

that no tuberculation will occur where the internal lining of the pipes is properly protected. Rust tuberculation means the gradual diminution of the pipe thickness, and consequent weakening.

There are, however, other incrustations which are not dependent upon the amount of protection to the pipe surface, but such as may be due to alkalinity. Hard water is caused, principally, by the presence of salts of magnesium and calcium. The carbonates and bicarbonates of these salts produce temporary hardness; permanent hardness on the other hand is produced by the sulphates, chlorides, and nitrates of these salts. In the case of the salts producing permanent hardness, we have the incrustations found in boilers due to evaporation of the water leaving the salts behind; these do not affect the distributing mains. In the case of the salts producing temporary hardness, however, we find that the carbonates are soluble in the presence of carbonic acid, and form incrustations of crystallized scale of calcium carbonate. This scale is found in large quantities in some places, depending upon the quantity of bicarbonate of lime and carbonic acid in the water. The usual method of removing temporary harness is to add milk of lime according to "Clarke's" process for softening water.

Biological formations, due to organisms, are frequently found as growths in water mains and concrete or brick conduits, and exist as "Sponge"; "Pipe moss"; "Ferruginous slime"; etc. These, as well as, curtailing the diameter of the pipes and reducing pressure, cause impalatable conditions, and even foul odours from the water. The most serious of these growths is that known as "ferruginous slime", which is the product of certain iron organisms known as the "Grenothrix group". The deposit is generally black, or red, or of a dirty yellow, or brown color; and flocculent masses may often be seen floating, which have become disengaged from the pipes. The writer has seen this deposit lining a water main to over an inch in thickness. The iron which is contained in the slime is not due to the pipes, but is entirely due to iron in the water, and has nothing to do with the question of rust formation; as it may form in brick or concrete conduits, as stated above. It just as readily forms in coated pipes as uncoated, and it is for this reason that many do not consider it necessary to use coated pipes, confusing this organic iron growth with rust. The writer has had occasion to make several observations and experiments in connection with this particular growth and concludes that it is due to a combination of iron in solution, and organic impurities in the water. The growth is more common in connection with ground waters, and in this continent has made itself evident at Jamestown, N. Y., Brookline, Walthertown, and other places in Massachusetts. It is also very common in the surface waters of English towns, especially in the waters from the Pennine Range of Hills. I regret that I have not yet had an opportunity of studying the waters of this Province in order to make a systematic examination as to their relation to the particular growths with which I am dealing. This, however, is something for the future, and I have no doubt that many of you are practically acquainted with many of the growths noted.

Sponge or Spongidae is the chief cause of many waters becoming foul in Autumn time. It dies during the Autumn, and in the process of decay imparts an unpalatable taste and odour to the water. It is really a fresh water sponge. They are usually found on the tops and sides of pipes. They only occur in connection with surface waters, more especially in the case of lake water.

Pipe moss forms an extremely common growth in water mains, and may take the form of matting, cover-

ing large areas to considerable thickness. It is very permanent and is not usually found floating, as may be the case with the iron and sponge. It has all the appearance of moss, and may take the form of branching, thread-like filaments.

All of the above forms of organic growths "Ferruginous slime", "Sponge", and "pipe moss" can be readily removed by scraping, or can be prevented from forming by filtration. Filtration is really the permanent method of providing against organisms entering a water supply.

Sedimentary deposits are too well known, and require little explanation. Such are common when the water is obtained from rivers or turbid sources. Mud, sand, and clay are their chief constituents.

The above incrustations may be again summarized along with remedies required for their prevention or removal.

| INCRUSTATIONS | PREVENTION | REMEDY |
|---|---|----------------------------------|
| Rust tuberculation or rust nodules..... | Well coated pipes..... | Scraping the mains. |
| Incrustation due to alkalinity..... | Treatment with milk of lime..... (Clarke's process) | Scraping the mains. |
| Biological growths.... | Filtration..... | Scraping the mains. |
| Sedimentary deposits. | Sedimentation in basins with, or without, coagulents..... | Flushing and scraping the mains. |

Now, even after taking all the preventive measures necessary with many waters, it will be found that mains will still have a tendency towards incrustation. The question, therefore, arises as to whether money would not be well spent in the first instance in providing sufficient means of control over a water system to allow any length of main to be readily cleaned out at any time. The usual method of providing control is by means of hatch boxes placed at intervals on the lengths of mains. These allow of an opening to the main being made without cutting into it and breaking into the roadway. Scraping machines, of which there are many in the market, are simply cutting tools which are forced through the pipes by the pressure of the water, and have the effect of increasing the pipe diameter to the original bore. The percentage of pressures gained at various places in England immediately after scraping the mains, varies from 7 per cent. on a 6 inch. main in Thurso up to 300 per cent. on the same sized main in Omagh.

At Halifax, N. S., Canada, the effect of removing incrustation was most marked. The mains there are scraped out yearly. The first operation occurring in 1880 brought about 34.2 lbs. per sq. in., pressure at 25 hydrants at which the nozzles previously showed no signs of water. In 1881 the same hydrants showed 43.5 lbs., and in 1882, 52.4 lbs. The Engineer reported that the mains were all heavily tuberculated, in some instances the incrustation being 1.1/2" thick. Similiar experience was gained at St. John, N. B., and at Boston, Mass. Scraping the pipes more than doubled the supply of water. It is quite practical to remove the whole of rust or other growths from mains without injuring the original coating of the pipes.

Mr. N. S. Hill, before the American Works Association, has recently given some interesting figures upon the cost of scraping water mains. He takes for example a 6" main to cost \$1.00 per foot, and to require replacing with another main of the same size in 20 years, owing to the increased consumption and the effects of tuber-

cular deposits. Assuming money to be worth 4 per cent. per annum, then the cost of a new main at \$1.00 per foot, 20 years hence, would be equivalent to 46 cents at the present time. Assuming that by proper inspection and cleaning the construction of the additional main could be delayed 10 years; the cost of a new main 30 years hence would be equivalent to 30 cents at the present time, viz.: — $46 - 30 = 16c.$ per foot would thus be saved, which at 4 per cent. equals 64c. per foot per year, add to this the saving in interest on \$1.00 per foot for 10 years = 4c. per foot per annum, and we have

$$64 \times 20 = 12.8$$

$$4 \times 10 = 40$$

—
= 52.8 cents per foot of 6 inch main as the

amount we should be justified in spending in maintenance during 30 years, in addition to present cost in repairs, which we assume to be the same, and which averages about 17 cents per foot per year for all sizes of mains. In other words, we would be justified in spending just 10 times as much for maintenance as we do at present even if all the pipes were only 6 inches, if the periods are reduced to 10 and 20 years respectively, which is more probable with heavy incrustations, then the justifiable expenditure for maintenance would be 48.4 cents per foot for 20 years, and 2.42 cents per foot per annum, which would be sufficient to clean the mains every five years

A great deal more could be said on this subject from the economic point of view in connection with pumping and forcing water through incrustated mains. Atlantic City, N. Y., suffered for many years as a result of tubercular growths in the water mains. As a result of cleaning out the mains the pumping efficiency was increased as follows: — Before cleaning, the 10,000,000 gallon pump, which delivers the water into the reservoir, was put under a pressure of 110 pounds, and made 11 revolutions per minute, delivering 11,888,000 gallons. After cleaning, under the same pressure it made 16½ revolutions per minute, delivering 17,820,000 gallons, showing an increase in delivering capacity of 5,400,000 gallons in 24 hours, or 45.4 per cent. This enabled the department to fill the reservoir, and saved a contemplated expense of laying an additional main 30" (18,000 feet) at that time. Also, the amount saved in fuel required before, and after, the pipes were cleaned worked out at about 36 per cent.

Now supposing that a municipality contemplated putting down a water system with ample provision for control by means of hatch boxes, so that the system might be examined and scraped at any time without disturbing roads or cutting into the mains. What would be the cost? It is estimated for a population of 50,000 with 92 miles of main averaging 12 inches in diameter, the cost of distribution system amounting to \$1.80 per foot of main, consumption at 60 gallons per head per day, that the cost for an ample supply of hatch boxes would add 15 cents per foot of main, or 8.3 per cent. increase to distribution system. If the supply be one of pumping, the increase on the total cost of plant amounts to about 4.7 per cent.

Experts on this question, and in fact all who have had experience in this matter, are agreed that the actual cost incurred by the installation of hatch boxes, intelligently spaced out, is more than balanced by the benefits obtained.

Mechanical Filtration.

There is a rapidly growing opinion that all surface collected waters, especially those drawn from rivers,

should undergo some purification process before being delivered for consumption, as apart from the direct discharge of sewage into water courses there are many other sources of contamination. We have seen that many of the biological growths occurring in water mains are directly due to organic impurities in surface water. The removal of these impurities ensures longer life to the mains, more constant pressures, and a water free from mal-odours, bad tastes, and less contained nutriment on which pathogenic bacteria can be maintained.

Water purification may be effected by (a) filtration; (b) direct sterilisation.

Filtration may be divided into two processes, 1st, Slow sand filtration, and 2nd, Rapid mechanical filtration.

1. Slow sand filtration necessitates large areas of filter beds, and very fine grained sand is used. The purifying powers of these filters is primarily due to the formation of a sediment blanket on the surface of the filter. At first very little bacterial purification results, but as the sediment scum forms, the percentage removal increases up to very high rate efficiencies, gradually as the scum or blanket thickens, the rate of filtration is lowered until it is necessary to remove the scum by scraping; until the scum blanket forms, the water passing through the filter is passed to waste. The filter beds are generally about 1 acre in area, the rate of filtration being about 2,000,000 gallons per acre per day. This system has been adopted largely in Europe in connection with river waters. Its introduction has invariably been followed by a marked reduction in the typhoid fever rate. Several Cities in the American States have also adopted the system. Toronto is at present putting down a large plant to treat 30,000,000 gallons per day. The system, as compared with others, is very expensive, both in first charges and in maintenance, and it is doubtful whether it would be possible to work it under the severe frost conditions of this Province.

2. Mechanical or rapid filtration occupies a much smaller area. The sand used is coarser than in the case of slow sand filtration. The rate of filtration is about 120,000,000 gallons, per acre per day, or 60 times the rate of slow sand filtration. With municipal plants the size of a single filter is equal to about a hundredth part of an acre. Very high purification efficiencies are obtained by this method. Efficiency depends not so much upon the filter, however, as upon the use of a coagulant, and general attention and care to proper working. At Harrisburg, Pa., the average bacterial removal for the year 1908 was 99.62 per cent. Similar high efficiencies were obtained elsewhere. The filter is constructed more to a view of obtaining an efficient sand washing apparatus, while purification is obtained by the proper use of a coagulant, combined of course with the filter action.

This system is peculiarly adapted for our Province, as the whole plant can be housed in a small building and thereby worked independently of severe frost. Its power of removing turbidity is very great, and we are all well aware how turbid our rivers are in the early months of the year. I saw this for myself last July in visiting Saskatoon and Prince Albert, where, although small sedimentation basins were provided, the finer particles of the suspended matter remained in the water.

With reference to the use of a coagulant, I will quote from a report of the "Joint Special Committee to examine and report relative to the pollution of water supply, and the best method of filtration." City Document No. 15 of the City of Providence, R. I., as follows:—

"If the diameter of matter floating about in water is much less than that of the interstices between the grains of sand composing the filter-bed, such matter, except as

much as is caught upon the sharp edges of the quartz, will go right through the filter with the water.

"Now, if a substance could be introduced, drop by drop, into the water before it comes to the filter-bed, which would have the effect of curdling the matter together, so that every one hundred or so of the smaller particles were made to join together and become one large particle, much as vapour or steam is condensed into drops, it would follow that they would be caught and held from going through the filter. This is accomplished by adding dissolved sulphate of alumina (Alum) to the water as it flows to the filter.

"The amount required is from almost none at all to about three-quarters of a grain, according to the state of the water, say, an average of from one-quarter to one-half grain per gallon in the ordinary condition of the Pawtucket River water.

"The action is the same as when coffee is cleared by means of the white of egg. No white of the egg goes to the drinker of the coffee — it is all drained out with the grounds; and, as no alum goes to the drinker of the water, it unites with the impurities in the water and settles in feathery flakes of insoluble hydrate on the top of the filter, and is washed out with its accumulation of impurities when the filter is cleaned.

"The analysis of the purified water shows no trace of the alumina used, while the analysis of the wash water shows that the alumina is all washed out with other impurities. This feathery bed of precipitate flakes produced by the alum forms a filtering material of insoluble mineral water which is well nigh perfect in its character. Bacteria are like the very fine particles of clay of some water, so small as to pass the sand or quartz, but they are caught by the feathery precipitate of alumina hydrate, much as the bacteria contained in the air are prevented from entering a vial closed with sterilized cotton."

The above is an exact description of the use of a coagulant, and its importance in the use of a filter will be at once appreciated, when it is explained, that, one drop of alum in solution to one hundred thousand drops of water (about one sixteenth of a grain to the gallon) is sufficient to render an average turbid water bright.

What we all look to, however, is a practical example. I have mentioned the case of Harrisburg, Pa., where, with care and proper attention they have obtained an efficiency equal to anything which could be expected from any known process. I now give you the details of last years analysis of the Harrisburg Plant, as below:—

The full analysis of a year's working leaves nothing

to be desired as far as efficiency is concerned, and the results compare favorably with the averages of slow sand filtration; they will also compare equally with the best results. But what of the cost? The cost of mechanical filtration like any other process varies considerably, depending upon local conditions. At Harrisburg, we have the operating expenses for the year 1908, which are worth quoting, in view of the fact, that I give the results of the plant as a typical example of efficiency. The Water Commissioners of Harrisburg treat 3,358,029,150 gallons, per annum, of which 3,271,782,550 were delivered to the pumps, and 86,246,600 gallons, or 2.6 per cent. of the whole was used in washing.

The annual cost for 1908 was as follows:—

| | |
|-------------------------|-------------|
| Coagulant | \$5,919.27 |
| Coal | 2,043.92 |
| Oil and waste | 297.39 |
| Supplies | 837.95 |
| Repairs | 639.89 |
| Laboratory | 1,395.76 |
| Labor | 8,209.33 |
| | <hr/> |
| | \$19,343.00 |

The above amounts to a charge of \$5.91 per million gals. Coagulant cost per million gals. \$1.81, coal 62 cents, repairs 20 cents, laboratory 42 cents, and labor \$2.51.

This cost per million gallons at Harrisburg of \$5.91 is a fair estimate of probable cost when nothing is spared to obtain efficiency. In certain cases the cost will be much under this amount, — in others, over.

Now the assertion may be made, "But this method of mechanical filtration is not a perfect one", Efficiencies are given of something over 99 per cent.; but, what about the remaining bacteria which may be dangerous to health, and the percentage number of which remaining must depend upon the original number to start with?" To this assertion, only one answer can be given. Science has not yet discovered any method which can guarantee absolute perfection in purification of water methods.

The fact that one hundred per cent. efficiencies have not yet been obtained in practice by any method of purification of water by filtration, has led to many experiments being made in sterilisation. It is admitted that any system of straining or filtering, even if aided by the formation of a scum blanket, as in slow sand filtration, or by addition of a coagulant, as in the case of mechanical filtration, will still allow some bacteria to

Analysis of Raw Water and Filtered Water at Harrisburg for the Year 1908.

| Daily Average for the Month of | Bacteria. | | | Efficiency | | Turbidity. | | Color. | | Alkalinity. | | | Grains per Gallon Coagulant. | | | Length of Runs. | | | Average Rate per Million Gallons per Acre per Day. | Tap Water. | | |
|--------------------------------------|-----------|-------------|-----------|-------------|--------|------------|-----------|--------|-----------|-------------|-----------|-------------|------------------------------|--------------|--------|-----------------|----------|--------------------|--|------------|------------|--------|
| | River. | Sed. Basin. | Filtered. | Sed. Basin. | Plant. | River. | Filtered. | River. | Filtered. | River. | Filtered. | Parts Used. | Sed. Basin. | Coag. Basin. | Total. | Hours. | Minutes. | % Used in Washing. | | Bacteria. | Turbidity. | Color. |
| | | | | | | | | | | | | | | | | | | | | | | |
| January | 5,059 | 2,040 | 15 | 59.68 | 99.71 | 33 | 0 | 11 | 0 | 13.2 | 6.7 | 6.5 | .48 | .52 | 1.00 | 13 | 58 | 2.7 | 84,492,000 | 16 | 0 | 0 |
| February | 22,152 | 6,610 | 99 | 70.15 | 99.57 | 93 | 0 | 13 | 0 | 25.8 | 19.0 | 6.8 | .82 | .45 | 1.27 | 16 | 12 | 2.3 | 90,914,400 | 83 | 0 | 0 |
| March | 15,894 | 4,113 | 23 | 74.12 | 98.85 | 162 | 0 | 17 | 0 | 13.3 | 4.3 | 9.0 | .89 | .63 | 1.52 | 15 | 50 | 2.4 | 87,100,000 | 22 | 0 | 0 |
| April | 3,812 | 1,165 | 5 | 69.44 | 99.87 | 36 | 0 | 12 | 0 | 12.2 | 5.1 | 7.1 | .60 | .54 | 1.14 | 16 | 49 | 2.0 | 85,487,040 | 9 | 0 | 0 |
| May | 5,168 | 1,283 | 4 | 75.17 | 99.91 | 86 | 0 | 15 | 0 | 12.6 | 4.7 | 7.9 | .73 | .56 | 1.29 | 16 | 06 | 2.2 | 84,388,000 | 13 | 0 | 0 |
| June | 588 | 299 | 6 | 49.92 | 98.98 | 11 | 0 | 6 | 0 | 34.7 | 29.6 | 5.1 | .11 | .61 | .72 | 12 | 47 | 2.6 | 86,676,480 | 26 | 0 | 0 |
| July | 2,275 | 580 | 8 | 74.50 | 99.65 | 119 | 0 | 10 | 0 | 60.0 | 55.6 | 4.4 | .25 | .71 | .96 | 13 | 21 | 2.6 | 87,824,320 | 36 | 0 | 0 |
| August | 654 | 333 | 9 | 49.08 | 98.66 | 21 | 0 | 6 | 0 | 79.6 | 73.5 | 6.1 | .15 | .68 | .83 | 16 | 06 | 2.3 | 83,147,904 | 78 | 0 | 0 |
| September | 997 | 475 | 11 | 52.36 | 98.99 | 12 | 0 | 4 | 0 | 106.9 | 102.6 | 4.3 | .05 | .70 | .75 | 9 | 52 | 3.8 | 87,723,360 | 60 | 0 | 0 |
| October | 1,099 | 873 | 19 | 20.53 | 98.25 | 16 | 0 | 5 | 0 | 98.1 | 92.9 | 5.2 | .20 | .71 | .91 | 9 | 43 | 3.6 | 91,470,960 | 32 | 0 | 0 |
| November | 306 | 223 | 4 | 27.11 | 98.86 | 5 | 0 | 3 | 0 | 98.3 | 90.6 | 7.7 | .50 | .60 | 1.10 | 14 | 15 | 2.1 | 90,400,320 | 6 | 0 | 0 |
| December | 2,731 | 1,473 | 68 | 46.06 | 97.50 | 17 | 0 | 5 | 0 | 95.3 | 85.7 | 9.6 | .62 | .77 | 1.39 | 12 | 12 | 2.6 | 85,240,000 | 59 | 0 | 0 |
| Daily average for the year | 4,949 | 1,662 | 19 | 66.43 | 99.62 | 52 | 0 | 9 | 0 | 54.6 | 47.6 | 7.0 | .45 | .64 | 1.09 | 13 | 29 | 2.6 | 87,658,704 | 36 | 0 | 0 |

pass which may or may not be injurious to the human system. It is natural, therefore, that the question has been asked. Is it possible to destroy all the bacteria in the water by adding something in the water which will destroy the bacteria without injuring the water as far as its drinking properties are concerned? Experiments have been carried out for many years of applying different chemical forms of chlorine, both electrically and directly obtained to water; as well as attempting to impregnate water by intensified forms of oxygen, such as ozone, with the idea of disinfecting the water and rendering inert all properties of micro-organic character. While laboratory experiments have shown that it is possible to sterilise a water, absolute sterilisation has never been reached in practice. In dealing with large quantities of water, the difficulty has never been overcome, of reaching every particle of the water with the disinfectant. Further, in the case of water containing matters in suspension, it has been found impossible, in practice, to penetrate these matters so as to obtain absolute disinfection.

Disinfection or sterilisation may be feasible as an adjunct or accessory to filtration: but, as a method of purifying water, by itself, it is absolutely useless. For instance, if we could obtain a water entirely free from all suspended matter, and containing only organic matter in solution along with the presence of bacteria, there sterilisation might be effective. But no such water is ever placed before us to deal with, unless it has been first treated by efficient filtration. We, therefore, find that in all cases of so called sterilisation processes, filtration of the water is insisted upon as a primary necessity. We have a case illustrative of this point in Canada at the present time at Lindsay, Ont. At Lindsay there has been recently installed an ozone sterilising plant. The water is first treated by filtration, and then charged with the ozone gas. The filtration is only of a rough and ready character as it is expected that the ozone will do the real work. According to a recent analysis of the treated water, however, we find that the filters remove 67 per cent. of the bacteria, and that the ozone only removes a further 57 per cent. of bacteria from this partially clarified water. The total percentage removal of bacteria from the original water by the combined processes being only 87 per cent., or 8 per cent. below the standard required for mechanical filters.

In the above case, if the filtration had been of an efficient character to remove the whole of, or practically the whole of the suspended matter, the result might have been satisfactory, but too much was asked of ozone, and too little of filtration.

The fact of the matter is, that up to the present, no data exist which will allow of a pronouncement in favor of sterilisation as opposed to filtration. On the other hand, sterilisation may be a useful and efficient addition to filtration in certain cases, where the original organic impurities are so high as to leave an undrinkable water with a bacterial removal of even over 99 per cent.

It must be remembered, that, one of the chief reasons for filtering water will always be the removal of sediment which causes turbidity and choked mains. All the methods of sterilisation yet put forth, do not affect turbidity or matter in suspension, unless aided by filtration. It must be filtration first, and the best that can be done by filtration; then, if necessary, when all is filtered out that it is possible to filter, sterilisation may follow as a method of dealing with matter in solution or so minute that any filter cannot take cognisance of it.

Municipal Progress in Saskatchewan

The Legislature of Saskatchewan, at its recent session, devoted a good deal of time and attention to municipal matters, very wisely realizing the great value of laying the foundations of municipal government on the wisest basis in a new Province, where municipalities are spring up like mushrooms. One of the changes was to alter the title of the "Municipal Commissioner" to the "Minister of Municipal Affairs", and call the department, the "Department of Municipal Affairs". This change has also been carried out in the other departments, and the "Commissioners" become "Ministers". This is a wise step, for it seemed useless, and was certainly confusing, to have a different nomenclature to that in use in the other Provincial Governments; and involved explanations when speaking of "Ministers" and "Commissioners" to show that in some cases they were synonymous; while the growing fashion of having cities governed by Commissioners, made it even more obscure.

Deputy Minister Bayne has kindly furnished the following information about the more important changes which affect the "Department of Municipal Affairs".

The Financial Year has been made to correspond with the calendar year, in all the five classes of municipal organizations, cities, towns, villages, rural municipalities, and local improvement districts (for each of which there are separate Acts). Greater uniformity in these different bodies has been obtained, and the annual returns, interim statements, etc., are made similar.

Seventy-four new Rural Municipalities were organized during the past year; the elections for Reeve and six Councillors was held 13th December, and the first regular meeting will be held on 3rd January, at which a Secretary-Treasurer will be appointed.

One hundred and sixty small Local Improvement Districts were also organized on the same date, and the Department appointed, and sent notices and instructions to, nearly a thousand returning officers. In these Districts elections will also be held at the same date as the Rural Municipalities; and as their area and divisions are the same as the latter, they can easily be promoted into the higher form. At the same time three hundred and fifty-nine small Local Improvement Districts were disorganized.

The Legislature was very generous to the Rural Municipalities, for they voted \$60,000, and the Premier, in speaking in the House, stated that it was not the intention of the Government to withdraw their work or assistance from them.

It is worth noting, that there is no provision for granting any sums of money whatever to the small Local Improvement Districts, or to those communities that decide to hold back, and do not adopt the more advanced form of local self-government.

Legislation is to be passed permitting any municipality which takes power from the Hydro-Electric Commission to delay the payment of the sinking fund until the power business is paying its way, so that the only cost of this nature will be for the interest. This is a great concession, and will aid many municipalities where there is doubt as to the practical issue of taking power.

"The essential principle of property being to assure to all persons what they have produced by their labor and accumulated by their abstinence, this principle cannot apply to what is not the product of labor, the raw material of the earth."—John Stewart Mill.

Union of Nova Scotia Municipalities

OFFICERS FOR 1909-1910 :

President: A. E. McMahon, Esq., Warden, King's County.

Vice-President: W. A. Richardson, Esq., Mayor, Sydney.

Treasurer: F. W. W. Doane, Esq., C. E., City Engineer, Halifax.

Secretary: Arthur Roberts, Esq., Town Solicitor, Bridgewater.

Fourth Annual Convention

OFFICIAL REPORT.

(Concluded)

The President called for the next paper on

Municipal Assessment

Mayor Stewart, Bridgewater, N.S.

I have been slated, rather against my will, to say something at this meeting on the subject of assessment. I recognize now more fully than I did, more fully perhaps than those who asked me, the immensity of the subject. Of course, it is only the question of taxation — the question of raising funds for the government of the country; but the great subject which is exciting and interesting the old country to-day, the fiscal propositions which are advocated by Mr. Lloyd-George, are questions of assessment. The alternative scheme, which the followers of the Hon. Mr. Chamberlain are putting forward under the name of "Tariff Reform", is a question of assessment. All the different devices which our governments at Ottawa and Halifax follow for the purpose of raising money to carry on the government of the country are questions of assessment. For the most part these taxes are indirect and as such deceive not the elect, but the electors. It is, however, when we come down to municipal government that we come face to face with direct taxation and here the question of assessment is a live issue; and it is as members of municipal councils that we are here to-day to discuss the question.

I am not prepared to propound or elaborate any new scheme. As a matter of fact, I do not propose to make even any suggestions, but will leave them to come out in the discussion which will follow this paper. Volumes might be written on the subject, but I am not writing a book to read to you here to-day. I will, however, refer to what we have already on our statute books and call attention to some of the faults which appear to me in the practical working out of our present laws.

To begin with, our chapter on assessment provides that direct taxes and rates may be levied on *real property, personal property, income* and also *age*, providing it is an accompaniment of masculinity. Ladies of all age are exempt from head tax. Various reasons, some of them facetious, perhaps, may be given for this exemption on the part of the fair sex; and I am not one who is so wanting in chivalry as to deny this concession to them. In arguments with them, however, on the question of suffrage, it might be well to keep it in mind. In country municipalities I interpret the statute to provide a possible imposition of anywhere from thirty to sixty cents on all males over the age of twenty-one years for "municipal" and "poor" purposes; and in towns a minimum poll tax of two dollars on all between eighteen and sixty years of age (except firemen) with a provision that this may be increased to five dollars at the will of

the Council, *provided it is not imposed on those otherwise assessed.*

Now let us examine this for a moment. I do not object to the difference in the age limit in beginning this tax on town and country boys, for it is a fact that the opportunities for earning an independent dollar comes more readily to the boys who live in towns. But why the distinction on the other end? Do we who eke out our living in cities and towns dry up and become more decrepit at the age of sixty than the man who toils on the farm? Are the old men of the towns less able to pay a dollar or two for the maintenance of our institutions than those of the country? There may be reasons but I have not thought them out. Again, let your town council raise the poll tax to four or five dollars and you will soon find out how easily the law will be evaded. All that is necessary is for the poll tax payers to have themselves assessed for a small amount, sufficient only to obligate them for a nominal tax, and they have broken a law through your by-law.

Next, let us look for a moment at another division of the subject — that of *Income*. Income, the statute says, "means the annual profit, gain, wages, salary or emolument arising from any place, office, profession, trade, calling, employment, labor or occupation, and directly or indirectly received by any person, and includes the interest arising, and directly or indirectly received from money, securities, notes, mortgages, debentures, accounts, public stocks, or from other property." What assessor can take that section, and after reading it over long enough that he thinks he has caught the full sense of it, can set down the income properly assessable under it, or the monied men of any of our towns or municipalities? It is often said of small towns that everybody knows everybody else's business; but there is at least one exception, and that is the hiding place of the money of the man who wants to get ahead of the assessor.

How many women, with incomes sufficient to place them in the list of assessable persons under this section, are actually assessed in the province? Why should a country doctor, who is obliged to keep teams and a stock of surgical and medical supplies, all of which are taxed under other sections, be entitled to no more exemption on income than his more fortunate confrere in the larger towns and cities whose sole stock in trade, outside his brains, may be only a lead pencil with which to write prescriptions? Why is a lumber merchant, with a nominal assessment often on his timbered property, entitled to more consideration on income assessment than a town clerk or a minister? The whole income assessment, as it appears on the books of all the municipalities I have seen, is a jumble of guesses. No assessors, with whom I have spoken on the subject, pretend that it is fair. All they contend is that they have done the best they could with an impossible situation.

The *personal property* assessment, as it is usually made, is also more or less of a farce. A piano which costs five hundred dollars shrivels up into a jew's harp on the approach of an assessor. A horse which could be bought only with hundreds of dollars goes on the list for tens and laughs with his owner when Mr. Assessor has said "Good-bye". The more valuable the property the greater is its depreciation, and by the same proportion the poor man gets it in the neck as compared with the man of means.

The great burden of taxation, however, comes from the assessment of *real estate*, and it is in connection with this part of the subject that I will call to your notice the methods which are prescribed for making the assess-

ment. Every city and every town constitute in themselves separate revisal and separate assessment districts. Every rural municipality is divided into a number of assessment districts, and these are grouped in bunches and form a lesser number of revisal districts. Each assessment section has its own assessors, each revisal district its own revisors. The assessors are required "to ascertain by diligent inquiry and examination the names of all persons liable to be rated in their own districts, their ratable property and income, and the extent, amount and nature of the same." They are also required to subscribe to an oath to the effect that they have set down the *true actual cash value* of all such property and income; but there is a saving clause added which makes it dependent on their information and judgment.

Now if the judgment of all assessors was equally good or equally bad (it would make no difference which) and their intentions were all equally honest, and by some happy combination of circumstances they could hit on a common level of values, the whole question would be settled. But assessors are just as human as municipal councillors, to say nothing of town solicitors, and recognizing this, our wise law makers have introduced some correctors. They have required in the rural municipalities the appointment of a Board of Revision and Appeal whose duty it is to equalize the assessment between the several districts within the municipality and also to correct individual errors of the assessors in the separate sections. In the towns a different board does the same work in so far as it is required, for it is only a matter of adjusting individual errors.

Opportunity is afforded too for appeals from these bodies; and after His Honor of the County Court and His Worship the Mayor and his honorable associates in the Council have passed their final and infallible judgment, the rolls are tied up with cotton strings and become a matter of history.

Now if a property valuation can once run the gauntlet of all these courts, it is fairly safe from future serious harm. For future assessors unroll the musty tomes of their predecessors, and with proper respect for them and their endeavors, the book is largely rewritten without amendment. If a timbered property assessed at a few hundred dollars changes owners for a consideration of a few thousand, it is thought best not to disturb the property relations, more especially as many of our lumber kings consider themselves as benefactors. It is thought better to wait for another year or so. In the meantime the benefactor cuts the timber, pockets the profits and sells the land to a new settler. It is then classed perhaps as cleared land at a higher valuation. I have no concrete case in mind, but only give this as an illustration of the way our assessment regulations sometimes work out.

On the other hand, if assessors actually try to carry out the requirements of the Statute (more especially in the towns) they are obliged to penalize thrift and industry. If a property owner is a man of taste and takes a pride in improving the appearance of his home he knows that he runs the risk of wringing his own nose.

Then, too, the adjustment of the joint service expenditure between town and municipalities, which is made dependent on the assessed values of their respective properties, is a source of continual wrangling between these bodies. There is no machinery for levelling these values. Usually on account of investment in utilities of one kind and another or on account of loans required for general public improvements, the towns have an object in trying to keep their valuation up to a high level, and the percentage of difference between actual

and assessed values is often much less in the towns than in the rural districts. Provision is made of course for adjusting the measure of respective expenditure when the arbitration committee fail to agree, but that is only for the time. The same conditions are run up against the next year and the same old work of crowding goes on.

I offer no remedy. I have hurriedly written these few words to introduce the subject. I know that as I turn the question over to President Hood and Warden MacMahon, whose names are associated with mine on the programme, and to the rest of you, I am placing it in excellent hands.

Warden McMahon, Kings, moved a vote of thanks and stated that in his opinion the plan of assessment was right, but the method by which it was worked was wrong. People coming into the Province to live, looked up the assessment rolls to ascertain the value of property, and were naturally surprised to find that while a farmer was assessed for say \$2,000, he wanted \$8,000 or \$10,000 for the farm. Assessment rolls each year should show the change of valuation in the district.

Municipal Clerk Dimock, West Hants, seconded the motion. He favored the idea of a general assessor with local aids. The present plan simply meant that assessors were afraid to increase the valuations as it would not be general over the County, and they did not wish their district to be higher than others.

Warden Bishop stated that Halifax County Districts had fallen off nearly \$7,000. He also favored a general assessor.

Mayor Richardson, Sydney, said the system was bad; it is simply a question as to who can get the lowest valuation. Put assessors on the stand, and they would be forced to admit that they did not carry out the law. He cited a case in Cape Breton County where in twenty districts there was not a change in the total of \$5,000. The only principle seemed to be to assess for \$150 so as to get a vote.

Stipendiary McDougall, Halifax, said the assessors could not do their duty because if they did, they would not be able to live in the locality.

City Solicitor Findlay McDonald, Sydney, explained that a commission had been appointed in Cape Breton to find a standard of assessment as regards joint expenditures. His experience was that the Act was good, but badly worked.

The motion was then declared carried.

A letter was read by the Secretary from Town Clerk W. D. Lawrence, Inverness, suggesting the collection of poll tax through employers. On motion it was referred to the incoming Executive for consideration and report.

Town Solicitor Roberts, Bridgewater, and Mayor Richardson, Sydney, moved the following resolution:—

"That this Convention is of the opinion that incorporated Towns and county municipalities should be given full control over the taxation and licensing of all kinds of hawkers and peddlers within the respective limits, and that there should be no special or exceptional legislation in this respect." Carried.

Mr. Roberts, Bridgewater, brought up the matter of the power of towns to pass by-laws to impose a license on peddlers (other than producers) of fish, meat, farm produce, etc., Halifax, Sydney, Amherst, Springhill, Parrsboro and rural municipalities have that power now. All towns should have the same power. Mr. Roberts asked that the request of the Town of Bridgewater that the same power should be given to them and all other Towns, be sent to the Resolutions Committee.

Dr. Perrin, Yarmouth, said Yarmouth was suffering too, and in that connection referred to sale of bad meat, etc., and urged the need of inspection.

Deputy Warden Chambers, West Hants, said there might be danger of boycotting the Towns.

Mr. Roberts pointed out that producers were not to be obliged to take out licenses.

Mayor Murray, Truro, stated that Truro made such a by-law and enforced it, but it appears now that it was not legal.

President Hood explained more fully the intention of the proposal.

Mayor Stewart, Bridgewater, claimed that if this matter were thoroughly understood there would be no danger of friction.

Mr. Dimock, West Hants, feared retaliation from the municipality, by taxing the Town.

Stipendiary McDougall, Halifax, reminded Mr. Dimock that the rural municipality has the power now provided. It does not affect the produce of the sea or farm.

Mayor Kelly, Yarmouth, stated that the difficulty would be in discriminating in the case of a man who produced part of what he sold and bought the rest. He thought all towns should have the same right, but did not want to encourage friction. Passed.

Mayor Stewart then moved that the following be appointed a nominating committee to report a list of officers and committee for ensuing year:—

Auditor: F. H. Bell, Esq., City Solicitor, Halifax.

EXECUTIVE COMMITTEE :

J. A. Chisholm, Esq., K. C., Mayor, Halifax; T. S. Rogers, Esq., Town Solicitor, Amherst; Willard Kelly, Esq., Mayor, Yarmouth; Finlay McDonald, Esq., City Solicitor, Sydney; John McDougall, Esq., County Stipendiary, Halifax; W. K. Murray, Esq., Mayor, Truro; W. K. Dimock, Esq., Municipal Clerk, West Hants.

Warden Bishop, Halifax Municipality, moved, seconded by Mr. T. S. Rogers, Amherst, that the report be adopted and the Secretary instructed to cast one ballot.

Carried.

On motion of Warden McMahon it was decided that the invitation of the Municipality of Kings be accepted and that Kentville be the next place of meeting.

A vote of thanks was put and tendered to President Hood for his services.

Mr. Arthur Roberts, Bridgewater, moved, seconded by Alderman Martin, Halifax, that Mr. F. W. W. Doane be appointed delegate to represent this Union at next year's Convention of the Union of Canadian Municipalities.

A vote of thanks was put and tendered Mayor Kelly and citizens of Yarmouth for the hospitality and courtesies extended.

The Mayor replied in his usual happy manner.



UNION OF NOVA SCOTIA MUNICIPALITIES

Messrs. T. S. Rogers, Finlay McDonald, P. F. Martin, Willard Kelly, William Bishop, and F. J. Mitchell. Committee retired and subsequently reported as follows:—

President: A. E. McMahon, Esq., Warden, King's County.

Vice-President: W. A. Richardson, Esq., Mayor, Sydney.

Treasurer: F. W. W. Doane, Esq., C. E., City Engineer, Halifax.

Secretary: Arthur Roberts, Esq., Town Solicitor, Bridgewater.

The Convention then adjourned.

During the afternoon the delegates were given a delightful automobile ride through Yarmouth and its suburbs, the beautiful grounds of Mr. Kaie and the Cemetery especially exciting the admiration of the visitors.

Later, as guests of the town of Yarmouth, a sail on the Harbor was enjoyed. The party landed at "Markland", where the inner man had been well provided for by the hospitable western hosts. A return trip by moonlight brought to a close one of the most successful conventions held by the Union.



TELEPHONE NEWS



OFFICIAL INFORMATION
OF THE
CANADIAN INDEPENDENT TELEPHONE ASSOCIATION
& C, & C, & C,

A TRIP TO WATERFORD

Prospective telephone buyers can make no better investment than to visit Waterford.

1st. You will visit the mammoth plant of the Dominion Telephone Manufacturing Co. Ltd. and see how we manufacture complete telephones and switchboards from the raw material, see how we assemble them, see what a rigid test we give every part, see how we pack them ready for shipment.

2ND. You will visit a complete and up-to-the-second telephone exchange using the same kind of equipment manufactured by the Dominion Telephone Mfg. Co. Ltd.

3RD. You will be shown a modern rural telephone system, using the same telephones and equipment manufactured by the Dominion Telephone Mfg. Co. Ltd.

4TH. You will be shown the books of the Telephone Exchange which will show you how a ten per cent dividend is paid every year.

SEEING IS BELIEVING

If you want telephone apparatus that will pay you dividends,

If you want telephone apparatus that is manufactured in Canada,

If you want to avoid paying duty on parts that are manufactured outside of Canada,

If you want to trade with Canadians,

If you want the best telephone apparatus on earth and have it proven to YOU to YOUR satisfaction by actually seeing it made and in operation in the same town,

COME TO WATERFORD

We claim to be the only bona fide Independent Telephone Manufacturing Company in Canada that manufactures ALL of its apparatus and can prove it to YOUR satisfaction, notwithstanding the untruthful statements of disgruntled assemblers traveling under the guise of manufacturers. Ask the so called Independent manufacturers in Toronto what make of transmitters, receivers, generators, etc., etc., etc., they use on their apparatus and where they are made.

Dominion Telephone Mfg. Co., Ltd.

WATERFORD, Ontario.

The only Independent Manufacturers in Canada
manufacturing ALL their apparatus from the raw material.

H.W.B.

Canadian Independent Telephone Association



OFFICERS 1909-1910 :

President, W. Doan, M. D., Harrietsville, Ont.
 Vice-President, C. Skinner, Sherbrooke, Que.
 Sec.-Treas., Francis Dagger, 21, Richmond St. West, Toronto, Ont.

EXECUTIVE COMMITTEE:

Dr. Demers, Levis, Que.; F. Page Wilson, Toronto, Ont.; T. W. Ralph, North Augusta, Ont.; G. W. Jones, Clark, Ont.; A. Hoover, Green River, Ont.; T. L. Squires, Waterford, Ont.; M. House, Bridgeburg, Ont.; Levi Moyer, Beamsville, Ont.; T. R. Maybury, M. L. A., Ingersoll, Ont.

RURAL COMPANIES PLEASE NOTE

The Bell Telephone Company has declared that it will not entertain any proposition for inter-change of service which leaves the connecting company free to build competing lines. This means that when a company accepts a "Bell" connection it becomes an agent of the Bell Telephone Company and is no longer independent so far as its freedom of action is concerned. Even if your subscribers receive a temporary benefit, what about the people in your surrounding towns where the possibility of competition has been eliminated by the executing of an agreement in which you give the "Bell" an absolute monopoly? The evil, however, does not stop there, for when the "Bell" has succeeded in tying the hands of all the small companies, and has parcelled out the whole country to suit its own convenience, what do you think will happen? The country will once more be in the powerful grasp of monopoly and conditions will again be what they were before the opening of the Dominion Telephone Inquiry of 1905, only very much worse, for the whole territory will be covered with small companies all subservient to the monopoly. To-day you have a voice in the making of agreements with the "Bell". Then the terms will be dictated to you and you will have no alternative but to submit. It is the old story of the "spider and the fly".

BEWARE

The American Telephone & Telegraph Company, which, according to the published statements of its financial agents, controls the "Bell" system in Canada, has acquired control of the telegraph business in the United States.

Watch developments in this Dominion, and beware of making the "Bell" monopoly in Canada more powerful than it is to-day.

Establish your own telephone service, control it yourselves, and retain the profits which your rentals provide.

Why purchase apparatus from concerns in the control of the "Bell" monopoly, when you can obtain the best and most modern equipment from independent manufacturers who have fought your battles and made rural telephone service a possibility.

Select Committee on Telephone Systems, Minute of Evidence.

Page 552

By Mr. Chrysler :—

Question.—So that the Bell Telephone Company, except the Directors' Shares, hold all the issued shares of the Northern Electric and Manufacturing Company?

Answer.—(By C. F. Sise) They do.

Question.—Who are the Directors of the Northern Electric and Manufacturing Company?

Answer.—They are practically the Directors of the Bell Telephone Company.

The Canadian Independent Telephone Association exists for the purpose of removing the evils of monopoly in telephones, and assisting the people to secure an unrestricted service by the establishment of systems under local ownership and control.

If you are interested in the organization of a local, municipal, or rural telephone system, and require advice or assistance, write to

FRANCIS DAGGER,

Secretary Treasurer,

Executive Offices, 21 Richmond Street West, TORONTO

Is the Telephone a Natural Monopoly?

Francis Dagger

Toronto

That the telephone is a natural monopoly, is an oft-repeated statement. The statement has always, however, been made by those who, actuated by personal interests, did not wish to invite competition. In other words, this doctrine has always been preached by the friends of monopoly, as a plausible reason with which to console a long suffering people, who for so many years were the victims of an inefficient telephone service at exorbitant rates.

I wish you to note that the assertions in support of the contention that the telephone is a natural monopoly, is the evidence of interested parties, and therefore should be treated accordingly. On the other hand it may be argued that those who advocate the theory that the telephone is *not* a natural monopoly, are desirous of maintaining competitive telephone systems, and consequently their evidence is only of a value equal to that of their opponents. I think you will also agree with me that if you were operating a telephone plant in some town where you were fortunate enough to be in sole possession, you would incline to the belief that the telephone should be considered a natural monopoly so far as your territory was concerned.

My subject, however, is too important a one to be decided by the views of those who are pecuniarily interested in the success of monopoly or competition. The telephone is one of the greatest public benefactors the world has ever known. By its invention science conferred upon humanity a sixth sense (if I may so use the term) viz: the power of conversing with countless thousands of our distant and unseen fellow beings, at times, it may be, when this was the last available recourse which stood between the loss of property, fortune or often of life itself.

By its contribution to the needs of humanity the telephone has proved its claim to rank as one of the most necessary of those utilities which inventive genius has placed at the service of man.

There are hundreds of thousands of citizens right here in Chicago and millions of people on the North American Continent not enjoying the benefits of the telephone to-day, who would take it if proper methods were adopted to furnish the service. It is in the consideration of these methods that the question arises, which forms the title of my paper.

If the telephone is a natural monopoly I must say that nature has been very unkind to it, for a more stunted production it would be impossible to imagine, than that presented by the telephone industry when it emerged from twenty years' monopolistic control. Just think of it, from twenty years of monopoly in the United States and Canada, it emerged a sickly plant some twelve inches high. To-day after fourteen years of healthy competition it is a sturdy tree towering twenty-eight feet above the ground. In other words twenty years of monopoly placed less than a quarter of a million telephones at the service of the people, while fourteen years of competition has extended the use of this utility to over seven million subscribers. Judged, therefore, by the growth of business there is no doubt that the verdict of the people is emphatically on the side of competition.

It is further a significant fact that in the past no company has been able to retain a monopoly in the telephone business without the protection of the State, Province, or Municipality. Wherever this protection has been withdrawn the result has been the establish-

ment of a competitive telephone system. In some parts of Canada, for instance, the one obstacle to the establishment of an independent service in the principal towns and cities, has been the granting of five years' exclusive agreements to the Bell Telephone Company, or the reluctance of municipal councils to grant franchises upon equitable terms to independent companies. In no case can it be truthfully stated that a Bell Company is enjoying a monopoly anywhere on this continent because the natural conditions surrounding its business are such as to render competition impracticable or undesirable. On the contrary the "Bell" system remains a monopoly just so long as the State, Province, or municipality keeps the door closed against competition. In other words, the monopoly is kept alive by artificial means, and therefore cannot be a natural one.

Almost the only argument which has been used in support of the theory that the telephone is a natural monopoly, is the assertion that competition means that the majority of people must have two telephones, thereby entailing the payment of two rentals, which increases the cost of service to the user. This argument has been amply refuted by a recent statement showing conditions existing in eighteen cities in Illinois, Iowa, Indiana, Michigan, and Ohio, which records that out of 44,293 "Independent" and 33,305 "Bell" stations, only 4,304 business and 1,662 residence subscribers have both telephones. That is only 5,966 subscribers out of 77,598 duplicate the service. Less than eight per cent.

In Iowa, out of a total of 168,148 "Bell" and "Independent" subscribers there are only 5,426 duplications, or 3.2 per cent.

A careful analysis of telephone figures in Cleveland, Dayton, and Toledo, Ohio; Indianapolis, Ind.; Kansas City, Kan.; and Louisville, Ky., shows an average duplication of only twelve per cent. That is twelve out of each hundred subscribers take both "Bell" and "Independent" telephones, while the remaining 88 get all the service they require by renting one telephone. It is further conceivable that six out of each twelve subscribers who have now both services, would still require two telephones to handle their business, if there were only one system in each of the cities named. These facts prove beyond doubt that telephone competition means "The greatest good to the greatest number" in that it secures to at least ninety per cent. of telephone users, lower rates and an improved service.

In regard to the Dominion of Canada before the advent of the Independent Telephone movement in 1905, the policy of the monopoly was to select the large and more densely populated centres where the largest profits could be earned. The smaller towns and villages were absolutely neglected, or at least had to be content with a toll office. The request of the farmer for service invariably met with either a curt refusal, or a demand for terms so exorbitant as to be absolutely prohibitive. Hundreds of cases might be quoted illustrating the arrogant treatment which the farmer received from the "Bell" monopoly. Every conceivable effort was made to stifle the movement for rural telephones at its inception. Time and again farmers have established a service which this monopoly had refused to furnish, only to find their lines paralleled and their capital placed in jeopardy by the threats, intimidation, and other forms of persecution of "Bell" agents. In the early days, before rural telephone systems became so popular as they are to-day, small companies in Quebec and Ontario have been forced into bankruptcy by the unscrupulous methods of "Bell" agents, and in this way thousands of dollars have been lost by farmers and others. In some cases men have

been ruined by the tactics of these agents in their efforts to discourage rural telephones in Canada.

Twenty-five years "Bell" policy in Canada, from 1880 to 1905, resulted in the placing of 90,000 telephones, less than 67,000 of which were in the territory of the Bell Telephone Company of Canada, the balance being distributed among the Maritime Provinces, British Columbia, and a few small independent companies. To-day there are approximately 200,000 telephones in the Dominion, of which the Bell claim about 120,000.

I might take up your time indefinitely with examples furnishing convincing proof that in no part of the world have the people enjoyed the benefit of the telephone service to the same extent under monopoly as they have under competition, but I do not wish to exceed the limits of your patience.

As however, it is sometimes stated that conditions upon this side of the Atlantic differ widely from those in the Old World, I would like to call your attention to one very convincing proof of the benefit of competition under European conditions. I mean Stockholm, Sweden, which is to-day the best telephoned city in Europe, if not in the whole world. In 1880 the International Bell Telephone Company established an exchange in Stockholm. Three years later an independent company was organized by local capitalists, and in one year this company had 2,300 subscribers against 900 of the "Bell". The Government deciding to monopolize the telephone business purchased all the "Bell" exchanges outside Stockholm and established a third competing system in Stockholm, believing no doubt that with its ownership of the outside systems and the long distance lines that the city companies would soon be out of business. This three cornered fight continued for a few years, when the "Bell" decided to sell out to the local independent company which is still operating to-day in competition with the Government. In October this year the independent company had 52,500 subscribers, while the Government has about 25,000, a total of 78,500 subscribers, or 230 for each 1,000 inhabitants of Stockholm. Need we go further for any proof of the fact that telephone competition will do as much for the Old World as it has for the people of the United States, or in refutation of the claim that the telephone is a natural monopoly.

It is further significant that in Great Britain monopoly was 21 years building up a system of 7,000 telephones in Glasgow, while four years' competition increased this number to 30,000; and proportionately similar results have followed competition in England wherever the Government permitted it to exist. The people of Great Britain are exceedingly unfortunate in the fact that its Government has never allowed competition in telephones such as we enjoy upon this side of the Atlantic.

To return however to conditions in the United States, here are a few results of competition in some of the cities, and I would call attention to the first figures in each case which are the product of twenty years monopoly.

Competition increased the number of telephones in St. Louis from 3,500 to 70,000 in 11 years;

Cleveland, from 5,500 to 55,000 in 10 years;

St. Paul, Minneapolis, from 4,800 to 60,000 in 7 years;

Los Angeles, from 13,000 to 68,000 in 7 years;

Indianapolis, from 2,000 to 30,000 in 10 years;

Toledo, Ohio, from 2,000 to 22,000 in 8 years.

At the present time, as the result of competition:—

Toledo, Ohio, has 126 telephones per 1,000 inhabitants.
St. Paul, Minn., has 127 telephones per 1,000 inhabitants.

Indianapolis, Ind., has 131 telephones per 1,000 inhabitants.

Portland, Oregon, has 131 telephones per 1,000 inhabitants.

Kansas City, Kan., has 132 telephones per 1,000 inhabitants.

Grand Rapids, Mich., has 146 telephones per 1,000 inhabitants.

Los Angeles, Cal., has 215 telephones per 1,000 inhabitants.

In the light of these figures need I go further than Chicago for an answer to the question "is the telephone a natural monopoly?" In Chicago to-day there are 68 telephones to each 1,000 inhabitants, as a result of over thirty years monopoly, or approximately only 170,000. If Chicago was telephoned to the same extent as Stockholm, Sweden, its system would comprise 575,000 telephones; if to that of Los Angeles, 537,500. I leave you, gentlemen, to solve the problem of who is going to furnish the 400,000 telephones necessary to enable this city to supplement its reputation of being the largest telephone manufacturing centre in the world with the proud boast that it is also the best telephoned city on this continent.

In conclusion I might call your attention to the benefits which telephone competition has brought to every community in the enormously increased capital expended in the employment of labor, in money saved as a result of the facilities afforded to thousands of communities where monopoly restricted the use of the telephone, and many other advantages which have accompanied the independent movement in its triumphal march of the past fourteen years. Monopoly has always restricted, and will for all time restrict, the use of the telephone to a few, while competition has not only improved and cheapened the service, but has placed it within reach of innumerable thousands who otherwise would have been deprived of its benefits.

Natural monopoly does not exist in fact, for nature and monopoly are the direct antithesis of each other.

Therein, lies the secret of the success of the independent telephone movement, the tide of which no tactics or conspiracy of its enemies, and not even the treachery of its erstwhile friends, will avail to stem.

To Meet the Combine

To offset the combine of the American Telephone and Telegraph Co. with the Western Union Telegraph Co., it is stated that a working agreement has been made between the Postal Telegraph Co. and the Independent Telephone Companies of the North Western States, and that this arrangement may be extended all over the States.

In the United States, there are 40,000,000 telephone and telegraph poles, valued at \$200,000,000.

The net earnings of the American Telephone and Telegraph Co., last year, were \$19,419,413, which is \$1,522,256 more than for the previous year.

Mr. Jas. Pender told the Board of Trade, at St. John, N. B., that while in Australia, he found that the Government owned telephones cost from £4 to £5 (20 to \$25) a year.

The National Independent Telephone Association

The International Telephone Association held its final Convention at Chicago, Ill., last month, as it died then, and is succeeded by the National Independent Telephone Association.

As among its objects are "to improve telephone service and facilities in the United States", and to secure "to the people of the United States" the benefits of telephone competition, it has been narrowed from an "International" to a purely "National" organization.

So Independent Companies in Canada must look to the Canadian Association for that mutual help which is absolutely necessary, though we feel confident that the U. S. Association will exhibit the most kindly and fraternal feelings, and will not hesitate to put those feelings into active operation should occasion arise. Further, we are sure that every one in Canada who sympathises with Independent Telephony will sincerely wish increased prosperity and success to the altered Association across the line.

The telephone situation in Canada is so entirely different, that it is only reasonable that this departure should have been made. While in the United States there is only the Bell and the Independent Companies, here in Canada we have not only these two, but also Government and Municipal ownership, and Government support of Independent Companies; and — even more valuable still — we have a Railway Commission whose authority extends to telephone systems, and which has been the most potent factor in securing justice for the public.

The beneficent situation in Canada is owing very largely to the splendid fight for public rights put up by the Union of Canadian Municipalities. The fact that the Bell Company to-day cannot enter upon any road and street in the Dominion without the consent of the municipality, in spite of the blanket powers of its charter, is a victory for the U. C. M. that is not fully understood or valued.

In his remarks, Secretary J. B. Ware referred to the statistics compiled by the U. S. Government up to the end of last year, which show a total of 22,971 separate companies of which 35 are Bell, and the balance Independent, but pointed out that this did not give the real number, as enquiry in different states had shown many companies had not sent in any returns. For this reason it is fair to think that the statement that there are more Bell telephones than Independent ones, may not be correct, but that the opposite is really the case. For instance, in the six central States there are 80,000 more exclusively Independent phones, than Bell added to the Independent that connect with the Bell, and this is the more remarkable as Chicago, Milwaukee and Cincinnati have no Independent phones. A list presented shows that of a total of 6,118,578 phones in the United States, not more than 2,149,635 were absolutely independent of the Bell.

Telephone Merger

A despatch from Washington, D. C., states that the Department of Justice is making full investigation into the combination of the American Telephone and Telegraph Co. with the Western Union Telegraph Co. It is stated that records on file in the Department show the existence of a monster trust operating in conjunction with the General Electric Co. and the Westinghouse Electric Co. Further that these companies form part of the gigantic "water-power trust".

About a third of the Kellogg sales force recently spent a day inspecting the lately finished addition to the cabinet-making factory. This new structure is a handsome brick building, 60 by 200 feet, well lighted and completely equipped.

Besides the immense new glue machine and apparatus for handling the rough lumber there are 22 separate machines for the producing of telephone cabinet parts. Some of the machines are lathes; belted sanders; planing machines; the glue machines; and receiving room.

The great quantity of rough lumber, partly finished stock and assembled boxes that are in the factory at this time is evidence of the amount of work going through the factory daily.

The majority of the machine equipment is individual drive, and some of the more important apparatus is a belt sander, drill press, band-saw, dovetail machine, box sletter, planer, cabinet surfacer, under-cut planer, exhaust fans, glue machine, 4-sided moulder, buzz planer and swing saws; also spindle shapers, drill presses, carver and moulder, cut-off saw.

Among those present on the inspection tour were: Messrs. L. D. Kellogg, J. B. Edwards, J. C. Kelsey, C. S. Winston, W. R. Hind, A. S. Hallstrom, A. D. Carter, G. A. Joy, G. H. Crandall, H. N. Faris, L. R. Foote, F. C. King, E. G. Lawrence, O. Morsman, J. C. Murray, R. W. Pillars, A. E. Weber and W. R. Boze.

Another Quick Switchboard Order

A fire at Bass, Michigan, destroyed the switchboard of the Bass Telephone Company. The Kellogg Switchboard & Supply Co., Chicago, Ill., received the order at 10.35 Friday, November 26th, and shipped the board complete on the first train, Saturday, for Bass, which left at 10.30 a. m. Prompt service and shipments are important features of the Kellogg Switchboard & Supply Co.'s sales service for operating companies.

Patronize "Made in Canada" Goods

The Canada Wire Goods Mfg. Co. are illustrating in this month's issue one of their standard double Cells, lattice steel bar construction. Although this concern has only been specializing in jail and prison construction for some two years, they have developed a very extensive department covering all classes of prison work. Their Cells are well and favorably known from coast to coast. Their patented instantaneous spring lock and lever locking devices are meeting with great favor and have been largely instrumental in securing them some very nice business. They are in a position to quote on any class of prison construction, viz. solid plate, round bar lattice and Hexagon steel bar construction. Any business intrusted to this Firm will be carried out in a thorough workmanship manner.

In addition to prison construction, they are manufacturing all grades of Wire Cloth in steel, brass and copper. Very recently they equipped an Eastern Municipality with a number of special copper screens for water-works filtering purposes. They are well equipped to handle business of this nature, also Bank and Office Railings, Wire Guards, Gravel Screening, and in fact all lines of General Wire and Iron Work of every description. We bespeak for the Canada Wire Goods Mfg. Co. the support of all Canadian Municipalities interested in their lines of manufacture.

Abstract of Telephone Patents

granted in the United States last month

Prepared for *The Canadian Municipal Journal* by

Edward E. Clement,

Telephone Patent Expert, Washington, D.C.

Art of Nullifying Inductive Disturbances. — **Athearn.** — Signals are transmitted over a group of lines for the purpose of inducing electromotive forces in through lines of the system to neutralize inductive effects in all the lines due to an external source. Assigned to American Telephone & Telegraph Co., New York. — 940,654.

Electrical Conducting System. — **Athearn.** — This is the system for practicing the previous method. It includes the group of lines and inductive windings connected on one side to the lines of one group and on the other to lines of a second group, with means for preserving electrical continuity of the primary group independently of the associated lines. Assigned to American Telephone and Telegraph Co., New York. — 940,655.

System for Nullifying Inductive Disturbances. — **Barrett.** — This system is related to those previously mentioned, also presenting separate groups of conductors, a transformer connected on the two sides of the respective groups, primary ground connections, and a condenser and retardation coil in each ground. Assigned to American Telephone and Telegraph Co., New York. — 940,658.

Telephone Key and Means for Actuating the same. — **Christensen.** — A semi-automatic exchange system. Each operator's connecting circuit has a key with means for retaining the same in the position to which it is moved, and means common to all connecting circuits whereby the operator may effect the release of all the keys. Assigned to American Telephone and Telegraph Co., Boston, Mass. — 940,673.

Telephone System. — **Hulfish.** — Multiple answering terminals cooperating with ordinary cord circuits at different positions, while a line selector at each position picks up and identifies calling lines for that position to the exclusion of others. Assigned to McMeen & Miller, Chicago. — 940,693.

Telephone System. — **Stone.** — The inventor seeks to eliminate side tones, his circuit including an electro-responsive device and one of the windings of a transformer, the transmitting circuit including the other winding of the transformer, and a signalling device and source of energy in the transmitting circuit with means for regulating the mutual effect of the windings. Unassigned. — 940,746.

Telephone System. — **Wallace.** — Metallic filament lamps are placed directly in the lines at central. Assigned to Vote-Berger Co., La Crosse, Wis. — 940,994.

Telephone Attachment. — **Mitchell.** — A simple cam switch is adapted to cut a divided line over one way of the other in a well known manner. Assigned one-fourth to Hammed B. Hurt and one-fourth to James W. McCrary, Franklin, Tex. — 941,086.

Telephone System for Auditoriums. — **Turner.** — Transmitters are distributed through an auditorium at fixed points, a number of receivers are connected up together, and a switching station located so that the operator can connect any one or more of the transmitters with the receivers. Unassigned — 941,114.

Antiseptic Mouthpiece for Telephones. — **Rowlands.** — Mouth-piece lining is of absorbent material carrying a hygroscopic substance, has a jacket of sheet metal, and an annular cover fitting over the jacket and retaining the lining. Assigned one-half to Walter S. Wood, Schenectady, N. Y. — 941,173.

Telephone Cabinet. — **Oxford.** — In this cabinet the body is hung on hooks on the backboard, and a hinged door is employed in addition. Unassigned. — 941,336.

Telephone System. — **Webster.** — A plurality of relays for each line respond to currents of different strengths so as to light lamps on different divisions of the switchboard. Each subscriber has grounding buttons with different resistances to opposite sides of line. Assigned to Kellogg Switchboard & Supply Co., Chicago, Ill. — 941,666.

Telephone Line Selective Switch Device. — **Swanson.** — Extension lines are connected through main exchange lines in this system by automatic means at the substation, comprising a relay responsive to main battery and operator's keys at central and repeating winding for ringing in. Assigned one-fourth to T. F. Robinson, St. Paul, Minn. — 941,743.

Desk Telephone. — **Corwin and Bals.** — In this desk set switch springs, coil and terminal rack are in the base, the inner shell of which when removed carries with it the vertical members housed in the standard. Assigned to Corwin Telephone Manufacturing Co., Chicago, Ill. — 941,762.

Bank of Locking Switch Keys. — **Corwin and Bals.** — Interlocking keys in a row with notched stems cooperating with pins on a sliding bar. Some key will switch after interlocking the others and at least one does so before interlocking. Assigned to Corwin Telephone Manufacturing Co., Chicago, Ill. — 941,763.

Telephone Exchange System. — **Zahm.** — Bridged common battery automatic exchange circuit. Apparatus of Strowger type with battery put on calling line through a differential release relay and on called line through a pair of controlling relays which cut off the differential relay if called subscriber hangs up first, leaving ordinary release relays in circuit. Assigned one-fourth to Edward E. Clement, Washington, D. C. — 941,839.

Harmonic Signaling System. — **Manson.** — In this selective ringing system pole changers supplied from an auxiliary battery are bridged across the main battery with a retardation coil. Assigned to The Dean Electric Co., Elyria, Ohio. — 942,091.

Mechanical Code Signalling Device. — **Meissner.** — In this code device a plug is inserted and a magneto crank turned when a perforated plate passes over the plug tip, making and breaking the circuit, the plug being automatically locked and similarly released. Unassigned. — 942,334.

Portable Telephone. — **Mulot.** — Portable set with a plug fitting sockets at a number of stations on a common line. — Unassigned.

Signaling Apparatus for Telephone Systems. — **Welty.** — In this selective 4-party line system biased polarized ringers are employed in combination with condensers connected in series, whereby the ringers may be operated by either the charge or discharge of the condensers, and the windings of the ringers being arranged so that the magnetic fluxes will permit only one ringer to respond to a particular current or combination of currents. Unassigned. — 942,763.

Method of, and Apparatus for, Repeating Telephone Currents. — **Campbell.** — According to this method a series of condensers receive the charges in turn from the incoming line and are then mechanically separated and caused to discharge in turn in the outgoing line, the operation being of course continuous. Unassigned. — 942,885.

Apparatus for Receiving Submarine Sounds. — **Garrett & Lucas.** — This is a scheme for receiving vibrations transmitted through a body of water to the hull of a vessel. Carbon transmitters applied to the hull are liable to changes in sensitiveness, and the present inventors substitute a transmitter comprising a nickel rod surrounded by primary and secondary coils, a receiver being connected interchangeably through a double-throw switch with similar coils on either port or starboard bow so as to determine direction in a well understood manner. A weight is placed on the end of each nickel rod and the operation of course depends upon the property of the material by which changes of stress produce corresponding changes in magnetization which are communicated to the receiver coil. Unassigned. — 942,897.

Telephone Receiver Support. — **Mogridge.** — The receiver is carried on an arm formed up from a metal strip with a calming ring attaching it to the transmitter head. Unassigned. — 943,033.

Telephone Call Register System. — **Kibbe.** — In this scheme a register is employed common to a number of cords, and on one side is connected to one of each of the cord conductors and through exterior contacts, while a contact member forms the terminal of the other side which is adapted to be engaged by said exterior contacts of the cords. Unassigned. — 943,081.

Selective Signaling Apparatus. — **Leich.** — Different frequencies are employed in this scheme, the ringing apparatus being in two classes, ringers of one class tuned to respond to definite frequencies, those of the other class nontuned, but provided with series impedance to limit their operation to frequencies other than those for which the ringers of the first class are tuned. Assigned one-third to J. G. Ihmsen and one-third to Max W. Zabel, Chicago, Ill. — 943,115.

Mouthpiece for Telephone Transmitters. — **Jamieson.** — This is essentially an open ended funnel connected to the transmitter through its side by an elbow coupling. Unassigned. — 943,149.

Illuminated Telephone Dial. — **Hallock.** — A mortise in the support back of the dial receives a small incandescent lamp, from which the dial has a slot in register with the mortise covered with a translucent indicator disc. Unassigned. — 943,305.

Sanitary Telephone Transmitter. — **Calcutt.** — A main diaphragm is covered by an auxiliary diaphragm, and a lid is pivoted over this carrying an antiseptic pad, which would be wiped across the auxiliary diaphragm so as to clean it. Unassigned. — 943,386.

BANK OF MONTREAL

The annual report of the Bank of Montreal, for the year ended October 30th last is as follows :

| | |
|---|----------------|
| Balance of Profit and Loss Account, 31st October 1908 | \$ 217,628.56 |
| Paid for the year ended 30th October, 1909, after deducting charges of management, and making full provision for all bad and doubtful debts | 1,826,167.74 |
| | \$2,043,796.30 |
| Quarterly Dividend, 2½ per cent., paid 1st March, 1909 | \$360,000.00 |
| Quarterly Dividend, 2½ per cent., paid 1st June, 1909 | 360,000.00 |
| Quarterly Dividend, 2½ per cent., paid 1st Sept., 1909 | 360,000.00 |
| Quarterly Dividend, 2½ per cent., payable 1st Dec., 1909 | 360,000.00 |
| | \$1,440,000.00 |
| Amount credited to Rest account | |
| Balance of Profit and Loss carried forward | \$603,796.30 |

LIABILITIES

| | | |
|--|-----------------|------------------|
| Capital Stock | | \$14,400,000.00 |
| Rest | \$12,000,000.00 | |
| Balance of Profits carried forward | 603,796.30 | |
| | \$12,603,796.30 | |
| Unclaimed Dividends | 2,580.51 | |
| Quarterly Dividend, payable 1st December, 1909 | 360,000.00 | |
| | 12,966,376.81 | |
| Notes of the Bank in circulation | | 27,366,376.81 |
| Deposits not bearing interest | \$13,245,289.00 | |
| Deposits bearing interest | 51,401,226.27 | |
| Balances due to other Banks in Canada | 128,445,206.58 | |
| | 124,648.04 | |
| | | 193,216,369.89 |
| | | \$220,582,746.70 |

ASSETS.

| | | |
|--|-----------------|------------------|
| Gold and Silver coin current | \$ 5,802,263.05 | |
| Government demand notes | 13,240,587.00 | |
| Deposit with Dominion Government required by act of Parliament for security of general bank note circulation | 600,000.00 | |
| Due by agencies of this bank and other banks in Great Britain | \$ 8,719,654.41 | 7,331,267.66 |
| Due by agencies of this bank and other banks in Foreign countries | 7,425,676.78 | 11,959,588.00 |
| Call and short Loans in Great Britain and United States | 77,212,382.00 | 40,689,956.00 |
| | 93,357,713.19 | |
| Dominion and Provincial Government Securities | 1,445,570.61 | |
| Railway and other Bonds, Debentures and Stocks | 9,575,608.60 | |
| Notes and Cheques of other Banks | 4,560,501.23 | |
| | 128,582,243.74 | |
| Bank Premises at Montreal and Branches | | 600,000.00 |
| Current Loans and discounts in Canada and elsewhere (rebate interest reserved) and other assets | \$91,173,656.56 | |
| Debts secured by mortgage or otherwise | 143,552.13 | |
| Overdue debts not specially secured (loss provided for) | 83,294.27 | |
| | 91,400,502.96 | |
| | | \$220,582,746.70 |

E. S. CLOUSTON,
General Manager.



CIVIC NOTES



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WESTERN CIVIC NOTES.

AYLMER, ONT. The Council will re-build the water and light plant recently destroyed by an explosion.

AMHERST, N. S. President J. A. Johnson, Board of Trade, and Ex-Mayor Mellreith, Halifax, spoke to a large gathering of business men in favour of the extension of the C. P. Ry. through Nova Scotia to Halifax, and the plan was warmly endorsed.

BERLIN, ONT. Mayor Hahn and Mr. Edward Smythe, President of the Board of Trade, formed a deputation to Premier Whitney to ask to have the regulation abrogated, which compels the City to obtain the consent of similar industries before granting a bonus to a new one.

BRANTFORD, ONT. The Waterous Engine Works, Ltd., has purchased the Seagrave Fire Apparatus Co.'s plant at Walkerville, Ont., and will remove it to this city; they have acquired additional space adjoining their works for extension. — The Federal Government has offered to give a \$150,000 post office, but wants the City to give up part of the Market Square.

COBOURG, ONT. The Council has approved the plans of the C. N. Ry. for entering the town, and withdrawn the petition for a joint C. N. Ry. and G. T. Ry. station.

COLLINGWOOD, ONT. A by-law will be submitted giving a lease of land at a nominal rent and exemption of taxes for a Marine Railway and Shipbuilding concern.

FORT WILLIAM, ONT. The total amount of coal landed here from vessels this season is 1,385,000 tons.

GODERICH, ONT. The Horticultural Society has laid a plan for beautifying the town before the Council; the Society gave prizes for the best kept premises. — The Federal estimates include \$80,000 for the improvement of this Harbour.

HALIFAX, N. S. A Museum of Fine Arts will be established. — The proposal to induce the C. P. Ry. to extend their line to this city, which was laid before the Railway Management in Montreal by Mayor Chisholm and President J. T. Johnson, of the Board of Trade, is being warmly endorsed by the places which will also be benefitted all along the route.

HAMILTON, ONT. The Council has, after three years' discussion, passed a by-law to take 1,000 h. p. for 30 years from the Hydro-Electric Commission; this will be used for the beach pumping and the sewage plants, but more can be taken later on; the electors had already voted to use this power, in preference to the Cataract Power Co. — A by-law to add \$25,000 to Carnegie's gift of \$75,000, for a new library, will be submitted, and another to purchase the old Library for \$25,000. — It is believed that the C. N. Ry. will enter the City next spring. — One of the wharves collapsed under a load of wire, burying a workman under it. — The Cataract Power Co.'s power was shut off by the accumulation of ice at DeCew Falls, and the city was in darkness.

HULL, QUE. As the School Board has refused to renew the exemption from taxes of the Eddy Co., the Company has had to pay \$11,999 this year, instead of \$1,300 as formerly.

LONDON, ONT. The Railway Commission will take up the question of track elevation after the new year opens. — The London Electric Co. is offering to sell out to the City.

MONTREAL. The scheme of a tunnel between the Windsor St. and Place Viger Stations of the C. P. Ry., is again being talked about; it would be only 1 1/4 miles long, while the present mileage, back of the Mountain, between the two stations, is 18 miles. — The central Y. M. C. A. building on Dominion Square has been sold to the Sun Life Insurance Co., for \$250,000. — The annual plan of a new railway bridge and tunnel across the river is revived by the incorporation of a railway from Eastern Quebec to Ottawa, via Montreal. — The Gentlemen of the Seminary of St. Sulpice, it is stated, are intending to erect and equip a Public Library. — Prosecutions for the smoke nuisance are being taken out. — It is once more stated that a part of the block opposite the Post Office, belonging to the Seminary, has been sold, the price named being \$50 per foot; it is now paying 25 per cent. on the investment. — The Art Association is discussing a proposal to erect a large building to cost a million dollars. — The old part of the Post Office is to be remodelled at a cost of \$80,000, the new part being utilized in the meantime. — The C. P. Ry. is said to have arranged to put up a 10 story office building to replace the old St. Lawrence Hall. — A by-law has been passed forbidding all girls and boys under 10, from selling newspapers in the streets. — A by-law to shorten the hours in which saloons are open is being taken up in the Council. Mayor Garneau, Quebec, has written, saving what an improvement the same system has made in Quebec; the by-law calls for saloons being open from 7 a. m. to 10 p. m. on week days, except Saturday, when the hours are 7 a. m. to 7 p. m.

NEW GLASGOW, N. S. A new company has taken over the Flour Mills and will erect a grain elevator here.

NOTRE DAME DE GRACE, QUE. The town is willing to be annexed to Montreal, but asks that the City shall spend \$1,000,000 on public works in the first 3 years; build 3 police and fire stations; not add to the liquor licenses; tax farm land at \$1.00 per acre and abolish toll gates.

OTTAWA. The direct service by the C. N. Ry. to Quebec has been started.

KINTORE, ONT. The Town Hall has been burned down.

KINGSTON, ONT. The Street Railway Co. is tearing up its tracks, as it cannot agree with the City Council.

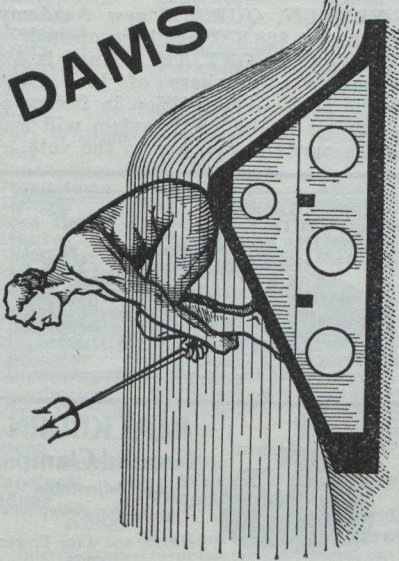
PORT ARTHUR, ONT. The increase in traffic on the street railway has led to the purchase of 4 new cars. — The first shipment of iron ore has been made from this port. — The City has arranged for 1,000 h. p. temporarily from the Kaministiquia Power Co., and has purchased 24 tons of copper wire. — By-laws to purchase power from the Hydro-Electric Commission, from the



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EASTERN CANADA.

BRANDON, MAN. The new gas plant is in operation.

CALGARY, ALTA. A proposal is being discussed for an automobile speedway from this city to Banff, 75 miles; it will cost \$150,000.

CAMROSE, ALTA. The G. T. P. has been constructed to the City and will reach Calgary in the spring.

CHILLIWACK, B. C. A plan for drainage is being discussed.

FERNIE, B. C. The new water system is at work, and a test shows a force of 125 pounds; the wells will now be closed up.

KINDERSLEY, SASK. Eight weeks after this town-site was sold, there are 200 buildings, including a steam heated hotel, and a Board of Trade with 28 charter members has been formed.

LETHBRIDGE, ALTA. No less than \$80,000 has been spent this year on road ways and sewers, and \$200,000 on the new power plant. — The Provincial Government will establish an Agricultural High School here, in connection with an experimental farm.

MEDICINE HAT, ALTA. The acquiring of a Carnegie Library is being advocated by Ex-Mayor Forster. — The by-law bonussing the Alberta Clay Products Co. was carried by 267 votes to 10.

NELSON, B. C. The Royal Bank is altering the premises recently bought at a cost of \$10,000.

NEW WESTMINSTER, B. C. Ald. Adams and Gray, and City Solicitor McQuarrie has been at Ottawa to represent the City's wishes on the Coquitlam Dam. — The Board of Trade is formally objecting to the inclusion of the North Arm of the Fraser in the scheme of Vancouver's Harbour Extension, as it is claimed that this is already included in the Port of this place. — The new pipe works is to be at work this month. — Plans have been prepared for storm sewers to cost \$10,000. — The dredging in the river has done to a depth of 24 feet at low tide from the north of the river.

NORTH VANCOUVER, B. C. The plans for a sewage system have been completed; it is estimated to cost \$58,935. — The tenders for a new concrete wharf has been accepted, the price being \$28,952. The Ward system is being advocated, and it is proposed to spend \$5,000 on parks and \$10,000 on road machinery.

PRINCE RUPERT, B. C. The lighting plant which supplied the city has been destroyed by fire.

REVELSTOKE, B. C. The new Custom House will be commenced in the spring.

SASKATOON, SASK. The property assessment, based on market value of the land and sixty per cent. of the improvements, is \$8,196,767; in 1902, it was \$288,893.

VANCOUVER, B. C. Plans for 14 miles of new water mains have been approved. — The contract for the new Cambie St. bridge has been awarded. — The Federal Government will spend \$90,000 on the Harbour at once. — Provincial Government will be asked to exchange the Courthouse for the old City Hospital, so that the site of the former may be used for a City Hall. — Entirely new imports at this port are Japanese oranges and Chinese eggs. — The Property Owners' Association wants a by-law limiting buildings to 10 stories and 150 feet. — The Board of Trade wants a new City Hall and a Board of Control.

VICTORIA, B. C. The G. T. P. is calling for tenders for wharves which will cost about \$100,000. — The electors will vote on having a Board of Control.

WINNIPEG, MAN. The Bank of Montreal will commence their new building in spring; it will cost \$1,250,000. — Local improvements were constructed during the past year, which cost \$1,069,625, of which \$660,396 was for asphalt pavements. — It is proposed to have a "trouble" man at the City Hall, who will receive the complaints, many of which are trivial, from citizens. — A break-down in the Winnipeg Electric Railway Co.'s plant paralysed the City for several days; 170 factories were closed, and elevators, street cars and lights were all out of service; the "stand-by" steam plant proved both inadequate and insufficient; it only provides for 8,000 h. p., while the Company was supplying 17,000 h. p., so that it is 9,000 h. p. too small; yet the Company claimed, in Court, that it was not bringing power from outside the city; the City supplied some power to help out the situation; City Engineer Cambridge stringing up wires at once to connect up; City Engineer Ruttan at once got the power plant into readiness immediately.

TENDERS

FOR STEEL SUPERSTRUCTURE
FOR LOUISE BRIDGE.

Sealed tenders, addressed to the Chairman Board of Control, will be received at the office of the undersigned up to 11 a.m. Tuesday, January 18, 1910, for removing the present superstructure and furnishing and erecting new superstructure and floor, complete, for Louise Bridge across the Red river. Plans, specifications and forms of tender, together with conditions governing tenders, as prescribed by by-law, may be obtained at the office of the City Engineer, Winnipeg. The lowest or any tender not necessarily accepted.

M. PETERSON,
Secretary.

Board of Control Office,
Winnipeg, Dec. 8, 1909.

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CHAS. V. GLADWELL,
Chartered Accountant.

EASTERN CANADA—Continued.

Michigan and Ontario Power Co. (Mr. James Conmee's Co.) will be submitted to the ratepayers. — A contract has been made by the City with the Canadian Linen and Paper Co., to establish a factory costing \$50,000 and employing 150 men; the City gives a site and exemption from taxation. — A seven days' campaign has realized \$36,000 for the Y. M. C. A. — The municipal telephone and light wires have been placed in conduits on the main streets, and only the Bell Telephone Co.'s poles remain, carrying the few wires they use. — Plans for the buildings of the Western Dry Dock and Shipbuilding Co. have been received here. — The C. P. Ry. steamers will have daily sailings next season. — The steel for the new C. N. Ry. hotel has been received and work has been commenced.

PORT COLBORNE, ONT. The by-law granting a franchise to the Sterling Natural Gas Co. was carried by a majority of 22.

SHERBROOKE, QUE. The G. T. Ry. has decided to make this a divisional point and is purchasing land for yard room.

SIMCOE COUNTY, ONT. Eleven miles of roads have been completed this year, making a total of 370 miles on the last six years, since the Good Roads movement began.

SMITH'S FALLS, ONT. The water-works plant has given \$7,000 in cash profits to the Council for 1909.

ST. CATHARINES, ONT. The Lincoln County Council entertained the Welland County Council at a banquet, after a joint session of the two Councils, in which matters of common interest were discussed. — A second water main, 24 inches in diameter, will be laid from the reservoir; it will more

than double the present supply. — The Crocker-Wheeler Mfg. Co., of Ampere, N. J., will build a factory here, and will employ 100 first class mechanics. — The supply of natural gas has been so poor that many citizens have had no heat for warmth or cooking; it is claimed that the Company is delivering so much to a large factory that it is letting the ordinary citizens suffer.

ST. LOUIS, QUE. The Town will expect the City of Montreal to take over the pay roll as follows, when annexation is completed: City clerk and city treasurer's office, \$12,870; road department, \$40,000; police department, \$24,550; fire department, \$9,478; health department, \$4,404; other officers, \$6,725; total, \$97,027.

TORONTO, ONT. A picture exhibition has been opened in the new Reference Library; it will be free on certain days. — It is proposed to widen St. Clair Avenue between George and Bathurst Sts., the cost being estimated at \$170,000; not more than 25 per cent. of the cost is recommended to be paid by the City. — The Polson Iron Works is asking for 50 acres in Ashbridge's Bay, and proposes to build a dry dock there. — The Morality Department has been abolished by the Police Commissioners, and the work will be carried on in a different way. — Three by-laws will be submitted to the ratepayers; for \$759,000, to extend Bloor St. and build a viaduct; \$320,000 for new buildings for the Exhibition, and \$262,000 for land and buildings for six fire and four police stations. — Mr. J. G. Sing, Federal District Engineer, states that the harbour can be made a splendid one by properly designed development; the present entrances are ideal; he recommends the City to construct wharves. — A proposal has been made to construct a tube railway and operate it for 12

years without expense to the City, at which time the City may take it over at 10 per cent. above cost price; the franchise of the Street Railway also expires in 12 years. — Earls court and part of Dovercourt will be annexed to the city. this will mean an addition of about 7,000 in population.

QUEBEC. The town of Limoilou has been annexed to the City. — The contract has been awarded for the piers of the new bridge; the amount is \$2,500,000; the successful tenderer is Mr. M. P. Davis, who constructed the old piers; the piers in the river will be demolished and new and larger ones built, further from shore; 3,000 men will be at work next season.

VERDUN, QUE. A new Academy, which cost \$28,870, has been opened.

WINDSOR, ONT. The Council is discussing the purchase of land for a public park. — A petition in favour of returning to the ward system will lead to the matter being put to the vote.




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| Delta | Owen Sound | Brandon | Neepawa |
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REST. 12,000,000.00

UNDIVIDED PROFITS 603,796.30

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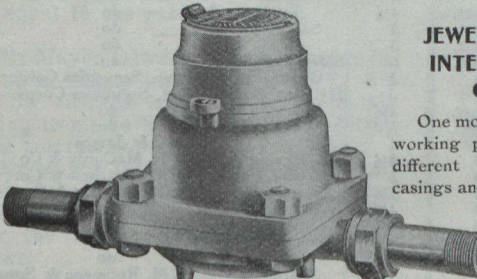
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Paid Up Capital \$4,000,000. Reserve Fund \$4,500,000.

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IMPERIAL BANK OF CANADA

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HEAD OFFICE, - - - - - TORONTO.

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| Gowganda | St. Catharines | Broadview | Michel |
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| Harrow | St. Davids | North Battleford | Nelson |
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SALE OF BONDS FROM 21ST NOVEMBER TO 20TH DECEMBER

| PLACE | Population | Assessed Value | Debenture Debt. | Sinking Fund | SALES | | | | PURCHASER |
|--------------------------|------------|----------------|-----------------|--------------|----------|--------------|----------|------------------|-------------------------|
| | | | | | Amount | Years to run | Interest | Purpose | |
| Fernie, B. C. | 5,000 | | | | \$25,000 | 30 | 5 | .... | G. A. Stimson & Co. |
| Colchester N. Thp., Ont. | 1,821 | \$822,430 | \$28,212 | .... | 9,633 | 10 | 5 | .... | do |
| N. Vancouver, B. C. | 1,600 | 3,054,829 | 75,000 | .... | 30,000 | 30 | 4½ | General | do |
| do | " | " | " | .... | 15,000 | 30 | 4½ | Water W. | do |
| do | " | " | " | .... | 17,474 | 20 | 5 | L. I. | do |
| Maidstone Thp., Ont. | 2,803 | 1,770,017 | 27,214 | .... | 11,921 | 10 Inst. | 5 | Drainage | do |
| West Zorra Thp., Ont. | 2,502 | 2,919,730 | 20,086 | .... | 7,000 | 10 Inst. | 5 | do | do |
| Winchester, Ont. | 1,224 | 490,699 | 5,783 | .... | 12,249 | 20 Inst. | 5 | Cement S'walks | do |
| Lucknow, Ont. | 1,078 | 309,761 | 24,578 | 11,521 | 3,500 | 15 Inst. | 5 | Mun. Buildings | do |
| Osgoode Thp., Ont. | 4,142 | 1,563,382 | 40,689 | .... | 7,456 | 10 Inst. | 5 | Drainage | do |
| Roxborough Thp., Ont. | 4,287 | 1,736,797 | 59,086 | .... | 11,681 | 5 & 10 Inst. | 5 | do | do |
| Dover Thp., Ont. | 3,977 | 2,278,788 | 55,928 | .... | 11,206 | 5 & 10 Inst. | 5 & 6 | do | do |
| New Westminster, B. C. |  |  |  | .... | 400,000 | 50 | 5 | W. Works, &c. | do |
| Stamford Thp., Ont. | 2,525 | 1,492,730 | 5,535 | .... | 5,961 | 20 | 5 | L. I. | do |
| Elma Thp., Ont. | 3,431 | 3,576,195 | 65,084 | .... | 15,167 | 10 Inst. | 4½ | Drainage | do |
| Harwich Thp., Ont. | 4,866 | 3,867,184 | 29,028 | .... | 8,700 | 5 & 10 Inst. | 5 | Drain & Sep. | do |
| Markdale, Ont. | 896 | 310,890 | 10,714 | .... | 10,000 | 10 & 30 | 4½ | L. I. | do |
| Petrolia, Ont. | 4,185 | 1,285,310 | 648,628 | 3,315 | 14,536 | 20 | 4½ | Brick Pavement | Brent, Noxon & Co. |
| do | " | " | " | " | 4,000 | 20 | 4½ | Bridge | do |
| do | " | " | " | " | 2,000 | 30 | 4½ | L. I. | do |
| Halbrite, Sask. | .... | .... | .... | .... | 3,000 | 15 | 5 | Perm't Imp. | do |
| Cardston, Alta. | .... | .... | .... | .... | 7,456 | 10 Inst. | 5 | Drainage | do |
| Georgetown, Ont. | 1,512 | 413,578 | 52,069 | .... | 3,150 | 20 Inst. | 5 | L. I. | do |
| Newmarket, Ont. | 2,839 | 841,809 | 6,880 | .... | 20,000 | 20 Inst. | 5 | Perm't Imp. | do |
| Point Grey, B. C. | .... | .... | 350.09 | .... | 28,000 | 25 | 5 | School | Wood, Gundy & Co. |
| Strathroy, Ont. | 2,900 | 1,088,470 | 81,257 | .... | 20,000 | 20 Inst. | 4½ | Loan | do |
| do | " | " | " | .... | 1,191 | 10 Inst. | 5 | Sidewalks | do |
| Midland, Ont. | 4,049 | 1,304,651 | 307,824 | .... | 12,000 | 20 Inst. | 5 | do | do |
| do | " | " | " | .... | 2,376 | 20 Inst. | 5 | Sidewalks & Sew. | do |
| Pipestone, Man. | 1,886 | 2,043,675 | .... | .... | 25,000 | 20 | 4 | Govt Guar | Dom. Securities Corpor. |
| Guelph, Ont. | 13,700 | 5,440,000 | 1,140,138 | 156,279 | 50,000 | 30 | 5 | Hy. Elec. Power | Ont. Securities Corps. |
| Victoria Co., Ont. | .... | .... | 40,000 | 5,560 | 20,000 | 90 Inst. | 4½ | Bridge | do |
| Portage la Prairie, Man. | 3,658 | 2,699,652 | .... | .... | 70,000 | 30 Inst. | 5 | Water W. | do |
| Minota, Man. | 1,603 | 1,606,729 | .... | .... | 12,000 | 20 | 4 | .... | Nay & James |
| Pictou, N. S. | .... | 1,067,630 | 235,600 | 5,590 | 9,000 | 10 | 4½ | Paving | F. B. McCurdy & Co. |
| Chatham, Ont. | 9,942 | 4,885,409 | 940,980 | .... | 50,000 | 30 | 5 | Hy. Elec. Power | R. C. Matthew & Co. |
| Orillia, Ont. | 5,167 | 1,741,280 | 419,377 | 2,855 | 50,000 | 30 | 4½ | Sewerage | C. H. Burgess & Co. |
| do | " | " | " | " | 50,000 | 20 | 4½ | Loan to Co. | do |
| do | " | " | " | " | 20,000 | 20 | 4½ | School | do |
| do | " | " | " | " | 15,000 | 20 | 4½ | Cement Walks | do |
| do | " | " | " | " | 3,000 | 20 | 4½ | Park | do |
| St. Stephen, N. B. | 5,000 | .... | .... | .... | 100,000 | .... | 4 | Water W. | J. M. Robinson & Sons |
| Outremont, Que. | 3,000 | .... | .... | .... | 50,000 | .... | 4½ | R. C. School | W. Graham, Browne & Co. |
| Elgin Co., Ont. | .... | .... | 41,398 | .... | 20,000 | 10 Inst. | 4½ | H. of Refuge | A. O. U. W. |
| Sarnia, Ont. | 9,706 | 4,658,045 | 648,628 | 3,345 | 31,361 | 20 | 5 | .... | F. Smith |
| Lindsay, Ont. | 7,275 | 2,437,900 | 358,140 | 11,140 | 15,000 | 20 | 4 | School | Hanson Bros. |
| do | " | " | " | " | 10,000 | 30 | 4½ | Water W. | do |
| Ottawa, Ont. | 69,881 | 41,318,150 | 7,113,367 | 2,895,544 | 160,000 | 30 | 4½ | Sep. School | R. Wilson-Smith |
| Lacombe, Alta. | | | | | 25,000 | 20 | 5 | | Union Bank |



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We especially invite correspondence.

VANCOUVER, B. C. By-laws will be submitted this month totalling \$1,374,000 as follows: School extensions, \$274,000; exhibition, \$80,000; park improvements, \$50,000; park purchases, \$324,000; fire halls, \$35,000; juvenile house of detention, \$20,000; streets, \$500,000; supplementary by-law for causeway across Coal harbour, \$80,000.

WINNIPEG, MAN. City Comptroller Evanson reports the expenditure for the half year as follows:—

Board of control (finance), \$207,325.15; Miscellaneous appropriations, \$59,439.75; Street commissioner, \$142,023.85; Works and property committee, \$38,067.29; Fire, water and light committee, \$118,984.00; Market, license and relief committee, \$12,150.97; Library committee, \$12,209.97; Health committee, \$59,439.63; Police commission, \$70,573.24.

BLANSHARD THP., ONT. The by-law to give a bonus of \$20,000 to the St. Marys & Western Ry. was carried by 244 to 240.

HAMILTON, ONT. The City's general debt is \$4,875,802, besides \$468,240 for its shares of local improvements; thus the total debt is \$5,344,042. Sinking fund and interest absorb \$279,000 annually.

STELLARTON, N. S. The assessment value of real estate is \$602,650.

OTTAWA, ONT. The Separate School Commissioners have sold \$160,000 30-year bonds to Mr. R. Wilson-Smith, Montreal.

DARTMOUTH, N. S. Debentures for \$5,000, 20-years 4 per cent, will be issued for extensions to the water and sewerage plants.

MONTREAL. The assessment of property is \$259,432,234; the value of exempted property is \$68,419,083; the estimated revenue for next year is over six millions.

ELORA THP., ONT., has sold \$15,167 10-instalment 4 1-2 per cent. debentures to Messrs. G. A. Stimson & Co, Toronto.

WEST ZORA THP., ONT., has sold \$7,000 10-instalment 5 per cent. debentures to Messrs. G. A. Stimson & Co., Toronto.

HARWICK THP., ONT., has sold \$5,961 15 and 5-instalment 5 per cent debentures to Messrs. G. A. Stimson & Co., Toronto.

The Traders' Bank of Canada has opened a branch in Montreal.

MAIDSTONE THP., ONT., has sold \$11,921 10-instalment 5 per cent debentures to Messrs. G. A. Stimson & Co., Toronto.

WINCHESTER, ONT., has sold \$12,249, 20-instalment 5 per cent. debentures to Messrs. G. A. Stimson & Co., Toronto.

LUCKNOW, ONT., has sold \$3,500 15-instalment 5 per cent. debentures to Messrs. G. A. Stimson & Co., Toronto.

EASTERN TOWNSHIPS' BANK.

The fiftieth annual report shows profits, after deducting all charges, and providing for losses, was \$390,535, which is equal to a little more than 13 per cent. on the paid-up capital of \$3,000,000; to this was added \$215,306, the balance from last year, and this was appropriated as follows:—dividends amounting to 8 per cent, \$240,000; added to Reserve Fund, \$100,000; strengthening assets, \$100,000; bonus to officers, \$15,000; officers' fund, \$2,000; balance carried forward, \$148,841. The Reserve Fund is now \$2,100,000.

BANK OF OTTAWA.

The 35th annual report of the Bank of Ottawa shows net profits of \$421,065, which is equal to over 14 per cent. on the present paid-up capital of \$3,000,000. This, with the balance from last year of \$405,991, was appropriated as follows:—dividends, 10 per cent, \$303,786; reduction on bank premises, \$57,351; officers' pension fund, \$10,000; balance carried forward, \$453,920. In October, 5,000 new shares were issued at a premium of 100 per cent. The Rest is equal to the paid-up capital.

Ex-Mayor Edward Brown, Portage-la-Prairie, Man., was banquetted by his fellow citizens on the occasion of his going to reside in Winnipeg; an address and portrait were presented to him.

Ex-Mayor Joshua Dyke, Fort William, Ont., who has greatly recovered from his recent illness, has gone to Bermuda for the winter, accompanied by Mrs. Dyke.

Mr. Harry L. Dennison, K. C., Town Clerk of Digby, N. S., has been chosen as Liberal candidate for the Provincial Legislature.

Ex-Mayor A. E. Planta was elected to the Legislature for the City of Nanaimo, B. C.

LEGAL.

The Montreal Street Ry. Co. has been fined \$25 and costs for operating freight cars through the city streets, contrary to their contract, by Recorder Weir.

Judge Clute, Chatham, Ont., has decided in the case of Hadley Lumber Co. vs. Mayor Westman et al., that it is legal for the Water Commissioners to enforce a by-law substituting a meter rate instead of a flat rate for factories.

A sewerage by-law of Dunnville, Ont., has been declared invalid Chief Justice Meredith, Toronto, because it did not provide for payment of the cost by the local improvement plan.

Monette vs. City of Montreal. An action for damages for slipping on an icy sidewalk. The Court of Review, Montreal, confirmed the judgment of Judge Martineau, Superior Court, who dismissed the case, as all reasonable precaution had been taken, and the accident resulted from climatic conditions.

Mrs. Charles Anderson vs. City of North Vancouver, B. C.. This was an action for \$5,000 damages for injuries received in hand and foot at the ferry wharf. Judge McInnes dismissed the action as plaintiff's own carelessness was proved.

Chief Justice Sir William Mulock has dismissed the action, with costs, of Mr. J. Ross Robertson against the City of Toronto, in which he asked to have set aside the sale by the City to the National Iron Works of a block of land in Ashbridge's Bay. His Lordship said that the action of the Council was business-like, and the terms of the sale were good; he said that plaintiff had not even implied any bad faith, nor had he any property that was interested in the sale.

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*Preserves Roads
Prevents Dust -*



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TARVIA FOR SMALL CITIES

Tarviated macadam, i. e., macadam which has been bonded with TARVIA to preserve the roadway and prevent dust, furnishes an ideal pavement for the streets of small cities. It gives to the macadam the appearance of sheet asphalt; is clean, quiet and durable; while its cost is frequently less than that of untreated macadam on account of the great saving in maintenance.

The city of Niles, Mich., for instance, is enthusiastic over the success of the TARVIA applications on two of its best streets. The local paper states that "it gives the greatest of satisfaction, and the town now has two splendid roadways. Rescued from the slush and mud, St. Joseph Avenue has just been transformed into a thing of beauty and a joy forever. East Main Street has been treated likewise and in consequence Niles has two stretches of roadway that will make our citizens want more of the same kind."

TARVIA is the only well-tried material for binding macadam roads to prevent dust and excessive wear. It gives greater cohesion and a degree of elasticity such as to cause the road to be smoothed out by traffic without pulverizing.

TARVIA is made in three grades to suit various conditions of surface. On a new road where the interstices are large, TARVIA X is used, a very heavy viscid substance with sufficient strength to bind the stones of new macadam. TARVIA A, a more fluid material, is used on the surface, while TARVIA B, the lightest, is applied as a dust suppressor.

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The Carritte-Paterson Manufacturing Co., Ltd.

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HALIFAX, N. S.