GOOD ROADS NUMBER

VOLUME XII. MARCH, 1916 No. 3

# THE CANADIAN MUNICIPAL JOURNAL

OFFICIAL ORGAN
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MUNICIPALITIES

*A Review of Canadian Citizenship*

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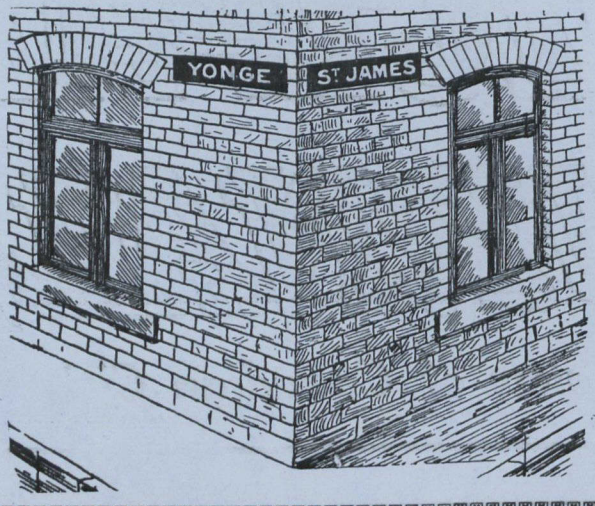


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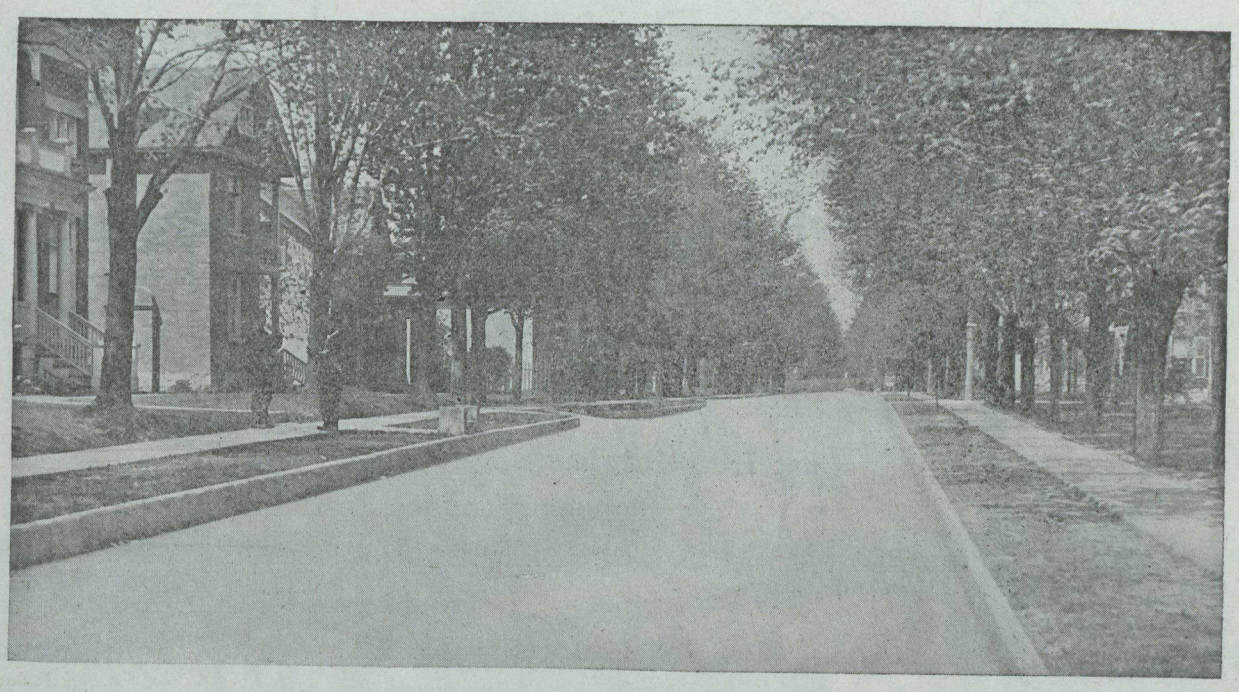

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Official Organ of the Union of Canadian Municipalities

*'Municipal from cover to cover"* *Circulates in every city, town and village*

Vol. XII MARCH, 1916 No 3

CONTENTS.



## Good Canadian Roads

When the history of Canada's material building up is written—how the arteries for her commerce were made by a grim but successful partnership of nature and man—a long, interesting chapter will be given to the development of her highways; from the portages of the earliest of days to the automobile roads of the present day. Between the two periods, each of epoch making significance, it will be found that every kind of experiment and test have been made to get results, and not always of the right kind. It is only within quite recent years that the interest of serious men began to centre on the road as a factor in our communal life. The farmer, who had previously never seemed to care if his team was held up for a few hours through a washed-out road, now made strong objection if his automobile was even splashed by the muddy road. The coming of the automobile had made him think. He rightly figured that transportation of his produce was costing him more from his farm to the railroad depot or elevator, than from depot to destination, which might be some spot in far away Europe. He demanded better roads, but soon stopped shouting when he found that he had to pay for them. Real taxation and communal responsibility were something new. He had not yet come to the knowledge that a good road in front of his holding was just as much a capital investment as the crops on his land. But gradually, with the advice of such men as McLean of Ontario, and Michaud of Quebec, and the aid of the Provincial Governments, and the splendid work of the Good Roads Associations, he came to his better self, and now some 40,000 miles of really good highways have been laid in the rural parts of Canada. And this is only a good start.

The potentiality of the building of roads is immeasurable, both in the material and social life of this Dominion. While the vast railroad and waterway systems—each the greatest in the world—must of necessity and choice always be her main arteries of transportation, much sustenance is required for their maintenance, and the more perfect the highways and roads, the easier it will be to feed them—with reciprocal results. As with our national transportation system, so it is with the provincial and district systems, only more so, for the better the local transportation facilities the better and sweeter the social life. The day is rapidly passing when men and women will exile themselves to the life of loneliness, which the great pioneers of this country had to bear as their hardest lot. The study of nature is a great lesson, but the study of humanity is infinitely greater and broader, and the spending of a dollar in the building of a road to make that study easier for our fellow citizens in the rural parts of Canada, is surely helping in the consummation of the Canada of our best thoughts.

# A National Highway

The Good Roads Congress brings a suggestion from British Columbia for the building of a national high way across Canada. No doubt other schemes of a like nature have been mooted from time to time, to be put aside as impracticable, but the time is coming when a national highway will be found to be a necessity to serve as a trunk road for the many highways now crisscrossing every province. We believe that such a road, built of good Canadian cement, good Canadian gravel and sand, and where it runs through a city or town, with a layer of bitumen, with its three thousand miles of tributary highways, would be a national monument to Canadian faith and virility. We even believe that such a road should be built by subscription rather than by borrowed money. As a monument of peace—when the war is over—Canada could have no grander conception, or anything so ultilitarian.

# Forms of Municipal Government

Not during the history of the municipal life of Canada has there been a keener interest in its problems and its progress than at the present moment. This has been specially manifested in the Commission of Conservation bringing together all the many forces that have influenced, each in its way, the minds of the citizens to a sense of the meanness of individual selfishness and the necessity for better co-operation if our people are to get the full benefit of citizenship in any city, town or rural township in the Dominion. In possibly no other country in the world is the right of the individual so free. Practically in all the provinces there is local control in civic government. A community can choose its own form of government, consequently every form is in force—aldermanic committees, controller, commission, commission and manager. As to which is the best system we frankly don't know. All have been successful under certain conditions, but for any one to state that any particular system is the only one for all Canada does not know what he is talking about—he certainly cannot realize the local influences that bring about these local conditions, and until our would be reformers have studied every part of Canada—and less of other countries—they have no right to even attempt to introduce any universal form of local government.

The present form of government in most municipalities in this country is that of mayor and aldermen or councillors, with committees; based on the system in vogue in Great Britain. This form as applied to the Old Country is considered the most successful in the world. But they have across the water provisions and checks which we have neither here nor in the United States, at least up to the present. For instance they have the great government department —the Local Government Board—to which every English municipality is responsible for each action done. An English municipality cannot build a sewer nor raise a dollar without its sanction, which is only received after a close enquiry in each case. In Scotland and Ireland separate local government boards are in existence. Owing to the fact that municipal officials are responsible to the Local Government Board as well as to the council, assuring efficiency in the municipal service, much of the actual work is left in their hands, making the position of the members of the council very largely a sinecure. It is true that most of the English municipal work is done in committee, but even there the details are worked out by the officials—in fact, left to them—the members of the committee knowing full well that every item will be properly checked and audited by officials of the Local Government Board. The system has resulted in the best local men seeking the suffrages of the citizens because of the social standing gained without having to dive into details, at once tedious and foreign to the average citizen. The British form of local government is also in existence in Australia, New Zealand, South Africa, and where it is allowed, in India, but in each country there is the check of one central authority only.

In the United States civic government has not been a success for two principal reasons. First it was originally based on the Federal form of government, which however successful in dealing with the larger affairs of state has evidently not worked out well in local politics, and second there is no real check. Each of the local councils is a power unto itself, responsible only to the State legislature—a responsibility as divided as there are members—making it comparatively easy for the self-interests to control matters, either in the local council or through the legislators. It was this system that made it possible for Tammney rule in New York. Further the United States is essentially a country of individualists—or selfishness. The Commission form of government is in force in about 350 cities and the manager form in 45 cities in the United States. But be it understood that where either of these forms of administration are in force the populations are very small, with the exception of Dayton, Ohio, which has a population of about 120,000.

Conditions in Canada are somewhat different to those in the United States. There has always been a better public spirit in the Dominion, though not by any means so large as it might be, and we yet fail to see that the aldermanic system is a complete failure. We believe that it is not the success it should be because of the absence of a proper check on the one hand and on the other any public spirit we might have is divided. We frankly admit that the Commission form where it has been tried has been a success generally but we do maintain that it is because of the personnel, rather than the system. This brings us back to our opening. We welcome this new public interest in civic problems. This is the great hope for the future of municipal government in Canada. As that interest grows so will the reformers realize the responsibility of their thrusting new theories on the electorate. More common sense will prevail; municipal executives will feel that their labour is better appreciated and real civic reformers will know that their studied propagandas for the good of the community will have a better chance of being tried out. It is a bigger and truer civic spirit that is wanted in this country, not so many innovations that will destroy that spirit.

# Forest Fires and Their Prevention

Recently the Hon. Mr. Allard, Minister of Lands for the Province of Quebec, received a deputation of local limit holders, who are necessarily interested in the prevention of forest fires. This problem of how to prevent the destruction of our forest wealth has occupied the minds of thinking men for some time. The Commission of Conservation and the Canadian Forestry Association have had their best men investigating the sources of the trouble, and the conclusion come to is that the slash burning operations of settlers constitute the chief danger. While it is recognized that the use of fire is necessary in the preparation of land for cultivation the new settler would seem to be oblivious to the fact that fire can soon get out of control, with the consequence that thousands of acres of good forest are laid in waste every year through his criminal carelessness. In most of the provinces the authorities have been compelled to put into force stringent regulations against this waste. It has been found that the best method is the system of prohibiting the setting out of clearing fires except with a permit from government officers. In the Province of Quebec today this regulation is in force only from April 15 to June 15 and after Sept. 1st; meaning that between June and Sept. there is no control of any kind, which is absurd on the face of it.

The limit holders, who waited upon the Minister, now ask that the entire danger season be blanketed, and rightly so too, for during that two and half months of no control much forest can be destroyed. The petition also asks that the minimum fine for disobeying the regulations, which are as much in the interest of the settler as the state, be raised from the present paltry two or three dollars to $100, and that no option of a fine be given to the scoundrel found guilty of setting fire to the forest so as to get a job of fire fighting.

What the delegation asked of Mr. Allard is but in keeping with the new spirit of forest conservation and we would be surprised not to see the necessary amendments to the present law on the statute book before the sesion at Quebec is over.

B. MICHAUD,
Deputy Minister of Roads, Province of Quebec,
President of Good Roads Congress for 1916.

## A COMPREHENSIVE CITY PLAN.

We have just received the report of the City Plan Commission which was appointed three and a half years ago by the city of Newark, N.J. The report, which takes up 180 pages of letter press, and contains 43 illustrations and 31 plans and maps, is not only complete in itself, but the salient features are so well brought out as to grip the interest of the most casual reader. Such a report should become the standard for city plan commissions in Canada to work to.

The introduction, especially the first three pages, gives a strong argument for the citizen being actively interested in a plan for his city. At a number of places throughout the volume, the citizen is shown specifically, what part he can take in helping to put the plan into effect.

In a number of chapters it is shown just what changes need to be made in the laws of ordinances, in order to make it possible to carry out the plans satisfactorily.

The approximate cost of many features is worked out so that the citizens may have a clear idea of what the recommendations comport. What is still more important, the actual saving which the recommendations would mean to the community, are shown.

Proposals are presented only in a summary manner, but each is based on a thoroughly scientific study of all contributory factors.

The plans and recommendations are really comprehensive and cover in their proper proportion and relation, the whole range of city planning. The whole is roughly divided into four parts:

1. Streets and Transportation of all Kinks.
2. Recreation and Civic Beauty.
3. Housing and Public Control of Private Development.
4. Planning the Greater City, and a Programme of Future Work.

The most important of the **street changes** are now being carried out. The Commission has exercised its prerogative of passing on **land subdivisions** so beneficially that now operators come to the Commission before initiating new developments. The re-routing and re-scheduling of the **street car system**, and the **traffic regulations**, as proposed by the Commission have proved so effective in practice that now far more traffic is handled at the principal corners than three years ago and with less congestion.

A great municipal dock and industrial development has been carried out and is now ready for use.

It is recommended that the big municipal retail central market be sold and the proceeds used to build a modern efficient wholesale terminal auction market and four smaller local retail municipal markets.

The present splendid park system of Essex County is rounded out so as to take care of all parks in the greater Metropolitan district.

Civic beauty is treated not only with recommendations for the grouping of public building, etc., but by a number of concrete suggestions for avoiding ugliness along the streets.

Housing is treated not only with specific recommendations for amendments to the laws, but by an analysis of the whole relation of housing to city planning.

Public control of the development of private property and the methods of attacking the problem are dealt with in detail. However, the specific recommendations for restricting the height and use of buildings in Newark are given merely as illustrations, as the principles for concrete recommendations applicable to Newark could not be worked out without much intensive study of local conditions.

Unique contributions to the report are the review of the work which has been done in bringing together all of the surrounding communities, in working for one common plan for the whole district, and the suggestions for future work of the Commission — a choronological and financial programme, specifying how each of the recommended matters should be carried through during each five year period for the next fifty years in the order of their relative urgency and importance.

# The Juvenile Court

By MRS. ROSE HENDERSON.

"Juvenile courts are a farce," said a well-fed, red-faced man of middle age to me the other day. "Half those allowed on probation should be behind the bars, and the other half should be so severely punished that they'd remember it for the rest of their lives. It's the fear of God and man in their hearts these young rascals need."

"That's interesting," quote I, "have you ever been in a Juvenile Court?" "No," he answered, "but I've heard lots about 'em." I then proceeded to tell him that oft-repeated story of the man, a member of the Y. M. C. A., who while on earth heard terrible things about Hell. Being a good man, always doing and believing whatever he was told, he was admitted without question to heaven when he died. These stories, however, made a lasting impression on him, and after a short sojourn in heaven and failing to find his old friends there, he asked St. Peter permission to visit Hell, this was granted. He procured a return ticket, and set out for the firy furnace; but, La; and behold, when he arrived there he got the surprise of his life. There were the Prophets, Heretics, Scientists, and Higher Critics, who had been condemned on earth, working at the most up-to-date appliances, and inventions, turning the place into a veritable paradise, and instead of burning and sizzling as of old, they were singing and laughing with joy, working out their salvation instead of burning in it. Mr. Y. M. C. A. man joined the people so interesting. Kind and brotherly, he wanted to dispose of his return ticket, but couldn't find a purchaser.

"Hu," Mr. Man said, "that's mighty clever, and certainly a reflection on me, henceforth I'll go and see things for myself."

This man's point of view represents an altogether too numerous element in society. In spite of the hundreds of experiments and the volumes explaining the latest achievements of social, mental, and moral science, in crime and disease, its causes and cures, there are people who still cling to the old idea of the inherent wickedness of mankind, and corporal punishment as the only cure. This idea belongs to the dark ages, a time when men held in the hollow of their hands the lives of their wives, children and dependents. Fortunately for the race, especially the children, men and women are arising everywhere and proclaiming a new doctrine, culled from the great university of life. With the dawn of a new century, and a new world, we are looking more humanly on both the adult and juvenile delinquents.

Though many people's eyes are closed, and the courts still remain barred for the most part, the light of science is penetrating through the clouded windows of our tribunals of justice. We are beginning to realize that crime has its origin chiefly in something outside rather than inside human beings, that our social conditions are manufacturing crime just as it creates disease. In no place is this fact brought out more plainly than in the Juvenile Court. Here we see children the victims in nine out of ten cases of either present or transmitted environment, suffering from a social disease, a moral sickness which has its roots sunken deep into the body politic. These victims of our social ignorance and greed, in most cases, need a moral or physical doctor to minister to them, and not a policeman, lawyer, judge or jailor.

We know that social conditions such as fear, worry, hunger, protracted illness and unemployment are potent factors in creating disease and insanity, but we are not so candid in stating that these very same conditions drive people, young and old, to drink, immorality, crime, and vice of all kinds.

Nowhere is this so clearly demonstrated as in the child life of any great city, or industrial centre, and the Juvenile Court is the mirror reflecting these social sins. Men and women connected with this children's tribune cannot long disregard these truths. They are glaringly patent to all, save the most stupid, and from this great social school the progressive are going forth enunciating these facts which are changing the darkness and suffering of the penitentiary, into the brighter, more hopeful, and more constructive work of the reformatory, industrial school, or probation system, giving even the worst of people a chance to prove their worth. Upon these principles the Juvenile Court is founded. Upon these ideals rests its excuse for being, to protect the child, educate the community as to causes of crime, and degeneracy, and render justice—not more tyrannical, but more merciful, a more intelligent instrument for the defence and protection of the unfortunate victim, rather than a tool of retribution, and destruction. We have heard much about the protecting arm of the law, but alas! so far as human life is concerned, it is often not a protective but a destructive arm.

With the establishment of the Juvenile Court, however, this is changed, the law becomes a protector rather than a destroyer of the young life, the human element has entered in, and for the first time in jurisprudence the judge can take the little frightened lad by the hand and say, "little brother, never mind, we are all part of this world muddle, promise me you won't come here again," and in nine times out of ten the promise is kept; and instead of an embittered, resentful, embro criminal, there goes forth a young citizen inspired with new ideals of self-respect, and responsibility towards himself, the community, his home and parents; a citizen saved to the state.

With the establishment of Juvenile Courts thousands of dollars are saved annually to the state, but the saving in the lives and morals of these future citizens cannot be estimated in cold cash.

**The Juvenile Court is a place where we do something for the child instead of doing something to the child.**

A great human laboratory, into which the ills, sorrows and misdemeanors of the community are poured, it is a mirror of the social life of the city's children. Here every day is enacted comedy and tragedy, laughter and tears, and the actors in this drama are every day folks living life for the most part like the rest of us, as well as they know how. The Juvenile Court is a child saving station, a place where over ninety per cent of those who pass through are helped to a better understanding of themselves and life; a place where the inscription: "There is hope for all who enter here," has a real and a definite meaning and is being made manifest daily.

A place where the letter of the law is in abeyance, and must take second place to the greater law of conscience, love, science and justice.

A place where the inherent goodness of mankind is emphasized instead of the inherent badness.

A place where the state generosities to the child a "square deal" and to the contributors of child deliquency their just reward.

The Juvenile Court is not a place to punish children, but help and protect them from themselves and others. A place where the physician, moral and social doctors aided by the common sense of the law, help to solve intricate human and social problems. It is the extension of maternal rule into the larger life of the community.

This is one of the most important departments of the state, and the judge presiding over such a tribunal needs to have the patience of Job, the wisdom of Solomon, and the great tender heart of a world parent. In the hands of an unsympathetic, unqualified person, the Juvenile Court can become a chamber of horrors, a place of sorrow and discord to parents and children, and a source of great and necessary expense to the state.

The judge has in his hands the power of doing more harm or more good than any other judge on the bench, or in fact any other citizen, dealing as he is with the most primitive and basic emotions and instincts of the human race. The cold letter of the law has but little place in solving the problems of mothers and children, and only a man of great practical experience and one who understands human nature as does Judge Choquet could ever in a great complex cosmopolitan city like Montreal make the success which he has done of the Juvenile Court. There is no denying the fact the spirit of a Juvenile Court is whatever the judge makes it. It matters but little how efficient the staff may be, an unsympathetic judge, thinking more of legal enactments than prescribing for human weaknesses, can change the entire principle and purpose for which the Juvenile Court was established to express.

Fortunate, indeed, are the points of Montreal to have one of such mature wisdom, patience and judgment to arbitrate the painful problems arising between the public the parents and the most cherished possessions, their children.

The Juvenile Court of this city, in spite of many handicaps, stands as high as any on this continent; we are not vainglorious or satisfied. We haves tudied and know our problems, and our weaknesses; with money and time we hope to reach a higher state of efficiency recognizing that time alone, with the great university of life as our teacher can inspire and lead us on to higher and greater achievements for the common good.

# A Municipal Pawnshop and its Part in the Great War

**As showing something of the human side of war — the magnificent patriotism and love of those left behind in the face of adversity and the part that a municipal pawnshop plays in alleviating the distress caused by the great tragedy, the following splendid article by John N. Raphael, taken from the London Daily Telegraph is illuminating. —Ed.**

Parisians call the municipal pawnshop "The Mountain of Piety" officially, and unofficially, affectionately almost, they call it "Ma Tante"—Auntie. The affection is well merited. The municipal pawnshop of Paris, which has branches all over the city, does not hide shamefacedly up back streets or in lonely corners. It welcomes everybody, great or small, in need of much or of little money. It lends large or small sums at a fair rate of interest, on everything or anything; in this time of stress and trouble it is a very real help, and no Parisian is at all ashamed of calling upon "Auntie."

A woman and a wounded soldier were talking, anxiously, eagerly, and excitedly, in a corner of the courtyard. There was a bundle in a perambulator beside them. The man in his faded, war-stained uniform had brought the bundle to Auntie's door, but he did not want to go in. He was giving his last instructions to his wife, how much to ask, how little to take, and the woman was trying her best to be brave. "We shall get it out when I come back," he said, and patted her shoulder. As the door closed behind her he looked at his bandaged arm and shook his head. I offered him a cigarette. "Thank you," he said, "all the same, but I dare not begin smoking again — just yet. Tobacco runs away with so much money." I gave him all my cigarettes. "It will be all right when she comes out again," I said. He laughed and nodded, as he took them —"Yes, and my arm is nearly well again—and then——" said he.

It was a Saturday afternoon, and Saturday is a day on which "Auntie" shows her bright r side. For Sundays follow every Saturday even in war time, and on Saturday afternoons Parisians who have been forced to have recourse to "Auntie's" help make shift to withdraw many things as soon as they have received their week's wages. So the degagements counter was crowded, and there was happiness on the faces of the waiting crowd, which sat expectant on the benches opposite. "Le 23" called a little old man in a skull cap. A young man, a boy almost, took his number and his money to the desk. He got another number, and as he danced off into the next room to wait for his bicycle, "I shall put it in again on Monday," he said to the room at large. "I shall not want it again after Monday, till the war is over. "Je pars, moi, la semaine prochaine!"

### Human Side of War.

In the next room, where the redeemed articles were delivered, a little woman was struggling with a big bundle. It was bedding, and an old man waiting for his own parcel helped her to tie it into a black cloth. "My husband has a fortnight's convalescant leave, and he comes home tomorrow," she murmured, as she thanked him. "He would have missed his bed, and I am glad to have it."

But it is the Salle des Engagements, the room where things are pawned, that the Mont de Piete contains the real essence of the human side of war, comedy and tragedy both. There is not very much comedy, but here at the end of a bench near the door are two midinettes in fits of laughter. The one evidently came to keep the other company, and they had brought a clock to pawn. It was a very ugly clock, a black marble contraption adorned with gilt warriors and leaves. "What is the use of a clock?" said its owner, defiantly. "Is not the time long enough like that?" "Oh," said the other, "he will soon be home again." "He has promised to bring me a Boche helmet if he can," laughed her friend. Then her number was called, the clock travelled up to the counter, and disappeared into the mysterious inner room behind the screen where the valuing is done. "Et alors?" said the girl. "Your number will be called, and, at the same time, the amount we are prepared to give," said the clerk at the counter. She went and sat down again. Her friend remarked, "Let us hope they will pay for it by weight." Presently from the room of mystery a voice was heard: "Le numero deux cent soixante-quinze, treize francs cinquante." "Ah, non!" said the girl indignantly. "It is a hot day, and I have no money to pay for a taxi, I!" "Fifteen francs," said the voice, for even chez Ma Tante bargaining is not unusual. "Bien," said the girl, and went up to the cash desk for her money. "I shall send him tobacco, a five-franc note, and a bottle of iodine," she said to her friend as she took it. "And I," said the other girl, "will send him a box of sardines and a lock of your hair."

The pale woman in deep mourning had a child with her. There were only two men in the room, and nearly every woman had one or more children. One, obviously a grandmother, had four, and one little girl clutched a shabby doll. "You won't give him my dolly, gra'mere?" the child kept on saying, "you won't give Anne-Marie to the gentleman?" "But, no, my little foolish one, no," said the old lady, and patted the square parcel which was on the seat beside her. "These will be quite enough. Papa does not want them while he is at the war, and we will get them for him again before he comes back." And the old woman sighed. One wondered what "these" were. Some of them were clothes, undoubtedly, and the box was not heavy. The old woman and the children, hatless and aproned, all of them, were very evidently poor, and very, very neat. The pale woman in mourning had two old p stols, a sword, and a picture in a heavy gold frame. "Can you take the picture out, and let me leave the frame only?" she whispered. "Mais parfaitement, Madame," said the kindly old man at the counter. "It is a good frame." There was some whispering in the room of mystery behind. A face peeped out and was withdrawn. "Have you, perhaps, anything else, Madam?" said the old clerk, coming back. The woman fumbled in her dress, while everybody made a point of looking away discreetly. She slipped a thin gold chain off her neck, pushed it across the counter, and whispered brokenly, "The medal is of silver." There was more murmuring of voices in the room behind. The old clerk came out with a number, and I am certain he patted the woman's hand as he gave it to her. Presently the voice from the valuing-room called, "Le numero 293. Quatre-vingt-dix francs!" "Ah, merci, Monsieur," said the woman in black. "You can release any part of them when you wish," said the cashier as he handed her the money. She nodded, wiped her eyes and hurried out. "The wife of an officer," whispered my neighbor.

### Secret and Sweet Charity.

One of the two men in the room was an Italian. Everyone had, of course, to show his papers. He produced his mobilization order. "I want to pay my rent before I go—in case," he said in broken French. And then another woman, in black, came to the counter. Two little children tugged at her shabby dress. There was no crepe on it, but it was black, and very, very worn and shabby. The children were in black, both of them, and the poor woman's face wore its mourning quite plainly. "Eh bien, Madame," said the old clerk, not unkindly, but briskly, for she stood at the counter without speaking a word, and the other man present, a well-to-do-looking, white-haired, white-bearded old boy, in good clothes, was, apparently, waiting. "Eh bien, Madame?" The woman looked about her, furtively almost. The old man behind her understood — it is wonderful how people do understand just now — turned and examined a poster on the wall opposite. The woman seemed to be wringing her hands. "For these little ones," she muttered, and slipped a worn wedding-ring over to the clerk. She did not leave the counter when the ring was taken in, but stood looking at her hand as though she had hurt it, as well as her heart.

The room was nearly empty now. "Madame," the prosperous-looking old man said, "my two sons are at the war. Keep your ring. Say "Non" when they make you their offer. Borrow this money from me instead. See, here is my dead wife's ring on my chain. I wear it always. She might have been the grandmother of these two little ones. There is no shame. See——" "Dix-neuf francs!" said the old man firmly. And the poor woman looked at him so gratefully, but could not speak. He slipped a bank note into her hand, took the ring from the clerk, and gave it back to her, and "Here is my card," he said. "You shall pay me when you can." I don't know whether he had come to "Auntie" for business or for charity. There is much charity by stealth in Paris nowadays. He pawned nothing, but hurried off. The woman remained in the middle of the room for an appreciable moment. Then she kissed both the children. Then she slipped the worn ring on her finger again and kissed that. She looked at the banknote, and at the card in her hand. The note was £2—50f. She turned the card over and over. There was neither address nor name on it. It was quite blank. "Monsieur!" she called aloud, and sobbed. "But I cannot —— Monsieur!"

# Progress in Canada's Roads

GEORGE A. McNAMEE,
Secretary, Good Roads Congress.

Substantial and constant progress in the improvement of Canada's roads and streets is shown by the brief summaries received from the road departments of the various Provinces by Mr. George A. McNamee, secretary of the "Good Roads" Congress, which meets at Montreal, March 6th to 10th inclusive.

From the communications already to hand it is possible to give the outline of what has been done and is being done by two of the Maritime Provinces: New Brunswick and Prince Edward Island, the two old Central Provinces; Quebec and Ontario, and two of the Prairie Provinces, Saskatchewan and Alberta.

**New Brunswick:** A separate department for roads has lately been created, with Mr. John L. Feeney in charge, and a definite policy of road construction is being formulated. Last year the Province subsidized its roads, and will again do so this year.

**Prince Edward Island:** (Almost an agricultural Province). The earth roads are largely repaired and improved each year. The mileage is approximately 3,500 miles. Repairs are made by district road taxes, supplemented by Legislative allowances for larger works. The road taxes for 1914 amounted to $36,000, and the Legislative allowance was $18,000 for roads, and $35,000 for permanent bridges.

**Quebec:** Rapid strides have been made in the last half-dozen years, 295 miles of water-bound macadam and 140 miles of gravelled roads were built in 1915 by the Government as Provincial roads, or by Municipalities with Government assistance, at a total cost of nearly $3,000,000. The Sherbrooke-Derby Line Road, 32 miles, is complete; there remain only 14 miles to be done on the Levis-Jackman Road, and of 32 miles of uncompleted road in the Montreal-Quebec Road, foundation has been laid for 21 miles. These roads are expected to be finished this year. From 17,000 to 18,000 miles of earth, gravelled or macadam roads are regularly maintained by Municipal Councils, 476 municipalities having by-laws in force for road maintenance. During the past few years Quebec has expended over $14,000,000 on its roads, out of $15,000,000 appropriated, and an authoritative rumour states that $4,000,000 will most likely be appropriated during the present session of the Legislature, this, together with the balance of appropriation on hand, makes $5,000,000 for roads in Quebec. Several provincial roads asked for by different districts are receiving the Governments' serious consideration.

**Ontario:** Twenty miles of the Toronto-Hamilton concrete highway was completed in 1915, leaving about 16 miles to complete. The total cost will be about $850,000, the Provincial subsidy being $4,000 per mile. The construction of a main highway from Toronto to Oshawa, about 26 miles, and from Ottawa to Prescott, about 60 miles, at a cost of $600,000, are the principal main roads under consideration. In addition to these projects for main roads which will ultimately form sections of national highways, there was constructed in 1915 approximately 250 miles of county roads at a cost of $658,000, of which the Province paid one-third. The Provincial appropriation of $2,000,000 for county aid is exhausted, but a further appropriation is expected at the coming Session of the Legislature. The Ontario Government will proclaim the Highways Bill to take effect this month. Instead of 30 per cent, the Government will pay 40 per cent of construction cost, and 20 per cent of maintenance cost, instead of nothing as heretofore. The increased revenue from motor licenses will be devoted to defraying the additional charges on the Provincial Revenue.

**Saskatchewan:** The Saskatchewan Legislature voted the following amounts for road purposes for the fiscal year ending April 30th, 1916: to be expended from income, on roads and bridges, $500,000; to be expended from capital, on steel bridges with concrete foundations, $300,000; to be expended from capital, for Highway construction, $1,200,000. Owing to financial conditions arising from the war, however, it was decided to restrict the expenditures, and the amounts spent under the above three heads are respectively $170,000; $168,000, and $328,000. The Province has not yet started the construction of hard metal roadways, the work consisting mainly of making passable the dirt roads.

**Alberta:** Since its formation as a Province in 1905, Alberta has been spending $500,000 annually out of revenue upon its roads, in conjunction with the municipal organizations, and where there are no municipal organizations, the expenditure is made directly through the Public Works Department. As the Province, like Saskatchewan, is a new one, no highways have yet been set aside for construction with permanent material, the problem so far having been largely one of assisting the settler to get from his homestead to his nearest railway point.

In this brief survey of the Provinces, there are lacking Nova Scotia, where considerable road work is being done; Manitoba, which is considerably in advance of Alberta and Saskatchewan, as being an older province; and British Columbia, which is one of the most forward of all in its road policy and actual accomplishments. When these are added to the provinces treated of, it will be apparent that Canada has made a decisive and encouraging start toward the goal of Dominion-wide Good Roads.

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## ONTARIO HIGHWAYS ACT.

The Ontario Highways Act passed at last session of the Legislature, came into force during January, and a Public Highways Department has been established.

Hon. F. G. MacDiarmid is now Minister of Public Works and Highways, and W. A. McLean, C. E., is Deputy Minister of Highways.

The Ontario Highways Act provides:

1. For Provincial aid to the extent of twenty per cent of the cost of maintaining County Roads.

2. For encouraging townships to appoint a township overseer or foreman by paying twenty-five per cent of his salary.

3. For the appointment of commissioners to designate and define the suburban roads towards which cities and separate towns may be required to contribute.

4. For the improvement of connecting links of main or country roads through villages.

5. For the construction of main roads when three-fourths of the municipalities interested petition therefor and for the appointment of a Board of Trustees to take charge of the construction and maintenance thereof, the Province to pay forty per cent of cost up to $4,000 per mile.

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## TORONTO'S PARKS.

Toronto's park area is now 1,861 acres. High Park, with 335 acres, is the largest, and the Island comes next with 330. The boulevard mileage as planned is 43.33 miles, and 1.80 has been constructed. Ravine driveways planned have a mileage of 6.38, and there have been partially constructed 7.27 miles.

# The Immigrant Invasion after the War---Are we ready for it?

By J. S. WOODSWORTH.

The phrase "immigrant invasion" is no scare headline. So far as numbers go, the future of Canada lies not with the native-born Canadians, but with our immigrants—possibly with our foreign immigrants.

At this time in the discussion of all subjects there is only one starting place—the world war. With every important topic two questions present themselves: "What is the relation of this to the War?" and "After the war, what?'

This war has clearly revealed to us what we had only begun to suspect—that we had in our midst large numbers of undigested aliens who might at any time cause a serious disturbance within our body politic. At election times we had begun to hear of the German vote or the Ruthenian vote, but we had put aside the whole question as merely a matter of party warfare or election pyrotechnics.

But now that registration of aliens is considered necessary, now that many Germans and Austrians in Canada are under guard, now that the mayors of some cities are apprehensive of foreign outbreaks—now we begin to realize the seriousness of our problem.

The danger now to be guarded against is that a sudden panic may lead us to take extreme positions and thus intensify and perpetuate racial bitterness and animosities. Every consideration should be given to our "Alien enemies" resident in our midst. Many are anxious to return home, not to enlist, but to join and assist their parents and wives and children, who, they realize, are in a deplorable condition.

Further, it is worthy of note that had another alignment of the nations taken place the situation in Canada might have proved extremely awkward.

The fact is that the Canadian unification is still far from complete, and the introduction of foreign elements is making the process extremely complicated and difficult.

What of immigration after the war? At this stage it would be of little advantage to indulge in speculation as to the outcome. If the Allies should be defeated—for most of us such a contingency is unthinkable—our fate would probably be bound up with that of the United States.

If the Allies win, much will depend upon the terms of settlement, and the nature of the indemnity. Probably England will enjoy a period of rapid trade expansion that will lessen the over-seas migration. There is a general impression that many of the farmers of Belgium and France may have no heart to return to their devastated homes, but will prefer to start anew in the friendly new land of Canada. Possibly though, on the other hand, the male population will be so reduced and the whole land so impoverished that it will be absolutely necessary to retain every available man to rebuild the waste places.

Germany, from which in recent years we have had few immigrants, will undoubtedly need to conserve her resources, and Poland may again become an independent Kingdom, in which case, instead of sending forth her best she will rather call her sons from afar to return and build up something of the former glory.

From the frontiers of Austria and Russia, from the fragments of older nations, from dispoiled fields and war-ravaged villages, from communities struggling under the burden of heavy war taxes, will doubtless come larger and yet larger armies of immigrants.

This movement of the peoples from South Eastern Europe has during the last quarter of a century been slowly gathering momentum. First it was directed towards the United States. As the returned immigrants carried back the news of wider opportunities in the new land, the thoughts of men more and more turned Westward. Then came the enactment by the United States of stricter immigration laws. This did not stop the stream, but helped to direct it into more northerly channels—Canada welcomed the on-coming hosts.

While admittedly the question is exceedingly complicated, and it is impossible to determine accurately what the resultant effect of the war will be, it appears altogether probable that the war will accelerate rather than retard this world movement of the people.

In support of this conclusion two general considerations may be urged—first, war tends to break down national and social barriers, to loosen old associations and to enlarge our little world; second, this war will change the whole economic map of Europe and of the world. Trade currents will take entirely new directions. The precise effects no one can prophesy, but on the whole Canada—a new country, largely as yet undeveloped, and with unlimited natural resources, stands to gain.

Are we ready for more immigrants? Even without a greatly augmented increase our problem is a serious one. As yet no constructive policy has been adopted for dealing with it in any adequate way.

Our Immigration Department has made excellent arrangements for the care of immigrants during their journey, has provided for their comfort at points of transfer, has even helped them financially until they obtain a foothold, then we have left them largely to shift for themselves. The theory has been that once the immigrants landed home safely, our existing institutions were sufficient to the task of caring for them. But this theory has proven entirely untenable.

More far-reaching measures are absolutely necessary. Our industrial system, our educational system, our political system, must be decidedly modified to meet the new needs.

Let me present the results of some statistical studies:

Canada's population in 1901 was 5,371,315; of this 57 per cent, or 3,630,195, was British.

The immigration from July 1st, 1900, to March 31st, 1914, was 2,906,022.

The total immigration from 1913 to 1914 was 384,478, as against 402,432 in 1912-1913, or a decrease of 4.46 per cent.

The British immigration was 142,622, as against 150,542, or a decrease of 5.26 per cent.

Immigration from the United States was 107,530, as against previous years 139,000, or a increase of 19.35 per cent.

From other countries the immigration was 134,726, as against previous year 112,861, or an increase of 19.35 per cent.

You will notice that whilst there was a decrease in the immigration both from Great Britain and the United States, there was an increase in our non-English immigration.

While we superficially class all these peoples as foreigners, we must remember that in reality each is a foreigner to all the others. The French, for instance, have very little in common with the Germans, the Germans with the Russians, the Russians with the Jews. The Canadians are the amalgam which must bind together these diverse peoples.

**My question is, mix these peoples together, and what is the outcome.**

From the racial standpoint it is evident that we will no longer be British, probably no longer Anglo-Saxon.

From the standpoint of eugenics it is not at all clear that the highest results are to be obtained through the indiscriminate mixing of all sorts and conditions. But if they do not intermingle and intermarry the situation may be even more serious, as we will then set up more or less of a cast system.

From the religious standpoint, what will be the outcome? For it must be remembered that most of our foreign immigrants do not belong to the churches which are at the present time dominant in Canada.

From the political standpoint it is evident that there will be very great changes, and very serious dangers. The recent civic elections reveal to us the strength of the foreign vote. Never before were national lines so sharply drawn or was there greater bitterness. Whilst it is true that these people are not united, and that the English majority may retain its power by pitting one against the other, at the same time it is also true that such a condition is far from satisfactory, and would inevitably result in placing any party at the mercy of any leading nationality, thus practically giving that nationality the balance of power. Unfortunately already these foreigners have been corrupted. At a recent election a non-English friend of mine invited a fellow-countryman to come with him to the polls. The man replied, "Oh, no, Me no voted. Me no drink." What was the use of his voting? Such is the prevalent idea of the franchise.

From the social standpoint, we must remember that each nationality brings with it its own social customs and ideals. Which will prevail?

(To be Continued.)

# Municipal Affairs in British Columbia

(By JACK LOUTET.)

### Proposal to Guarantee Private Company.

The City of North Vancouver has at present before it a proposal that it should guarantee the 35 year bonds of the Amalgamated Drydock and Engineering Company to the extent of $750,000, and provide free water and exemption from taxation for a like period. Under the Municipal Act ten years is the limit allowed for freedom from taxes, but this difficulty might be overcome. General opinion in North Vancouver supports the proposals in regard to water and taxes, but on the guarantee of bonds is divided. A majority of the City Council has de ided 'o place an agreement embodying the guarantee before the electorate, but it is stated that this is subject to a satisfactory agreement being drawn up. The Drydock Company has applied for the usual interest subsidy from the government and it is understood has secured this conditionally. Rumors have spread that unless the city guarantee was forthcoming the drydock would be located elsewhere, but the name of the municipality offering better inducements has not been revealed. The Public Works Department, on being appealed to, telegraphed that good reasons would have to be given for any change in plans.

The amount of capital possessed by the company has not yet been revealed, and the impression prevails that bond proceeds would finance the whole undertaking, an unsatisfactory feature from the city's point of view. Arrangements are alleged to have been made for a Vancouver company, the Pacific Construction Co. to undertake the work of construction but on what terms is unknown.

The latest development is the question as to whether the city should negotiate with the Drydock company or the construction company, and arising out of this the negotiations may be dropped entirely. The whole scheme appears to be somewhat nebulous at present and North Vancouver is likely to make haste slowly before further mortgaging the city. The statement freely made that the guarantee is of principal only, and that the present generation will not be called upon to pay it, is a dangerous argument and should not be allowed to have any weight when a decision has to be made. The credit of the city would undoubtedly be affected and future borrowing made very difficult and expensive. The site proposed for the drydock and works is on Burrard Inlet west on the Indian Mission.

The Vancouver Creosoting Company, a new concern, said to be connected with a similar large concern near Seattle is locating on Burrard Inlet in the District of North Vancouver.

This municipality proposes to give water at cost and freedom from taxation for ten years. The company expects to commence operation in May or possibly sooner and will employ from forty to one hundred men, the latter when the complete plant is in operation.

### Tax Sales.

It is rumored that the Provincial Government does not intend to pass legislation along the lines proposed by the U. B. C. M. in connection with Tax Scale certificates, but may probably allow borrowing against arrears of Taxes to the extent of 50 per cent by means of certificates secured by hypothecation of the arrears. Certificates would be retired in rotation as the arrears are collected or drawings held quarterly to determine those to be retired. The former system is favored as it enables parties to choose a long or short term investment and would also enable underwriters to retain the low numbers until the others were sold and thus ensure a quick return on the unsold certificates.

Extraordinary weather has prevailed during the past two months in British Columbia and late in January and early in February severe snowstorms made matters difficult in most municipalities on the coast. Victoria was particularly hard hit, the tramways being completely blocked and traffic being seriously handicapped for several days. No serious damage resulted, but the removal of the snow proved an expensive matter. The B. C. Electric Railway Company by strenuous exertions with excellent equipment maintained their schedule in Vancouver and surrounding municipalities, while the jitneys were compelled to cease operation.

In West Vancouver a section of the line of the Pacific Great Eastern Railway Co., which there operates gasoline cars was washed out by the heavy seas and will take some little time to replace.

North of Squamish at the summit twenty-eight feet of snow had fallen and the railway had to cease operations, no rotary ploughs being available.

### Taxation of War Profits.

The City of Prince Rupert is leading the way by circularizing all municipalities of B. C. on the question of taxation of war profits. There is undoubtedly a strong feeling throughout the West on this subject. The heavy drain of men and money from a Province which has had little benefit from war orders is keenly felt and only the deep-rooted patriotism of the people prevents stronger expressions of disgust with the manner in which political considerations appear to be interfering with the proper conduct of the war and a fair distribution of the burden. Many municipalities have already expressed themselves in favor of taxation of war profits along the lines adopted by the Imperial parliament and protests have been made against the recent action of the government in refusing to contribute towards the cost of feeding families of interned aliens unless such families reside in the internment camp. In the case of wives and young children of alien enemies it is contended that the police exercise all necessary supervision and in some cases the wives are British born and would be very uncomfortable if interned with German-born women.

Another trouble has been the failure of the government to intern adult alien enemies who openly express themselves as favorable to the Teutonic allies.

It is even alleged that suspected persons have been granted commissions in the army.

Lumber mills on the coast are very busy, but the shortage of logs consequent on the severe weather is preventing as large an output as would otherwise be possible.

Prices of lumber are on the up-grade and orders have been booked which will keep the mills busy for some time.

Unemployment is now approaching normal and the various municipalities have less distress to cope with than last winter. Many municipalities will experience considerable difficulty in financing even the moderate programmes now before them.

By-law balances were largely used up last year and to carry along on income alone with but 40 per cent likely to be collected is a serious problem. Tax sales will produce little or nothing as the difficulties placed in the way of registration of tax sale deeds make the costs excessive while conferring no benefit on anyone.

In some cases buyers have refused to register and the property will have no owner until possibly another tax sale will put the property in the hands of the municipality.

Personal service on all parties interested is demanded, this including judgment creditors of deed holder, agreement holder or sub-agreement holder, and in many cases these cannot be found. Many municipalities have found that they cannot finance the registration of their tax sale deeds and until they can they have neither taxes from the property nor can they sell it.

This condition will be placed strongly before the government at the next session of the legislature.

A. J. LATORNELL, B.A., Sc.

City Engineer, Edmonton, Alta., who has resigned his position to train for Canada's Overseas Forces.

# Good Roads

(R. O. Wynne Roberts, C.E.)

So much has been written and said on the subject of good roads that it would seem difficult to discern a new phase of the topic, but it is almost like a perennial spring yielding up a flow which furnishes power for renewed activities.

Although there may be extensive mileage of railways of various kinds and other means of transportation in a country, good roads, after all, constitute the primary arteries by which its economic and social development and prosperity can be established. Every cent saved in the cost of transporting goods means adding to the wealth of the community and this is reflected in the manner of living. This becomes apparent when a comparison is made between countries in possession of good roads, and those where they are less general. Or the contrast, perhaps, is more vividly exemplified when we consider a district where good roads have supplanted bad ones. As an extreme case, the writer can refer to one where in former years the farmers took three days to negotiate a mountain pass, causing untold cruelty to the cattle and hardships on the men, but to-day it is possible to reach the same destination in about four hours by travelling along fairly level roads traversing romantic valleys and crossing turbulent streams which run through between the steep and rocky mountains. It requires no argument or statistics to convince the people in that district as to the value of good roads. Take another. Years ago the only route for farmers, travellers and explorers to take from one part of a country to another was over a wild, sandy flat. So bad was this route that the farmers had to erect poles to direct their way, just in the same manner as sailors have buoys in a turbulous shifting channel. The wind drifted the sand and obliterated the track. It took two days to make thirty miles, but to-day the same parts form a pleasure route for automobiles and the main road between important districts. The gumbo-clay roads of Western Canada and the Central States in wet weather are often as bad as roads can be, unless attention is paid to surface grading and dragging. The efforts made by the authorities to improve them are persistent and when the problem is tackled in the right manner there is no doubt that these roads are capable of great improvement. The experience of travelling along a badly maintained gumbo-clay road in wet weather is not easily forgotten; and the contrast between such and those which are carefully maintained is great. The farmers who live in the gumbo-clay area are encouraged to drag the roads adjoining their land and thereby keep them in good order; but, although the expense is relatively small, it is difficult to induce them to perform the work. His duty should devolve on the road authority and the burden should be carried by all. This is being done in some districts, but it is not yet general, although the relief in transportation in wet weather especially is manifest. Road construction and maintenance is obviously a communal or state duty. Napoleon perceived this fact generations ago, and France obtained her great system of highways. The Romans recognized this fact nearly 2,000 years ago, and since the initiation of the Good Roads Movement the idea has spread world-wide.

### Binding Materials.

The interest which is taken in good roads is remarkable. The great conventions held in Brussels, Paris and London were attended by delegates from almost every country, and great things have been achieved. The development of the automobile has contributed much to the improvement of existing roads and the construction of new ones, inasmuch as that vehicle has become immensely popular and useful. The automobile has created a demand for superior roads, for the employment of efficient and experienced engineers, and for the use of materials to allay the dust and preserve the surface against the disintegrating forces caused by the increased and more rapid traffic. Water bound roads were never entirely satisfactory, for in frosty weather they were frost-bitten and when thawed became saggy and treacherous. In dry weather they disintegrated because the dust which bound the macadam together was loosened and blown away. The rubber tyres of automobiles raised the fine stone by adhesion, and the same was thrown off again by centifugal force. Consequently a better binding material was sought. France was early in the field in the use of coal-tar, as a dust abater and surface binder, although British engineers had employed tar for road construction a generation or so previous. The use of tar, however, was not uniformly satisfactory because coal-tar varies in quality and attributes, according to the process by which it is produced, and whether it is dehydrated, partially distilled or otherwise treated. The writer contributed slightly to the knowledge on this matter as his experience in gas engineering, tar distillation and tar macadam works suggested that it was necessary to extract certain element before tar was fairly uniform in character. Coal tar is not obtainable in all parts consequently recourse had to be made to other bituminous binders and to-day we have a goodly list of them for use. Moreover, careful researches have been made into the essential characteristics of good road bituminous road binders. Britain has abundant supply of tar and therefore concentrated on its improvement, whilst the United States, having to depend largely upon other bituminous materials, made investigations as to their most satisfactory compositions.

Apart from the construction and maintenance of suburban and country roads, the question of better city pavements has also received attention, although it is possible that the progress has not been quite as spectacular. Bituminous mixtures and sheet asphalt paving are largely used. P. C. concrete is employed on certain interurban roads, and brick pavements have been laid. Investigations have been made respecting the use of Canadian lumber for wood paving, but in many places there is a prejudice against wood block paving owing to the unsatisfactory experience gained. This is exceedingly unfortunate because there is no tangible reason why a lucrative industry could not be built up in Canada, where timber is so plentiful. In Australia, hardwoods have been used and these were for many years tried in Britain, but British engineers have returned to creosoted soft wood. It would seem possible that Canadian lumber could be used for wood block paving provided creosote of a proper quality was used, and the blocks were thoroughly impregnated and the surplus oil exhausted. Wood block paving have caused considerable trouble in the States, presumably because the creosote was not of the right composition and probably because the surplus oil bled and caused a nuisance. Nevertheless, there is room for the development of a Canadian wood block paving industry. There is another pavement which also could be developed. Sett pavements are laid but the blocks are irregular in size, nodular in shape, and not carefully laid. Cube blocks make a fine pavement as can be seen in Manchester and elsewhere. There doubtless are suitable quarries in Canada for the manufacture of gauged stone setts. Lastly, the Duvax stone paving, which consists of stone setts of small size laid carved or plain, make a good pavement for light traffic.

The subject of good roads has become very great and important and deserves careful consideration by all who desire to see the country develop.

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### RECORD HANDLING OF GRAIN.

The Grand Trunk Pacific Elevator at Fort William, Ont., has established a wonderful record for the handling of grain, during the past season, one that has never been equalled at that port of big records and marvellous achievements in moving grain. The following figures are interesting and expressive:

| | |
|---|---|
| Unloaded from cars between Oct. 1 to Dec. 23, bushels | 21,994,000 |
| Or, cars | 18,500 |
| Average per working day of 12½ hours, cars | 241 |
| Loaded into boats in October, bus. | 5,600,000 |
| Loaded into boats in November, bus. | 8,987,000 |
| Daily average loading, bus. | 300,000 |
| Loaded into boats between Dec. 1 and 12, bus. | 5,700,000 |
| A daily average of, bus. | 475,000 |
| Loaded in 36 hours ending midnight Nov. 30, an average per hour of, bus. | 42,000 |
| Loaded in 4½ hours one complete cargo, an average of nearly 63,000 bus. per hour, bus. | 283,000 |

# The Maintenance of Roads

When it is a question of comparing a number of different roads from the standpoint of economy, the most rational basis of comparison seems to be that of the "ton mile." It is well understood that this reference is to that part of the cost of the ton mile which belongs exclusively to the character of the roads. Now in the cost of the ton mile the following elements enter:

1st.—The interest of the capital employed in the construction of the road.

2nd.—The annual payments towards the redemption of this capital.

3rd.—The cost of improving the road.

4th.—The cost of maintenance of the permanent portion of the road.

5th.—The cost of maintaining the non-permanent part of the road.

6th.—The maximum grade of the hills. All these elements are necessarily related the one to the other. It is well understood, in fact, that in building a less costly road we can lessen the costs of interest and sinking fund, though at the expense of an increased cost of maintenance, while if an economy is realized by adopting higher grades for the hills the cost of vehicular traction will be proportionately increased.

The problem to solve is evidently to construct the road with the easiest grades possible, at the least possible outlay, and in so utilizing the expenditure that the cost of maintenance of both the permanent and non-permanent portions of the route should be reduced to a minimum.

As is well known, roads are in part permanent and in part non-permanent in character.

The permanent part comprises the earthwork, the culverts, the drainage, the under drainage, the protective works, and then the sub-base and the lower layer of the wearing course, properly so called.

The non-permanent part includes the top course of the road, that is to say, the wearing course itself.

The costs of maintenance should also be divided into two classes; those connected with the permanent part and those connected with the non-permanent part of the road. But attention must be directed to certain works which should not be included in those of maintenance. Such are those of amelioration or of protection which for one reason or another were omitted when the road was made, and which may have become necessary later; as for instance the replacing of old wooden bridges by others of metal or concrete; the protection of the body of the road alongside river, against erosion by means of riprap and the solidification of the side slopes of embankments and cuttings. With these works may also be classed the increasing of the thickness of the sub-base to meet heavier traffic conditions.

In certain cases and in certain localities the soil is dry at the time of construction and the foundation sufficient. Under some conditions it might happen that the action of subterranean waters becomes changed, moistening the ground and rendering it necessary to drain the sub-soil sometimes to increase the thickness of the sub-base.

All these works and others which it would take too long to enumerate, are of a permanent character, and should be considered as permanent improvements. They should not therefore be charged to "cost of maintenance" but to the account of "capital."

To better show the close connection between capital expenditure and costs of maintenance, a frequent illustration may be employed. Take the case of a low-lying road, subject to inundation. The original outlay may be increased by raising the roadbed several feet, for instance, in order to keep it above high water. The additional earth work will cost so much.

Coming to the question of the maintenance of the non-permanent part of the road we find things more complicated.

First of all it is necessary to understand what is the non-permanent part of the road. We may admit that generally speaking it is represented by the wearing course. In the case of asphalt roads there is no ambiguity in the term. It is the bituminous bed, which may be as much as four inches thick. All below it is the foundation. Neither is there ambiguity when the term is applied to brick, concrete or paved roads. It is not the same thing, however, when we come to water-bound macadam. Here we may admit that the upper four inches are forming the top course, all below it will be considered as sub-base. When a macadam top course is worn out two inches for instance, the wear is not regular, depressions show themselves everywhere, and may sink down to a depth of four inches. It then becomes necessary to completely renew the top course by adding a new one.

The first macadams were composed of stones of a uniform size throughout their entire thickness. But the crushers now employed in the building of roads furnish stones of different sizes which have to be used. In utilizing them it is necessary to form the foundation of layers of stone of various sizes.

Only the lower course in contact with the soil, formed of the largest stones, and often unbroken, is generally considered as sub-base. The macadam properly so-called, which is placed above, is generally composed of two courses separately laid. However that which is in contact with the sub-base should also be considered as forming part of it, for it is rarely reached by the wheels of vehicles.

There are two methods of maintaining roads in good repair,—that by means of patrolmen who make patch-work repairs as they become necessary, and that of general recharging.

By the first method, the defects of wear are eliminated as soon as they make their appearance.

By the second method, the wearing course is left to the effects of wear and tear for a certain number of years and is then removed.

When the two methods are employed together the life of a wearing course may be prolonged, and the annuity consequently diminished, but at the same time the expenses of the patrolmen are increased.

It is often asked in what proportions the two methods should be employed. There does not yet appear to be any general reply to give to this question. Every thing depends on the nature of the wearing course, and the other circumstances of the case.

We find in Europe old macadamized roads dating back many years, in fact, to the middle of the last century, which have been maintained by the patrol system, and which are still as good as when they were constructed. Others have been maintained by the recharging method, with the same success.

Nevertheless it has been recognized in France that even when manual labor was cheap the patrol system was more costly than the other.

Since the epoch above referred to, the use of machines has been considerably extended. In certain States of the American Confederation the maintenance by patrolmen has been recommended, especially in the case of bituminous courses.

These wearing courses, which cost about $6,000 a mile for a width of 166 feet, may last eight, ten, twelve, or more years, according to the quality of the bitumen, that of the stone, and the nature of the traffic.

Suppose that one of these wearing courses lasts ten years. The annuity required in this case will be about $600 a year, if patrolmen are not employed. By employing them, the life of these wearing courses may be prolonged and the annuity consequently diminished, but at the same time it is necessary to add the cost of the patrolmen. It is easily understood that even in prolonging the life of such wearing courses by means of the "patrol-system," it may possibly happen that the sum of the cost of the patrolmen and of the annuity reduced by the prolongation of the wearing course, may be higher than the simple annuity without patrolmen.

The pavements in granite and brick, and the roads in concrete are much more costly, but as they last longer they rather tend to reduce the maintenance annuity.

On the other hand, being more resistant, the works of the maintenance that they necessitate are much reduced, and the patrol system, which indefinitely prolongs their life and consequently reduces their annuity to nothing, apart from the interest, is applicable to them. Generally speaking, with these pavements, the sum of the annuities and of the cost of the patrolmen is less than with other and more inexpensive pavements.

# Third Canadian and International Good Roads Congress and Exhibition

Under the auspices of Dominion Good Roads Association and Canadian Automobile Federation, Sohmer Park, Montreal, P.Q., March 6th, 7th, 8th, 9th and 10th, 1916.

CONGRESS OFFICERS AND EXECUTIVE.

President—B. Michaud, Deputy Minister of Roads, Province of Quebec, Quebec, P.Q.

Vice-President—O. Hezzelwood, President Canadian Automobile Federation, Toronto, Ontario.

Secretary-Treasurer—Geo. A. McNamee, Secretary-Treasurer Dominion Goods Roads Association, New Birks Building, Montreal, P.Q.

W. A. McLean, Honorary President Dominion Good Roads Association, and Deputy Minister of Highways, Province of Ontario, Toronto, Ont.

U. H. Dandurand, Honorary President Dominion Good Roads Association, Montreal, P.Q.

Howard W. Pillow, President Automobile Club of Canada, Montreal, P.Q.

J. Duchastel, Engineer, City of Outremont, P.Q.

J. A. Sanderson, Honorary President Ontario Good Roads Association, Oxford Station, Ont.

GOOD ROADS EXHIBITION.

This the Third GOOD ROADS' EXHIBITION, will be located at SOHMER PARK, wherein will be shown varied and interesting Exhibits of Road Materials, Machinery, Accessories and Equipment, Municipal Improvements, Engineering, Technical and other Magazines, Gov-

MONDAY, MARCH 6th.

10.00 A.M.—Registration of Delegates and visitors at Congress Headquarters, Sohmer Park; registration continuing throughout the Congress.

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**FIRST SESSION.**

2.30 P.M.—Congress called to order by the President, Mr. B. Michaud.

Address: His Grace Archbishop Bruchesi, and His Lordship Bishop Farthing.

Address of welcome on behalf of the Province of Quebec by the Lieutenant-Governor, Hon. P. E. Leblanc.

Address: Sir Lomer Gouin, Premier Province of Quebec; Hon. J. E. Tessier, Minister of Roads, Province of Quebec; Hon. J. E. Caron, Minister of Agriculture, Province of Quebec.

Address of welcome on behalf of the City of Montreal, by Mayor Mederic Martin.

Address of welcome on behalf of the Dominion Good Roads Association, by U. H. Dandurand, Honorary President.

Address: S. L. Squire, President Ontario Good Roads' Association.

Response on behalf of the Congress by W. A. McLean, Honorary President Dominion Good Roads' Association, and Deputy Minister of Highways, Province of Ontario.

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**Tuesday, March 7th.**

**SECOND SESSION.**

Presiding officer—B. Michaud.

9.30 A.M.—Appointment of Committees.

10.00 A.M.—Address: Hon. J. A. Tessier, Minister of Roads, Province of Quebec.

"MACADAM ROAD MAINTENANCE."

Paper: M. Huber, Assc. M. Can. Soc. C.E., Engineer, Ontario Highways Department.

"GRAVEL AND STONE ROADS."

Paper: Gabriel Henry, Chief Engineer of Highways, Province of Quebec, P.Q.

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**THIRD SESSION.**

2.30 P.M.—Presiding officer: U. H. Dandurand.

Address: W. A. McLean. Deputy Minister of Highways, Province of Ontario. "A Tour of European Roads." (Illustrated.)

"THE HOT MIX METHOD OF BITUMINOUS CONSTRUCTION USING AN ASPHALTIC BINDER."

Paper: Francis P. Smith, Consulting Engineer, New York City.

"THE HANDLING AND CARE OF ROAD MACHINERY."

Paper: E. Fafard, Superintendent, Plants Branch, Highways Department, Province of Quebec.

"MATERIALS AND METHODS FOR THE MAINTENANCE OF MACADAM ROADS."

Paper: W. H. Connell, Chief, Bureau of Highways, City of Philadelphia, Pa.

"THE COST OF MAINTAINING NEW YORK STATE'S HIGHWAYS."

Paper: F. W. Sarr, Deputy Highway Commissioner New York State, Albany, N.Y.

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**Wednesday, March 8th.**

**FOURTH SESSION.**

Presiding officer: O. Hezzelwood.

10.00 A.M.—Address: Elmer Thompson, Secretary Automobile Clug of America, "Motor Traffic, its Trend and Effect."

Address: A. C. Emmett, Secretary Winnipeg Autumobile Club, "The Legislative Aspect Regarding Road Construction."

... "PROVINCIAL AID FOR ROAD BUILDING."

Paper: J. W. Levesque, M.L.A., Laval County.

"BRICK PAVEMENTS."

Paper: J. Duchastel de Montrouge, City Engineer, Outremont, P.Q.

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**FIFTH SESSION.**

Presiding officer: H. W. Pillow.

2.00 P.M.—Address: Thomas L. Church, K.C., President of Union of Canadian Municipalities, Mayor City of Toronto, Ont., "The Value of Good Roads to Cities and Towns."

Address: O. Hezzelwood, President Canadian Autumobile Federation.

"HIGHWAY BRIDGES AND CULVERTS."

Paper: Geo. Hogarth, Assc. M. Can. Soc., C.E. Chief Engineer Highway Department, Province of Ontario.

"HIGHWAY CULVERTS."

Paper—Alex. Fraser, Engineer, Highway Department, Province of Quebec.

8.00 P.M.—Annual Meeting Canadian Autumobile Federation, Place Viger Hotel.

8.00 P.M.—Sohmer Park. Illustrated Lecture on Tarvia Roads and Streets, by P. P. Sharples, of the Peterson Mfg. Company.

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**Thursday, March 9th.**

**SIXTH SESSION.**

Presiding officer: Col. W. D. Sohier.

10.00 A.M.—Adress.

"ROAD DRAINAGE AND FOUNDATIONS."

Paper: Major W. W. Crosby, C.E., Consulting Engineer, Baltimore, Md.

"CONCRETE HIGHWAYS AND STREETS. ... ...

Paper: Percy H. Wilson, M.A.C.E., Consulting Engineer, Philadelphia, Pa.

**SEVENTH SESSION.**

Presiding officer: J. Duchastel de Montrouge.

2.30 P.M.—Address:

"CREOSOTED WOOD BLOCK PAVEMENTS."

Paper: Andrew F. McCallum, City Engineer, Hamilton, Ont.

"SELECTION OF PAVEMENTS AS GOVERNED BY THE VOLUME ANO CLASS OF TRAFFIC."

Paper: Colonel W. D. Sohier, Chairman, Massachusetts Highway Commission, Boston, Mass.

"PENETRATION METHODS WITH REFINED TARS."

Paper: A. W. Dean, Chief Engineer, Massachusetts Highway Commission, Boston, Mass.

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**Friday, March 10th.**

**EIGHTH SESSION.**

Presiding officer: B. Michaud.

10.00 A.M.—Address: Dr. E. Merrill Desauliniers, M.L.A., Chambly County. "Legislation on Roads Before Confederation."

"RECENT DEVELOPEMENTS IN THE CONSTRUCTION OF BITUMINOUS MACADAM AND BITUMINOUS CONCRETE PAVEMENTS.

Paper: Arthur H. Blanchard, M. Can. Soc. C.E. Professor in Charge of Graduate Course in Highway Engineering, Columbia University, and Consulting Engineer, New York City, N.Y.

# Highway Development in Canada During the Past Decade

(W. A. McLEAN, C.E., Deputy Minister Highways, Ontario.)

The improvement of public highways has, throughout Canada, made very substantial progress; not merely in actual construction, but in the attitude of the average citizen toward the question. Some work of a very notable character has been produced, considerable expenditure has been involved, and better organization has been created; but perhaps most encouraging of all, public interest in the question has been aroused to a remarkable degree such as augurs much for the immediate future.

The development of roads in Canada, in essential principles, has followed the history of all other countries in this regard; and the student of the question cannot but be struck by the similarity which has existed in all countries of the world. Canada has had:

(1) A period of toll roads prior to 1850.

(2) A period of railroad construction when the common road was neglected, but which has resulted in the construction of 32,000 miles of steam railway with a capitalization of $2,000,000,000, including three transcontinental trunk lines.

(3) A period of bicycle influence and agitation commencing about 1890, when educational measures and some better road organization were inaugurated and

(4) Commencing about 1915, a period of motor vehicle influence, which has finally awakened the cities to the cause of good roads as a measure of national development and prosperity — the cost to be borne not by half or quarter of the community, those residing on the farms, but by every one receiving the benefits and carrying the responsibilities of citizenship.

This is the story which might be told of the United States, England or France, with variety of detail according to local conditions. Just as there has been difference of detail between the States of Massachusetts, of Maine and of Dakota — so have local circumstances influenced the progress and results of organization in the Canadian provinces.

Roads in nearly all countries fall naturally into a threefold classification. There are:

(1) The main roads between towns and cities;

(2) Leading farm roads, radiating from market centres and shipping points, and,

(3) Local feeders, each carrying only the traffic which originates on itself.

The natural features of any country have been very largely, a controlling factor as to which of these classes of roads has received first or chief attention, and for which organization has been created.

It is to be observed that no two provinces have the same organization for municipal, provincial or other road organizations. The same is true of the various American States and of all countries in the world. This great variety of organization is due to the variety of local circumstances which have influenced the general trend of public feeling, action and administration on which road organization is based.

### British Columbia.

Thus the mountainous character of British Columbia has prevented uniform municipal organization such as is possible in the prairie provinces. The French code and French characteristics of Quebec have made a striking difference as compared with Ontario, while Prince Edward Island and Nova Scotia have special characteristics in their road situation.

During the past decade the Province of British Columbia has made very remarkable progress in road construction, which has been carried on very largely by the Provincial Department of Public Works. Provincial estimates for roads and bridges in 1901 amounted to $344,000; in 1915 the estimates amounted to $2,459,000. A special programme was provided in 1910 with an estimated outlay of about $20,000,000, the greater part of which has been spent in the construction of main roads of excellent type.

### Alberta.

In the Province of Alberta, both provincial and municipal organization has made substantial progress. The Provincial Government has a branch especially in charge of this work under the Provincial Engineer of Highways. Municipal expenditure in 1913 was $681,000; in 1914, $865,190; and in 1915 about $900,000. Provincial expenditure in 1915, principally on trunk roads, those paralleling the railway lines or leading out from shipping and business centres at right angles to the railway lines, amounted to $1,000,000, local organizations using their funds chiefly on roads branching out from the Provincial trunk road systems.

### Saskatchewan.

The Province of Saskatchewan has created a Provincial Board of Highway Commissioners, the duties of which are as follows:

(1) To lay out, plan and determine upon a system of public highways for the Province which may from time to time be altered or modified as the Board may determine.

(2) To determine upon the most feasible and economical methods for constructing, improving and maintaining public highways.

(3) To furnish the officers of the municipalities with information respecting the construction, improvement and maintenance of public highways.

(4) To appoint such engineers, inspectors and officers as are necessary for the proper carrying out of the duties of the Board and the provisions of this Act.

The Provincial appropriations of Saskatchewan for 1915 amounted to $2,000,000 but, owing to conditions created by the war, this was reduced to $661,000. As with the Province of Alberta, provincial expenditure is devoted as largely as possible to trunk roads while the local municipalities improve the branch lines; but receive 50 per cent of the cost of their improvement as aid from the Province, when these improvements have been carried out in accordance with the regulations of the Board.

### Manitoba.

The Province of Manitoba has been active in road construction, both through the Provincial Government and the local municipalities. In 1915 the municipal expenditure alone amounted to about $700,000; while under the Good Roads Act of the Province, the sum of $374,790 was spent, of which the Province contributed $141,700.

### Ontario.

The Province of Manitoba has created the office of Provincial Highway Commissioner and has adopted a Good Roads Act, whereby a Provincial subsidy is granted to municipalities to the extent of one-third for good earth roads and one-half the cost for gravel or more permanent roads.

The Province of Ontario has recently entered upon a programme of advanced road construction. A Department of Public Highways has been created. It has been announced that the collection of motor vehicle license fees will be made a Branch of the Highways Department and a revenue of $500,000 is anticipated for 1916. It is the policy of the Province to subsidize the construction of main and market roads to the extent of 40 per cent. Under this policy, an expenditure of nearly $7,000,000 has been created. The building of model and experimental roads, the organization of township administration, the construction of colonization roads have also been features of Provincial activity in which much progress has been made.

### Quebec.

Under recent legislation the Province of Quebec is seeking to improve the roads under three well-defined plans.

First, an Act, consolidated in 1911, which has as a chief object, the abolishing of the share system and statute labor (la corvee). To this end a small annual grant is given to townships, from $200 to $400, on condition that they comply with certain conditions. About 400 municipalities, out of 1,130 have become entitled to this grant.

Second, Provincial grants are made to townships as aid in gravelling or macadamizing roads; not to exceed $1,000 a year for macadam, nor $500 for gravel, and based on 50 per cent of the expenditure.

Third, under an Act of 1912, the Province of Quebec appropriated $10,000,000 (supplemented in 1915 by an additional $5,000,000) for more substantial construction under two methods:

(1) Main roads built by the Province.

(2) Roads built by the municipality.

On a system of trunk roads nearly $4,000,000 has been spent by the Province. In the case of roads built by the municipality a feature of the Quebec aid to municipal construction is that, for substantial improvement the Government will provide the necessary capital, charging the municipality 2 per cent for a term of 41 years, the Government meeting the balance of interest and sinking fund. About $8,000,000 has been thus appropriated to the present time.

(Continued on Page 93.)

# SOME BIG MUNICIPAL MEN

(By AJAX.)

## W. A. McLEAN, C.E.

Since roads and their building have become to be so much a part of Canada's economic system (one of the essentials of our well being) our minds, at times go out to the builders and it would be hard to find one who has done so much in not only the building of roads, but in creating that public spirit necessary for their being, than W. A. McLean of Toronto. The little man with the big brain, who at the present moment is deputy head of the new Ontario Department of Highways with the title of deputy minister.

Mr. W. A. McLean, since he became the chief engineer of Ontario's highways, and had an opportunity to put into practice his great gospel of good roads, has worked day and night enthusing his engineering staff, and the rural municipalities to the fuller meaning of making the highways the best in the country. And he has succeeded even better than he planned. His ability became recognized beyond the bounderies of the province. The road builders of the United States realized that in W. A. McLean a leader had risen among them and they elected him the President of the American Good Roads Association. He became the first President of the Canadian and International Good Roads Congress. In fact, one might term McLean as the embodiment of the great movement that has spread in every part of this continent for the better building of roads.

It would seem that McLean's strength lies in the simplicity of everything he has to say on the subject of road transportation, and the enormous amount of common sense he manages to cram into every one of his arguments for his good roads gospel. But behind it all one realizes his tremendous breadth of vision. He sees a new Canada arising from the ashes of the present urban congestion. A rural Canada with a new social life begotten of better conditions for travelling. It is surely something worth fighting for.

## HIGHWAY DEVELOPMENT IN CANADA

(Continued from page 92.)

### Maritime Provinces.

The Province of New Brunswick under an Act of 1906 has brought in revised legislation respecting the performance of statute labor. Provincial Government expenditure under the Minister of Public Works in 1915 amounted to approximately $180,000.

The Province of Nova Scotia has made steady progress in road legislation and expenditure. In 1908 a Provincial Commissioner of Highways was appointed, an officer under the Commission of Public Works. Control of highway expenditure was shown a tendency to centralization under the Provincial authorities with more satisfactory results.

The Province of Prince Edward Island is not divided into municipalities and all roads are maintained directly by the Provincial Department of Public Works.

From the foregoing it will be seen that legislation respecting highways has made very marked progress during the past decade. All Provinces of Canada have now Provincial highway organization which is a step of a most progressive kind. Expenditures have shown very marked increase, notably in British Columbia, Ontario and Quebec. The growth of public interest in the highway problem is very marked and a clearer understanding is being reached as to the needs of highway construction generally.

While much has been done, much more remains to be accomplished and the field is a very broad one.

In the Dominion of Canada there are about 250,000 miles of graded roads. Road-building is a slow process, and in most countries it has taken half a century at least to provide adequate surface construction. The immediate objective in Canada should be to substantially improve about 16 per cent of the total, or 40,000 miles, which would carry the more concentrated market or farm traffic; while about 2 per cent additional, or 5,000 miles should be treated on a trunk road basis. The total cost might be approximately estimated at $250,000,000, of which about 50,000,000 has been spent.

## SOCIAL CONDITIONS IN THE RURAL MUNICIPALITIES.

During the year 1915, the Commission of Conservation conducted an agricultural survey on 400 farms in Ontario. The survey included 100 farms in each of the Counties of Dundas, Waterloo, Northumberland and Carleton. Various phases of farm life were investigated, and some interesting conditions presented.

Social conditions, and other incentives to keep the young people on the farms are to a great extent neglected, as many be seen from the following report of the survey.

Ten per cent of the farmers visited have had boys leave and go to the city. Seven per cent have sons married who are farming. Nineteen per cent stated that they were following some form of book-keeping, but only one man was following a complete method. Sixty-seven per cent take agricultural papers, seventeen per cent take story magazines, and seventy-five per cent take a daily paper.

In 53 per cent of the families visited there were young people over 14 years of ago while 31 per cent had a horse and buggy or an automobile for the young people. Sixty-one per cent of the farmers attended some kind of community event or events during the past year, chiefly church socials and picnics.

Here it may be stated that the rural churches have a great opportunity to develop the social side of their activities, to reach more of the young people in the country and interest them in clean amusements, sports and recreations. The local fairs also are prominent among the community events attended by the farmer. In Dundas and Carleton counties no organized clubs for games were met with, while in Waterloo, 13 reported a football club, and in Northumberland, six reported baseball clubs. Only one of the 400 farmers visited mentioned attending a literary society. Twenty-five per cent of the homes had no musical instrument of any kind; 39 per cent had pianos.—F.C.N.

## GET ON THE RIGHT ROAD.

Hard roads are cheaper than horse-flesh.

Drag the roads, not your loads.

Good roads are impossible only to the man who thinks so.

If the roads are to be improved, somebody must give service that can't be paid for in money.

Use system, make your tax dollar look two when put on the road, instead of like thirty cents.

We have to live with dirt roads; make them as good as possible.

There would be no unemployed problem to solve if the road problem was solved.

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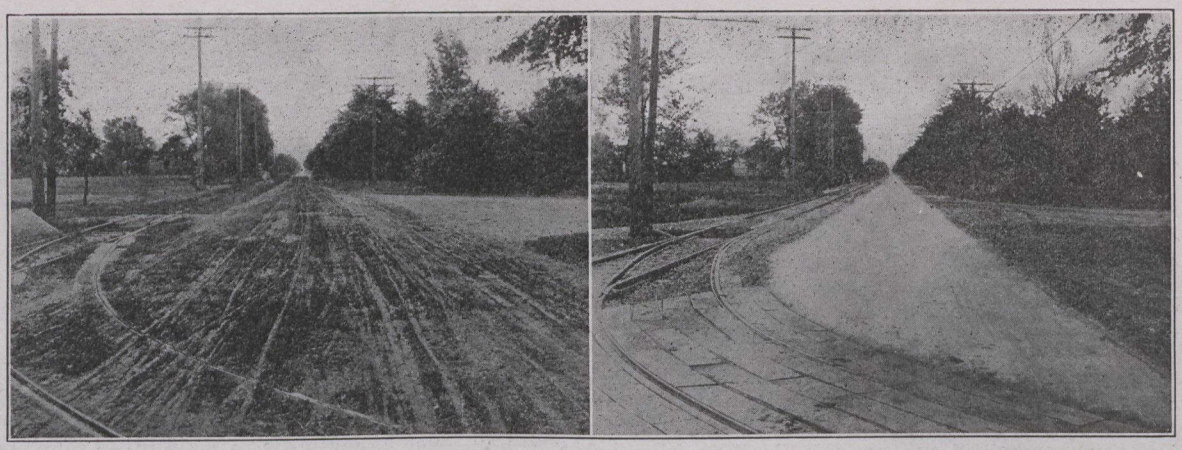
The "Scotsman" tells the story that there is not to be seen in the hamlets, villages, and towns or Scotland a young man of warlike age.



VAN DYKE ROAD, WAYNE COUNTY, MICH.

Before Improving. After Improving with 16-Foot Concrete Surface.

# A Satisfactory Paving Material

The time has arrived when good roads must be built. The people are now educated in regard to road value from the standpoint of financial gain and the social advantages to people living in the rural districts. The graded earth and gravel road no longer fulfills the demands of traffic. These types provide roads that can be used advantageously only during parts of the year. This condition makes it necessary to adopt durable roads of the hard surface type.

Formerly, farmers objected to hard surface roads claiming they were too hard on horses feet, but they now realize that a good hard surface road, which can be used every day in the year is such a great advantage that this objection is negligible.

In adopting the hard surface road (that composed of stones) the road builders' problem is to select a binder that will keep the stones in place. The automobile, being driven by the rear wheels, soon loosens the stones in a loosely bound road causing the road to ravel and rut. To overcome this trouble the binder used must be rigid and permanent. Portland cement is the only binder that meets these requirements.

### Quality.

Portland Cement Concrete makes a road of the highest quality. It fulfills all the necessary requirements of a good road. By having a low crown and being smooth and non-slippery, it forms a road surface which is very favorable for easy and fast travel. As a concrete wears very slowly by abrasion, a concrete road does not form dust or mud. The only dirt ever noticeable is that carried to it from adjoining earth roads, which is readily removed by wind and rain. Another valuable quality of a concrete road is its ease of maintenance. The contraction joints and any defects, which may develop from poor construction, are repaired with bitumen and sand or stone, and is a very simple operation. Necessary repairs are very slight, seldom costing over $25.00 per mile per year, and can be done without closing the roads to traffic.

### Economy.

Present conditions demand economy, not retrenchment, in expenditures. Money should be invested, not spent. Roads should be constructed which are economical when considered as investments. Investigation will show that the high initial cost, cheaply maintained road is an economical investment and that the low initial cost, expensively maintained road is a costly expenditure. Concrete roads can easily be maintained for the life of at least 20 year debentures for $50.00 per mile, per year. Wayne Co., Mich., maintains its concrete roads for $25.50 per mile per year. The average yearly cost for maintaining the macadam types used in New York and Massachusetts is over $600.00 per mile and these roads require rebuilding every ten years. Assume for example; a concrete road surface can be constructed for $14,000 a mile and can be maintained for 20 years at a yearly cost of $50.00 per mile. The money to build the road obtained by issuing 20 year debentures. It is essential that the road be maintained every year, that the interest (assume 5 per cent) on the debentures be paid yearly and enough money procured by yearly payments to rebuild the road in 20 years. The total yearly cost for this perpetual improvement is $1,173.40. A road of the macadam type can be constructed for $8,000 per mile, and can be maintained for ten years at a yearly cost of $500 per mile. Ten year debentures are issued to build this road. The total yearly cost for this perpetual improvement, including maintenance, interest and sinking fund, is $1,536.04 per year. The community by building concrete saves annually $362.64 per mile. Choosing the concrete road would certainly be economy.

### Permanence.

The permanency of concrete roads is unquestioned. Concrete paving which has been in use many years shows practically no signs of wear as is instanced in Bellefontaine, Ohio, where it was introduced in 1893, and Wayne County, Mich. Wayne County built 2½ miles on Woodward avenue in 1909. This road has had very heavy mixed traffic. A census taken in 1913 showed a daily average of 320 horse-drawn vehicles and 2,290 automobiles. This road proves the durability and permanence of concrete for all classes of traffic. The following paragraph is taken from the Ninth Annual Report of the Board of County Road Commissioners, dated Detroit, Mich., December 20th, 1915:

"With the exception of the finishing up of the small stretch of brick roadway on Gratiot Road (let by contract) and 643 feet of gravel construction on the Ford Republic Road, all of our work is of our standard concrete construction and has been done under our own supervision and jurisdiction by our own forces. We have made no changes in our concrete specifications as we feel that the manner in which our concrete roads have stood the test of time and use during the past seven years and the small amount spent annually on their upkeep is ample justification for our adherence to the specifications we have evolved and the methods we have followed in their building. We have never taken up and replaced a twenty-five foot section since we have been building and developing this type of road, and its freedom from ruts and holes has permitted us to devote our energies and moneys to new work instead of resurfacing and repair work, which forms so large a part of the activities of other communities where a less durable type of road has been built at the outset."

### Satisfaction.

Concrete roads embody in their highest degree of development the three great factors essential to a satisfactory modern highway,—Quality, Economy and Permanence. Permanent roads make the country property more valuable. Economical improvements make the people wealthier and these adavntages combined with the high quality of concrete roads completely satisfy the people. When people are satisfied with an article they purchase it again. When the road builders give the people roads which are satisfactory the whole country will be lifted out of the mud in record time.

# Dust Prevention

By MAJOR W. W. CROSBY.

Up to ten years ago the subject of Dust Prevention on roads had received comparatively little attention except in a few specific instances and in connection with city street maintenance. A few fruit growers had complained—especially where located along stretches of shell or soft limestone roadways—of the damage done by clouds of dust spread from the roads in dry weather spells by strong winds over their growing trees and vines, but in the main, a considerable amount of dust from even improved roads seemed to be regarded as an inevitable accompaniment of the serviceable roadway.

"Along came" not "Ruth," but the automobile. Immediately the dust question was vastly increased in importance and brought to general attention. The abutter began to receive the support and sympathy he deserved from the neighbors and from the visitors to the locality, from the travellers through it, and even from the automobilists themselves, whose driving of their cars was interfered with by the clouds of dust raised over the roadway.

In fact the wide penetration or distribution of the defects of the increased dustiness reminds one of the story of the colored men's discussion on the artillery now in use abroad. Strickland Gillilan tells it thus:

Three colored men stood on a Baltimore Street corner.
"Them French cannons kin hit yo' fi' mile off!" said George.

"That ain't nuffin'" scorned Joe. "Them thah German guns can pick a man outer a tree, ten mil off!"

Jim's scorn made him almost speechless.

"You all ain't said nuffin' 'bout shootin'—huh up! You all ain't mentioned GUNS. W'y all dem British shootin' irons needs is to know yo' address!"

Even "the address" of the road authorities seems to have been given the dust, for they were forced to consider seriously the question first of dust suppression. Naturally the underlying question of "Dust Prevention" followed.

There were doubtless other factors aiding in bringing about the consideration, such for instance as greater public interest in and demand for better hygienic conditions on the roads as well as elsewhere, and the important matter of protecting the roadways themselves from the removal from their surfaces of fine material valuable for protecting in many cases the road-crust itself from deterioration.

It had never been suggested apparently that the remedy for the unhealthy and unsatisfactory dustiness of the highways was the abolition of the motor vehicle. On the contrary their increase in numbers and their development for all sorts of purposes seems to be inevitable and probably fortunate. Therefore the antidote seems to be the curing of the defects of the roadway.

There can be no one best material nor one best method as conditions are "never—well, hardly ever" twice alike. Some discussion here of the various conditions, materials and methods of use may therefore be pertinent.

General agreement among high way authorities has developed the fact that dust proceeds not only from attrition of the roadway surface by hard tyres and the feet of animals, but also come from the grinding on each other of the pieces of aggregate or road-metal forming the pavement or crust. This internal wear of the surfacing is much greater than was formerly suspected, and it largely accounts in many cases, for the layer of mud and dust to be found on macadam for instance, even when freely removed from the surface at frequent intervals by scraping or sweeping.

The amount of the internally produced mud seems to bear a relation to the weight of the traffic, and to the moisture present—such as results from sprinkling with water—as well as to the friability of the stone used and to the methods of construction.

Real Dust Prevention it will be seen begins therefore with the construction of the road crust. In this work it will be necessary, in order to avoid as far as practicable the subsequent production of both superficial and internal dust—which latter rises eventually to the surface and becomes appreciable externally—by selecting road metal of the most appropriate hardness considering the traffic, by providing through proper drainage against the continued presence of an excess of water in the road-crust and by securing the firmest angular bond that the metal is capable of in the macadam.

No matter how built, a roadway, even in city streets, may become superficially dusty and the "suppression" of this dust from becoming objectionable may be desirable. Frequent cleaning or removal of the dust with the dirt may solve the problem, or it may be impracticable to that extent and other means of relief may be necessary.

The simplest of these is sprinkling with water to "lay the dust." The objections to this are: That it is seldom done efficiently because it has to be done periodically, and between the times of sprinkling when a temporary excess of water is applied the surface condition varies from muddy to dusty again. Further, the cost of sprinkling water may not be economical if that is the sole reliance for the suppression of the dust. Proper cleaning with sprinkling or washing of the street surface may under some city conditions be satisfactory.

Efforts have been made to increase the effectiveness of water sprinkling by the use of sea water, which contains hygroscopic salts, or by the addition of such salts as calcium chloride, to the water. Under some conditions the results have seemed to be successful to a certain extent. These salts absorb moisture from the air and tend to keep the roadway surface moist enough to hold down the dust even after the water originally applied with them would otherwise have disappeared and failed to do this. Their effect, however, is not permanent nor is it powerful enough to meet severe conditions of traffic tending to produce or raise dust. Further these salts are soluble and are washed away to the gutters and water courses by rain. Their re-application becomes necessary at intervals more or less frequent, according to local conditions.

Another what might be called "chemical" process consists of the use of concentrated sulphite liquor usually produced as a waste or by-product at wood pulp mills and commercially known as "Glutrin." The "Glutrin" is used either with or without the addition of water. The effects of the "Glutrin' are composite. It has some cementing powers such as exists with sugar. It also, through its tannic acid content, has a chemical effect on some of the materials composing the road crust which tends perhaps to strengthen their normal binding power. For instance it may make a clay much more plastic and tenacious. Further road surfaces treated with "Glutrin" seem to "set up" harder and, to some extent, to resist abrasion better.

The "Glutrin" is, however' more or less soluble in water, and eventually will be washed out of the road crust, even if the impregnation is fairly deep, as subsequent wetting of the crust brings the "Glutrin" gradually to the surface. Under some conditions the use of "Glutrin" as a dust preventive has been fairly successful.

The most successful of the materials used for either the prevention or suppression of dust on roadways are the bituminous materials and they can generally be used for both purposes.

If the voids in the road metal are, for instance, filled with bituminous material, the internal production of dust is prevented. The external production of dust even may also be reduced because of the cushioning effect of the pitchy matrix and the greater resiliency thus given the piece of road-metal subjected to the shock or attrition of traffic. If the bituminous material is only applied to the surface of the road crust, it still reduces the dust nuisance by suppressing the raising of the dust underneath or mixed with it and in many cases by protecting the road metal from any superficial wear from traffic.

Further a proper bituminous material possesses to a large degree, and greater than in the cases of other materials, the ability to absorb a considerable amount of dust produced elsewhere and perhaps brought on to the roadway through various agencies. This is important from the economic point of view.

What is a "proper' bituminous material will depend so largely in any case upon the local conditions that no close definitions can be given in this paper. Perhaps it might be said that, generally speaking, the asphaltic oils are better for this work than the paraffin base oils; that a good bituminous dust layer will give benefits other than the mere reduction of dustiness on the roadway, such for instance the reduction of noisiness and an increase in sanitariness, and that usually its proper application will be in the interests of both economy and general satisfaction.

On the other hand, the improper use of an unsuitable bituminous material will produce results on the roadway second to none as far as nastiness and general dissatisfaction are concerned.

# "Finance" of Good Roads

(S. L. SQUIRE.)

The subject of Finance is perhaps the one of more basic importance than any other, in reference to "Good Roads," for while engineers may conceive and plan and labor be prepared to execute, unless the necessary money is provided, all else would be in vain.

It has been stated, and perhaps was truly said, that the need of better roads requires no further discussion; that all are agreed to their necessity. This may or may not be true, but if it is I wish to point out this fact as a parallel truth, that with the present knowledge possessed by most of the people in rural sections, they consider the roads they have preferable to improved roads promised, if the cost to the individual is very great.

I submit that while the rural resident of Canada possesses as great an ability to think, as does the resident of the larger centre, still information is more slowly deseminated and impressions are less deeply made in the Country than in the City.

My contention, then, is that the Country everywhere is ready for improved highways, providing there is no personal cost. Do you think it a Canadian characteristic to want "Something for Nothing?" Are we not willing to accept the things which we consider an advantage to us, at the hand of a Divine Providence, a generous government or a liberal friend, without so much as a "Thank You"; And do we not hesitate to entertain a proposition, if there is a cost to us attached? This is not peculiar to the rural resident, the man in the City wishes to take short cuts, with the desire to get rich quick that the man in the Country knows nothing about.

This is found in real estate, mining stock and margin market gambling and is fed by a desire to get "Something" for which we have not paid an "Equivalent," to get "Something for Nothing" and presents only in another form, the characteristic shown by the farmer, who is willing to accept the advantages of the improved highways, when the Government or someone else pays for it. If this is true, how can these impressions be overcome? The roads cannot be built without money, and a large amount of money.

First of all, can we afford it? I will deal with Ontario, believing that what is true in Ontario, is true to a greater or lesser extent of all the Provinces.

The Commission appointed by the Ontario Government in connection with "Road Improvement," in their report proposed the expenditure of $30,000,000, this amount to be used in 15 years and to be expended as the Organization and demand might warrant reaching as a maxium, annual payment $2,500,000. This would mean an expenditure of $1.00 per capita, per anum, for the Province of Ontario or with approximately 15,000,000 acres of land in Ontario, under crop cultivation, would call for an expenditure of 16c per acre, providing that the entire expenditure, recommended by the Commission was to be levied upon the land. If we carry the cost question to a conclusion and follow the recommending of the Commission, apportioning the payments, as recommended by them, asking the Government to contribute 40 per cent, the City 20 per cent, and the Counties 40 per cent of such cost the assessment per acre of land, under crop cultivation, would be less than 5c per acre, or if the average 100 acre farm, throughout Ontario has 60 acres cleared and in shape for crop, the average levy would be about $3.00 per annum. Truly this is a stupendous amount, less than 1-10 of a mill on the capital invested in agriculture in Ontario. My purpose in dealing with this, in this manner, is to brush away, if possible, any illusions and make clear the proper cost of improved Highways, as such cost may affect the average farmer.

Now we know that the financial side of a question is effected by economic conditions. We are reminded by many that the war and its effects make the present a very inopportune time to consider extraordinary expenditure upon highways. The war, like the bad boy in the community, is blamed very often for that which it is not guilty.

We all regret this awful war, but is there a Canadian who, in his heart of hearts, has any doubt about its ultimate outcome. And even if its effects were of a disastrous financial nature, would it not be incumbent upon us at home to develope the heroic in us, as much as it is upon the poor fellow who is our "Substitute" in the battle front. But what is our true financial position in regard to the war? The war has created in Canada an industrial activity in many lines, that would have been impossible without it. It has caused a demand for agricultural products, which has made a **"Greater Production Campaign"** apparently necessary. In order that those upon the soil, might be encouraged to produce a greater acreage of food products, it has made a market for our horses, which promised to be a drug; it has given us prices for our food stuffs, which without the war, would have been impossible.

The increased prices on all lines, due to war, has created added wealth to the farmer of Ontario, in the past six months to more than pay his portion of the entire amount of his 15 year contribution, based on the estimate suggested by the Highway Commission, and I believe that if the farmer is properly interested you will find him a willing investor and ready to do his full share of the paying.

I do not intend to tell the Government, how they may raise their 40 per cent of this large amount. I believe, however, that in one item only, which has proven productive of a large amount for the first time, within the last ten years, that of the license of automobiles. If the Government would capitalize the monies obtained from this quarter alone, they would be able to provide their proportion of the cost, and create a sinking fund to discharge any bonds, made necessary when due, and if the monies obtained from the users of the motor were expended upon highways, the Government would find the owner of the auto, a willing contributor.

In connection with the country, I would not advocate any but short term bonds, say for a period of 15 years, this would do away with excessive interest charges. It would occur to me that if the average cost of the roads in rural sections were, $5,000 per mile, of which amount the county was expected to raise 40 per cent, or $2,000, it would be fair to ask the county to contribute 50 per cent of this amount, or $1,000. The statute labor of those whose farms faced the improved roads capitalized would provide 25 per cent, and assessing for benefit, those who derive as direct benefit, and whose property have an increased value, because of the advantages of such roads be 25 per cent that this would make a fair distribution of cost. To illustrate, in connection with the capitalizing of statute labor, the average assessment of the 100 acre farm, in a township in which I am very well acquainted, is $4,000 per 100 acres. This assessment is subject to seven days' road work, which can be commuted as fixed by By-Law of the Township at $1.50 per day. This would allow the raising of nearly $60.00 per mile per annum, which, if capitalized on 15 year bonds, bearing 5 per cent interest, would raise nearly $650.00 per mile, which might be used for permanent or improved roads. Thus the only controversal question would be the 25 per cent, which I have mentioned as being a fair amount to be levied against land as an assessment for benefit.

It appears to me that the present problem is rather in our being able to create a willingness to pay than in our ability to pay, and I believe that if the people of this country were satisfied, there would be a fair distribution of the cost, and that no man would be asked to pay for the benefit that another man would likely receive, we would be able to develop a spirit of co-operation, which would in itself, provide funds beyond the dream of the most ardent good roads advocate. If then we adopt the slogan courage, and evidence our faith in the Dominion and its resources, by taking a forward step in the construction of good roads, we would not only demonstrate to the world our belief in the future, but would thereby strengthen our own convictions.

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Australia has been able to do what she has because, as the corner-stone of her democratic edifice, she has a system of compulsory military training. A free nation can remain so only if its citizens help to keep it free. In a democracy every man must be educated in the primary duty of citizenship — ability to defend his country, his home and himself.—Premier Hughes.

# Municipal Finance

JAMES MURRAY,

## THE NEW TAXES.

"Every good citizen and reasonable man will loyally stand back of the Finance Minister in the adoption of the plan of taxation that finally may be considered best in the circumstances, but in return the people of the country will demand, probably more emphatically than ever before, that expenditures in connection with the war shall be without wastefulness or extravagance, and that the Finister of Finance, with his colleagues, shall see that the country's money is neither pilfered nor squandered."

Baron Shaughnessy in the above sentence has touched the key of the national feeling at this moment in Canada's' share in the great war. There is no doubt but that at the beginning many men made money at the expense of the state because of the lack of efficient checks. But the machinery is much better to-day and now that the strong limelight of public opinion is centered on public expenditures the chance of the grafter is getting less and less.

This curbing of public extravagance is being equally applied to civic expenditure and many a municipal balance will show financial cuts which would have been thought impossible two years ago. Many municipal offices have been depleted of half their staffs by enlistment, and though the vacancies have not all been filled up the work goes on just the same. A little more work for the officials left behind—no more. But think of the saving—and the new experience.

## BOND DEALERS' DELEGATION TO QUEBEC.

The Bond Dealers' delegation which waited upon the Premier of Quebec last month was significant in the facts, not only of the personnel (which was under the chairmanship of William Hanson, whose house is probably the oldest one in Canada), and which represented the principal municipal bond houses operating in the East, but because of the embodiment of a principle, which was being interfered with by certain irresponsible executives of three small municipalities. Practically the offence of these Councils was that they wanted power to borrow without having to provide a sinking fund or any other safeguard for the investor. As a matter of fact the bills were all refused.

What might be considered somewhat unusual as coming from the Province of Quebec was the confidence expressed by the delegates in the safeguards on civic loans provided in the Provincial laws. The borrowing clauses of the Cities' and Town's Act in particular are stringent enough to satisfy the most exacting investor, and as the weapon for carrying them out is largely in the hand of the investor himself, the municipalities have nothing to do but submit with grace, which most of them do, with the exception of such as those who were pulled up in time by the delegation's timely visit to Quebec.

## DEALING WITH SINKING FUND SURPLUS.

A municipal treasurer in writing to a contemporary takes up the question of how best to deal with a sinking fund surplus—when there is one.

"I have been trying for some time to find out," he says, "how the ratepayers of cities which invest their sinking fund cash in debentures earning more than the rate calculated in the sinking fund instalment get the benefit of the increased earning. I nave learned very little to satisfy me that the ratepayers get any benefit at all from the increased earning. One large city inform me that they use their surplus earnings to offset depreciation in their investments. This city is supposed to have its sinking funds invested in the most up-to-date way. Another city, which are believed to keep their accounts in the best manner possible, tell me that they hardly ever have a surplus, but if they do, it is used for buying new debentures for the same work.

"My opinion is that if the sinking fund is earning more than the rate calculated, there must be a surplus, and the sinking fund account should be arranged so that, when the present worth calculation is made from a certain date, the sinking fund should be reduced or the instalment stopped, so that with its earnings from that date on sufficient will be provided to meet the debenture at its maturity.

"This, in my opinion, gets rid of the surplus in the most convenient way; but I am told by some authorities that the municipal act does not cover such a point, and that one must go on collecting the annual instalment for the full term of the debenture. This, of course, heaps up a surplus if the fund is earning more than the annual instalment is calculated to earn.

"This sinking fund question is one that requires some method of adjustment, and it seems to me that we might learn something from the local authorities in England and the manner in which they handle their sinking funds to get rid of the surplus or provide for the deficiency. This problem should be taken up by the legislature and provision made for stopping payment when the fund has sufficient, or when there is sufficient in sight, guaranteed by first-class securities."

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## MUNICIPAL GOVERNMENT AND FINANCE.

(By THOMAS ADAMS.)

(Part of address delivered before Civic Improvement League, Ottawa.)

The greatest need in connection with these matters is that a department of Municipal Affairs or a Local Government Board should be created in each province That need arises from the fact that we require more uniformity in regard to measures which are necessary to secure (1) real and effective economies in the conduct of municipal business, (2) lower rates of interest on municipal borrowing, (3) greater efficiency in carrying out public undertakings, (4) proper auditing of municipal accounts, (5) prevention of fire and a consequent reduction in the cost of fire insurance, (6) proper control of labor difficulties during periods of slackness in employment with the least harmful results to the citizens affected during such periods, (7) enforcement of sanitary provisions, (8) avoidance of recurring mistakes in administration due to isolated local action, (9) reduction in cost of local improvement without lowering of standards of construction, (10) unifying the methods of valuing land for assessment, and other matters. We cannot overcome the defects of human nature in the personnel of councils, Commissions or other bodies by legislation, but we can reduce the opportunities for bad management by setting up the right kind of machinery. At present we have a system of municipal government which is inherently bad because it lacks uniformity on the one hand and elasticity on the other hand, and to go on tinkering with it is to waste time and effort. We need a constructive policy which has for its final aim, the substitution of a new system for that now in force. We need not begin by destruction of radical reform of our existing local government institutions, but we should aim at ultimately securing a final readjustment of our system so that it will attain even higher standards than those of the Mother Country, where democratic local government is comparatively successful. As a beginning, we should recognize the need for apportionment of responsibility between the province and the local government unit — be it a city, town or rural municipality — and make the first step in reform the setting up of a provincial department, with a Cabinet Minister at its head to give exclusive attention to affairs of local govern-

ment. There are the beginnings of such a department in Alberta and Saskatchewan, but even in these provinces the question of giving them enlarged powers and wider scope requires consideration.

One of the most serious causes of bad sanitation is the absence of effective control over new developments just outside the boundaries of cities, in rural municipalities, and until we have a uniform sanitary standard for all urban growth, whether within the city or just over its boundaries, we shall continue to have unhealthy conditions. With regard to the question of the fixing of values of land for purposes of assessment, we have a position at present in many cities which contains all the elements of ultimate financial disaster unless we make an early attempt to regulate it. Bondholders frequently apply to government departments for statistics to enable them to judge of the soundness of investment in city bonds and they show a nervousness and lack of confidence in making these investments which is caused by our careless methods and is not justified by any lack of real stability in our institutions. That there is need for some stock-taking and re-appraisement of values is indicated by the fact that in more than one province we have an average assessment value per capita of nearly $1,800 as against about $550 in other provinces. In the largest cities and towns of Scotland the capital value of the assessed valuation is only $520 per capita notwithstanding that vacant land is all assessed at agricultural rates, and every street along which buildings are erected has been constructed according to the best modern standards. An owner of land and improvements in a Scottish town can raise about four-fifths of this assessed valuation on mortgage, and I leave it to you to compare that with the proportion that could be raised of the assessed valuation of land in some of our great cities.

My second suggestion under the head of municipal government is that we should ask the Census Department of the Government to take up the question of municipal statistics. We have no satisfactory system of collecting statistics regarding municipal undertakings and finance. We collect many statistics without any apparent object in view, some of little real value because they are incomplete, and others useless because the reason for collecting them has ceased to exist. With our growing towns and steadily increasing municipal and vital statistics prepared with certain definite objects in view and we should draw the attention of the Dominion Government to this need and appoint a committee of expert municipal men to confer and make recommendations to the department concerned. Here the need for co-operation is between (1) the Federal Government, (2) the Province and (3) the city or town.

### CALGARY, ALTA.

A by-law has been passed by the city council, to borrow $1,000,000 from the Molsons Bank on tax security.

### LETHBRIDGE, ALTA.

To the Alberta School Supply Co., Edmonton, $70,000 6 p.c. treasury notes.

### PRINCE ALBERT, SASK.

Borrowing Authorized — The council has passed a by-law to borrow $150,000 from the Imperial Bank at 6½ per cent interest.

### MOOSE JAW, SASK.

Bank Loan Authorized — The council has passed a by-law to borrow $625,000 at 6½ per cent interest from the Canadian Bank of Commerce, the loan to be the first charge upon 1916 taxes.

### EDMONTON, ALTA.

Bank Loan Authorized — The council has passed a by-law to borrow $2,075,000 from the Imperial Bank on temporary loan bonds, maturing in 5 years, bearing 6 per cent interest.

### ALIEN CIVIC EMPLOYES DISMISSED.

At a recent meeting of the City Council of Calgary, all civic employes of alien nationality were ordered immediately dismissed and all foreigners born in enemy countries employed in the Street Railway Department were laid off by order of Commissioner Graves this morning.

A rider was added to the motion to the effect that returned soldiers be employed where possible in the places of the discharged men.

## MANITOBA GOVERNMENT PHONES.

A surplus of $22,540 of revenue over expenditure was shown by the Manitoba government phones, according to the report of the telephone departm nt of the Government of Manitoba. It shows that the tot l revenue in the year was $1,769,589. The expenses came to $1,328,545, leaving a balance of $441,043 in net earnings. Interest charges amounted to $418,502, and out of the $22,540 surplus, $19,646 was transferred to the replacement fund, leaving $2,894 on hand.

The statement of revenue and expenses is as follows: Exchange revenue, $1,394,560; toll revenue, $333,088; sundry net earnings, $41,959. Expenses total $1,328,545. Operating, $601,076; current maintenance, $320,839; plant replacement, $405,340; taxes, $1,289. The net earnings were $36,705 less than in 1914.

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## IMPORTANT CHANGE IN BOND CIRCLES.

One of the most important changes made recently in Canadian bond circles is indicated by the following announcement:—

"The business and interests of N. W. Harris and Co., Inc., being identical with those of Harris, Forbes and Co., New York, the name of the former has been changed to Harris, Forbes & Co., Inc. M.r Ralph A. Stephenson continues as Manager in Montreal."

The firms of N. W. Harris and Co., Inc., and Harris, Forbes and Co. have for many years past been looked upon as among the largest bond houses in the United States, and the attention which they have given to the Canadian field has been especially important from the standpoint of the Dominion, inasmuch as it resulted in a ready market being found for a number of the larger Canadian provincial, municipal and corporation issues in the United States. It has always been recognized in Canadian bond circles that the fact that a firm of the standing of N. W. Harris and Co. was considering Canadian issues had quick resulted in other large American houses giving attention to the opportunities offering in the Canadian territory, and more especially in the last few years has been the means of Canadian issues finding a very ready market in the New York field. On this account N. W. Harris and Co., Inc., and Harris, Forbes and Co. have always been looked upon as the pioneer American banking firms doing business in Canada. They have been in business for over forty years, and have made a specialty of being investment bankers, always buying outright any issue that they were handling and placing it direct with investors, having purchased and distributed many millions of dollars worth of bonds which have proved safe investments for its clients.

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## MUNICIPALITIES SHOULD PUBLISH BALANCE SHEETS.

The publication in a contemporary of the balance-sheet of the City of Ottawa gives rise to the reflection that valuable ends would be secured were this excellent method of exhibiting to the world a statement of their financial position more widely followed by other Canadian cities. In the past, when it was the fashion for Provinces and cities throughout Canada to appear with more or less regularity in the London market to negotiate a loan or arrange for a sale of bonds, much difficulty and delay was frequently experienced by the paucity of data available to the British investor. And to-day, though loans be no longer possible, the amount of English capital invested in Provincal and Municipal issues and securities is of a magnitude sufficient to justify the regular publication of financial statements, not only on grounds of public interest, but as a national matter, calculated to work powerfully for the credit and good standing of the Dominion as a whole. Particularly so would such statements be welcomed at the present time. The world-conflict has involved so many enterprises in ruin, and shaken confidence in so many branches of investment, that the testimony afforded by the publication of figures by Provincial Governments and municipal authorities as to the inherent soundness of their financial position would do more to sustain and deepen the confidence of British investors in the Dominion than perhaps anything else.—"Canada."

## THE BUREAU OF MUNICIPAL RESEARCH OF NEW YORK.

The Bureau of Municipal Research of New York City, the pioneer scientific body for the cure of government ills, recently celebrated the tenth anniversary of its establishment. It was organized in 1905 through the efforts of Mr. Robert Fulton Cutting as a "Bureau of City Betterment," to devise ways by which the administration of the affairs of new York City could be simplified and improved.

Former President Taft spoke at the dinner regarding the needs for economy and efficiency in the national administration, especially at the present time when the program of "preparedness" promises to require hundreds of millions for defensive construction. He said, in part:

"The great danger that I see ahead of popular government is bankruptcy, due, as Mr. Cutting has said, to lack of popular knowledge of what the conditions are with relation to the income and the outgo. I know the government of the United States to be a wilderness with very few paths in it. I believe that the history of the Bureau of Municipal Reseach and the work done here furnish a broad foundation on which we are bound to rear a structure of greater economy. That such work as this can be carried on year after year through the efforts of private citizens is evidence of the existence of that patriotism which does not need any advertising."

### Bureau Unique of Research Body.

Unlike the great foundations and universities, however, the Bureau has no perpetual endowment. It is supported practically from year to year, and, under such an arrangement, its work would have ended long ago unless it constantly produced effective results. The contributors number nearly six hundred individuals. They include some of the largest taxpayers in New York, who realize that they are protecting their own interests as well as the interests of the community by the effect of the Bureau's continued and consistent study and assistance in the conduct of the city's affairs. Among those who support the work are some of the leading bankers and financiers of New York. Herman A. Metz, who was Comptroller of New York, contributed $30,000 at the close of his term for the sole purpose of enabling the Bureau to assist other cities of the United States in handling their financial problems in the same manner in which New York had been assisted. In its ten years of work, the Bureau has received and expended nearly $1,000,000.

### Many Cities Have Employed the Bureau.

The Bureau has not confined its work to New York City. Many other communities have availed themselves of the services of the expect equipment of this organization, on payment of the cost of the work. Some of the cities that have engaged the Bureau to make "surveys" of their local governments include Philadelphia, Reading, Pittsburg, Los Angeles, Dayton, Atlanta, Charleston, New Orleans, Norfolk, Buffalo, Rochester, Milwaukee, St. Paul, Syracuse, Portland, Ore., St. Louis, Springfield, Mass., Bridgeport, Jersey City, Newark, and many smaller cities. In Canada, Toronto and Brandon have engaged the Bureau.

### Its Work for the Nation and State.

The principles enunciated by the Bureau have more than a municipal application. They hold true for government in any place. The recognition of this fact, which applies particularly to public accounts, appropriations and report systems, has led the Bureau into county, state and national work. The Bureau has done work for Congress and for states, particularly the State of New York. Part of its staff served with the Federal Commission on Economy and Efficiency under the Taft administration in the endeavor to frame a national budget, and Dr. Frederick A. Cleveland, director of the Bureau, was chairman of the Commission.

The Bureau is absolutely non-partisan, and has cooperated with every mayor of New York, regardless of party, since it was organized.

## MUNICIPAL BONDS AWARDED.

### BATHURST. N.B.

$60,000 at 90, to Eastern Securities Company, Halifax.

### BROCKVILLE, ONT.

$16,000, to Messrs. A. E. Ames and Company, Toronto.

### WALLACE R.M., MAN.

$40,000, to Messrs. A. E. Ames and Company, Toronto.

### MACDONALD, R.M., MAN.

$5,000, to Messrs. Wood, Gundy and Company, Toronto.

### MIDLAND, ONT.

$13,000 5½ per cent, 1916-46, to Messrs. Wood, Gundy and Company, Toronto.

### CARLETON PLACE, ONT.

$5,494 5½ per cent, 1937.44, to Messrs. Wood, Gundy and Company, Toronto.

### BRUCE COUNTY, ONT.

$57,000 5½ per cent, 1916-25, to Messrs. Wood, Gundy and Company, Toronto.

### HESPELER, ONT.

Bond Sale.—W. L. McKinnon and Co., of Toronto, were awarded $8,000 5½ per cent bonds.

### KELOWNA, B.C.

Brent, Noxon and Co. of Toronto, have been awarded $4,000 7-year and $6,309 20-year sidewalk bonds at 90 and int.

### LONDON, ONT.

Harris and Co., Montreal, have been awarded the new issue of the City of London. Eighteen bids were received. The new issue of the City of London amounts to $555,492.48, of 5 p.c. gold debentures of varying maturities. The successful bid was 98,6975.

### Coaldale Consolidated S.D. No. 9 Alta.

To H. O'Hara and Co., of Toronto, $4,000, 6 p.c., 15 equal consecutive annual instalments at 95.50 and interest.

### YELLOW GRASS, SASK.

To W. L. McKinnon and Co., Toronto, $3,500, 7 per cent, 20-year bonds.

### QUEBEC.

A. E. Ames and Co., Toronto, has purchased an issue of $300,000 5 per cent 5-year school bonds of the city of Quebec, guaranteed unconditionally as to principal and interest by the city.

### THE PAS, MAN.

To G. A. Stimson and Co., Toronto, $130,000 5 p.c. 20-year bonds at 91.21.

### SASKATCHEWAN.

The following is a list of bonds reported sold by the local government board: Pibrock Rural Telephone Company, $2,000; village of Allan, $600.

### WELLAND, ONT.

Last year $231,367.04 was expended by the county on the good roads system, upon which the government grant amounted to $77,222.35. About 83 miles have been completed out of a total of 133 miles, and the cost averages about $5,000 per mile.

### KINGSTON, ONT.

R. H. Fair, road superintendent, reported that during 1915 the sum of $21,416.25 had been expended upon the good roads system in the county.

### HAMILTON, ONT.

The question of a municipal gas plant came up at a recent meeting of the board of control, when a shortage of gas was under discussion.

The British Columbia Municipal Department has granted certificates of approval for the following by-laws: Kelowna, $10,309 6 p.c. 7 and 20-year sidewalks; Vernon, $15,000, 6 p.c. 20-year, sewers; Fernie, $4,634.39, 5½ p.c. 6-year, sidewalks.

### KENT COUNTY, N.B.

The council has passed a resolution to borrow $10,000 from the Royal Bank for current expenses.

Debentures reported sold by the Saskatchewan Local Government Board from January 3rd to 7th, totalled as follows: School Districts, $1,950; Rural Tel. Co.'s, $3,100 and Towns, $3,500.

### VICTORIA, B.C.

$1,000,000, 3-year, 5 per cent treasury certificates to city's fiscal agent, Dominion Securities Corporation, Toronto. These, with supplementary authorized issue of $271,000 in treasury bills, are secured by $1,400,000 formerly issued unsold bonds.

### BERLIN, ONT.

The city of Berlin will offer the following bonds during March: Roadways, 5½ per cent 10-years, $65,000; walks, 5½ per cent, 20-years, $11,000; and sewers, 5½ per cent 30-years, $9,000; total, $85,000. Mr. Edwin Huber is the city treasurer.

### WOOD, GUNDY AND CO.

Mr. W. E. Wilder, who has been sales representative of Messrs. Wood, Gundy and Company, Toronto, for the province of Quebec, has been appointed sales manager for Canada, and Mr. H. R. Swenerton has been appointed manager at Montreal for the same firm, with offices in the Dominion Express building.

W. H. LEACH,
Supt. of Exhibits, Good Roads Congress.

# Engineers—And what they are doing

### AMERICAN ROAD BUILDERS' ASSOCIATION.

Col. E. A. Stevens, State Commissioner of Public Roads of New Jersey, was elected President of the American Road Builders' Association at its annual meeting held at the Automobile Club of America, New York, N.Y., on Friday, February 4. Other officers were elected as follows: First Vice-President, Arthur W. Dean, Chief Engineer, Massachusetts Highway Commission; Second Vice-President, Austin B. Fletcher, State Highway Engineer of California; Third Vice-President, William H. Connell, Chief, Bureau of Highways and Street Cleaning, Philadelphia, Pa.; Secretary, E. L. Powers, Editor, "Good Roads"; Treasurer, W. W. Crosby, Consulting Engineer, Baltimore, Md., Directors for three years were elected as follows: William D. Uhler, Chief Engineer, Pennsylvania State Highway Department; R. A. Meeker, State Highway Engineer of New Jersey; Governor Charles W. Gates of Vermont; R. Keith Compton, Chairman and Consulting Engineer, Paving Commission, Baltimore, Md.; James H. MacDonald, former State Highway Commissioner of Connecticut; Frank M. Williams, State Engineer and Surveyor of New York.

### TO INVESTIGATE FIRE CAUSES.

Kenora, Ont., has taken a firm stand in the matter of investigating the causes of fires, and at a recent meeting of the town council the following resolution was adopted:

"Whereas several fires of unknown origin have recently occurred within the town of Kenora resulting in the destruction of considerable property; and whereas it appears to be in the interests of the citizens generally that such fires be investigated; therefore, be it resolved that this Council is of the opinion that fire inquests should be held with respect to all fires of unknown origin."

### NIAGARA FALLS, ONT.

The city of Niagara Falls, Ont., laid 12,900 lineal feet of concrete sidewalks, for the most part 5 feet in width, during 1915. A small quantity of brick pavement was laid, the base being concrete and with grout filler and sand cushion. A short length of 1-course concrete roadway was also put down.

As nearly all paving work is petitioned for by the citizens, and as these petitions are often not presented before spring, Mr. W. C. Jepson, the acting engineer in place of Engineer Anderson, now an officer in the Overseas forces, could not give an estimate of the probable amount of paving which the city will lay in 1916. Last year some 2,500 feet of 18-inch main sewer and 9,500 feet of 10-inch and 12-inch laterals were laid.

### THANKS CANADIAN EXPRESS COMPANY.

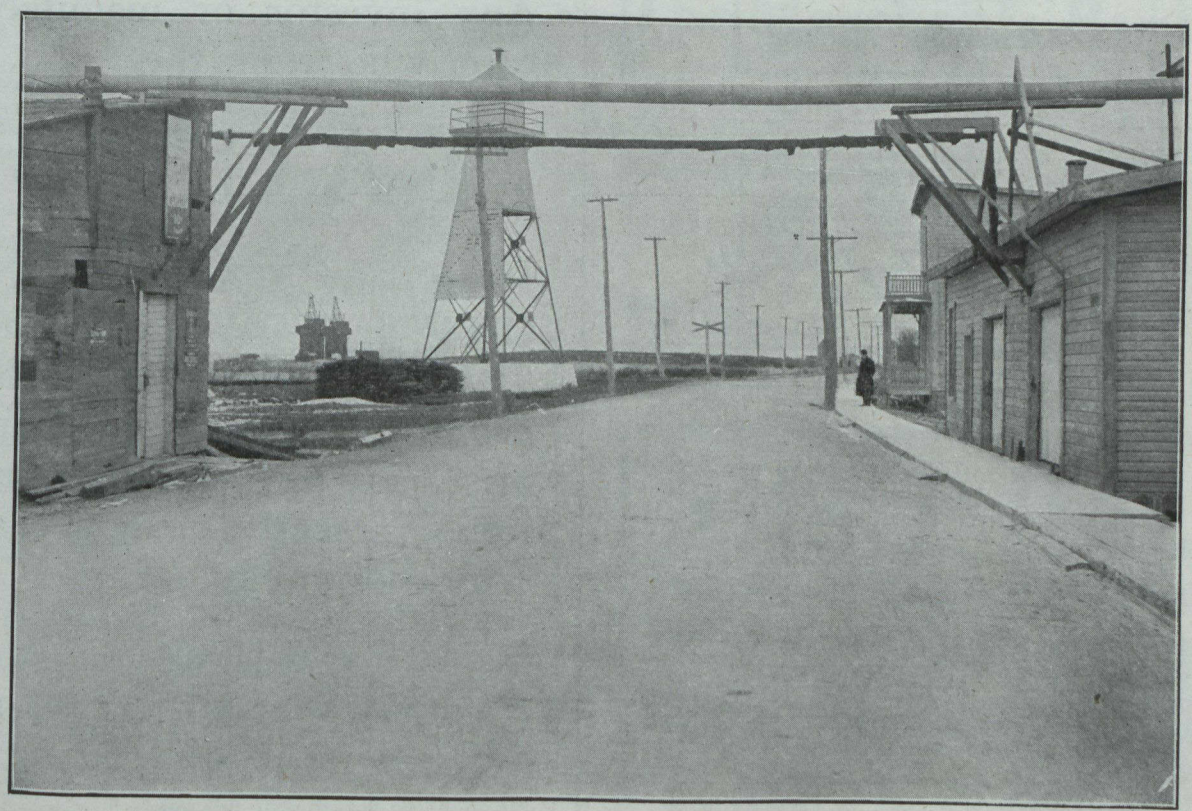
A letter has been received to-day at the headquarters of the Canadian Express Company through the European Traffic Department, London, England, from Lieut.-Col. D. W. B. Spry, A.A. and Q.M.G., Canadian Training Division, dated Shorncliffe, Jan. 9th, 1916, which reads as follows:

"I have pleasure in complimenting all concerned at the very satisfactory manner in which Canadian Express parcels for Canadian Troops at this station have been handled. It may be stated that at 10 a.m. on Christmas Day every parcel received up to that time had been delivered to the Unit to which addressee belonged. I take this opportunity of complimnting your representatives at Folkestone for the very courteous way in which they met the suggestions made by the Canadian Military authorities and for the splendid co-operation which they gave to our plans."

### CORRECTION.

In last month's issue we published a note on a ductility test of asphalt by T. Linsey Crossley, taken from the Journal of Industrial and Engineering Chemistry. By our bad writing the printer made the caption read as "Note on Duplicity Test of Asphalt." We regret any wrong impression that might arise from the mistake.

NOTRE DAME ST., THREE RIVERS



Part of the Montreal and Quebec highway showing the smooth surface given by **FLUXPHALTE.**

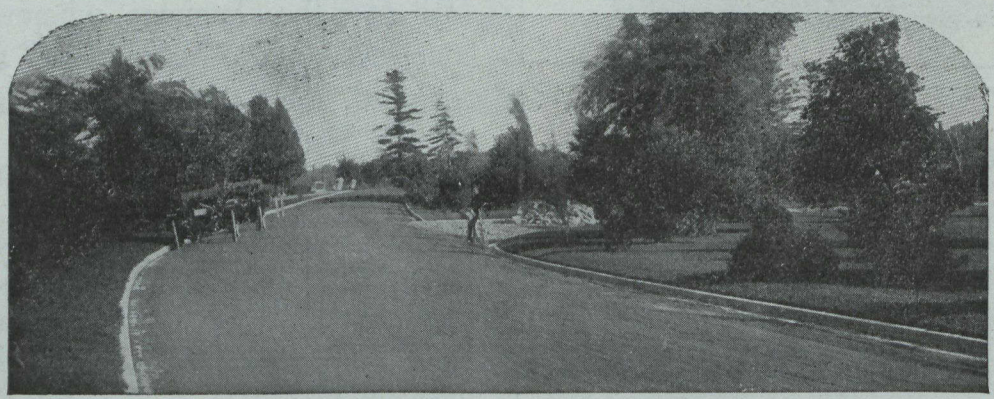
# Use of Refined Tars in Road Construction and Maintenance

(By J. RANDALL ROBERTS, B.Sc.)

It is a well recognized fact among highway engineers that one great cause of the distintegration of waterbound macadam and gravel macadam roads is "internal attrition."

When a heavy motor truct or automobile is travelling up a grade or even along the level, there is a strong strust developed under the driving wheels, which, while propelling the vehicle forward, tends to push the upper part of the road backward. The same is also true in the case of horse-drawn vehicles, only here the "thrust" is under the horses feet. This "thrust" causes a slight rubbing of one stone on another in the wearing course of plain macadam roads, which in a comparatively short time causes internal wear, and results in the formation of depressions and hollows, even though the foundation may be still firm and unyielding.

To overcome this difficulty, dense, heavy, refined tars have been used as a "binder" for many years in England and France, and for about twelve years on this continent. Abroad, the method followed has been to mix the crushed stone or slag with the heavy refined tar (at boiling temperature) and place the mixture on the prepared foundation, consolidating the whole with a suitable roller. This method has been followed on this continent to some extent, but the greater percentage of "tar macadam" is built by the penetration method. In this case, the layer of stone is placed upon the prepared foundation to the desired thickness, and then "grouted" with the heavy refined tar, at approximately boiling temperature. The road is then finished by covering this course with smaller stone, sealing same with additional refined tar, and then covering with sand or screenings and rolling. There are several refined tars on the market, one of the best known being tarvia. A tarvia "X" macadam road corresponds very closely to the standard English practice in new construction.



**GOVERNMENT PARKWAY, OTTAWA, ONT.**
**13 Miles, Maintained since 1910, with tarvia.**

Tar macadam is an especially suitable type of road for trunk line highways, where the traffic is fast and heavy, on account of its durability and low cost of maintenance. In villages and towns, and in the residential sections of the larger cities, tar macadam is also very satisfactory, on account of its dustlessness, as well as durability and low maintenance cost. Under ordinary conditions, this type of road costs between sixteen hundred and twenty-five hundred dollars per mile more than the corresponding plain macadam, depending on length of haul of material, width of roadway, etc. In considering the question of road cost on a five-year basis, or longer, which is really the proper method, it has been proven many times that this extra initial outlay is more than justified.

The consideration of road costs over an extended period brings up the question of maintenance, the importance of which is only just beginning to be recognized by the average municipal official. Tar macadam should be watched closely during the first year of its life, as this is the most critical period. Any weaknesses which develop, such as formation of depressions, or buckets, due to poor foundation, or lack of sufficient "binder," should be repaired at once, so that the whole road will wear uniformly. From time to time, say every two or three years, oftener under heavy traffic, the whole road should be "painted" over with a light refined tar, and "blotted" with sharp sand or clean screenings, at a cost of from three to six cents per square yard. In this way, the surface is renewed as often as it wears out, so that, if the workmanship and materials used in construction were of the first class, the road may be made to give the greatest satisfaction and service indefinitely and under economic conditions.

This method of maintenance by surface treatments of refined tar is equally applicable to plain or water-bound macadam and "gravel" macadam roads, as well as tar macadam, and is, in fact, one of the very few successful methods of maintaining these types of road. A great deal of car must be taken, in all cases, in cleaning the surface, so that the new coating of light refined tar will stick and not peel off. It is needless to state that the road should be thoroughly dry at the time of application.

In general, it may be said that, under a comparatively heavy mixed traffic, composed of both horse-drawn and motor driven vehicles, light annual applications of light refined tar (cold application) with sand covering, give the most economical maintenance. In parks, cemeteries, private drives, etc., where application but once in two or three years is contemplated, a denser refined tar, applied hot, covered with clean, half inch stone, seems to give greater satisfaction, as by this method the light "stone color" of the roadway is preserved, a condition generally sought after in said locations.

Another very important consideration, which goes hand in hand with maintenance, is dust prevention. The use of refined tar in both construction and maintenance prevents in great measure the formation of dust from the road itself, which helps the maintenance thereby, owing to the retention of the road material in place, eliminates the cost of water sprinkling where such would otherwise be necessary, and also prevents the formation of mud in wet weather.

It might be thought to be more economical to build a plain macadam road and maintain it by surface treatments of refined tar, than to build the road as a tar bound macadam in the first place. This might be true under very light traffic conditions, but it is generally conceded, where the choice lies between the two, that for practically all locations where these types of road are warranted, it is cheaper and more economical in the long run to build the tar bound macadam. However, both tar bound and tar surfaced macadams are far superior to a plain water bound macadam road, no matter how well built this may be, as the well-known defects of ravelling, results of frost action, and of internal wear, also excessive dust, which are common to a water bound, are practically eliminated in a tar bound, and overcome, to a great extent, in a tar surfaced macadam road.

## "CANADIAN MADE ASPHALT."

The refinery of The Imperial Oil Co., Limited, now being built in Montreal, will be, after its construction, the only Asphalt Refinery in the Dominion of Canada. In the past, practically all the asphalt was of foreign manufacture. The new refinery, which will be one of the most modern and best equipped ever constructed, is for the refining of crude asphaltic oils of the highest grade exclusively, producing thereby the best material possible for the making of asphaltic roads. The equipments of the plant consist of fourteen large crude oil stills, many special reductors, and pressure distillators and agitators, and a special factory for the manufacture of metal containers in which, with the aid of tank cars, the material will be shipped. The plant will have a capacity for crude and manufactured products of over 600,000 barrels.

The refinery is located at Montreal East, on a piece of ground containing more than 55 acres, fronting the St. Lawrence River. The property runs over one mile north, crossing Notre Dame Street to above the Canadian Northern Railway Co.'s tracks. The company has on the river front its own wharf; the depth of water being sufficient to permit ocean going tank vessels transporting crude oil, to dock at the wharf. The shipping facilities by waterway, either in bulk or in packages, are of a great advantage.

As to the shipping by rail, the Imperial Company has the Canadian Northern Railway and the Montreal Tramways Co. at its disposal, and later will have the Harbour Commissioners' Railway.

This modern installation represents an expense of more than $1,250,000, and when in f ll operation should employ at least 3,000 men.

# The Best Good Road—

Any road to be ***best*** must embody to the fullest extent the factors of quality, economy and permanence, which create satisfaction.

### Quality

The quality road must be—easy riding over the full width—easy to maintain—sanitary—suitable for both automobiles and horses, and present a pleasing appearance.

### Economy

The economical road must be constructed at a relatively low cost and be cheaply maintained. Funds should be devoted to building more good roads instead of resurfacing and repairing old roads.

### Permanence

The permanent road must be able to stand up under the most severe traffic strain and have long life. It must be built of a material that cannot be blown away by the wind, washed out by rain or ground out by wheels.

### Satisfaction

The satisfactory road must satisfy every one using it every day in the year. It brings markets nearer, increases property values and per capita wealth, it creates pride in the community and gives the greatest advantages.

All of these factors are summed up in their highest degree of development in the road that

# —is built of Concrete

Concrete approaches nearer to the ideal for road construction than does any other material.

**Concrete has a relatively low first cost, minimum of maintenance and long life under any kind of traffic. It permits of a low crown, has a smooth non-slippery surface, is clean and easy of traction. It increases property values, community pride and the satisfaction of every one using it.**

**If you are interested in good roads let us send you our new, free booklet "Concrete Roads"**

## Canada Cement Company Limited

**779 Herald Building, Montreal**

***Visit Our Exhibit at the Good Roads Congress, Sohmer Park, Montreal, March 6 to 10, Inclusive***