At the end of a winter, during heavy thaw I have seen the water rushing down between the road surface and snow and ice without the slightest injury to the former.

After the second season it is desirable that the Tar coat should be renewed with one coat and dressed. If this is followed it will prolong the life of the surface indefinitely and the cost should not exceed 8 cents per yard which could be set against sprinkling. If the road be kept clean, there will be very little dust and will prevent ravelling by automobile traffic.

The cut of a cross section shows the macadam road in combination with two kinds of gutters; the standard sidewalk and gutter for residential districts, and the rubble stone gutter. The combination sidewalk and gutter gives a great deal more satisfaction in the early spring when the snow is melting than Boulevarded walks, as there is a great difficulty in cleaning the Boulevarded sidewalk owing to the banking of snow between sidewalk and gutter. On the opposite side the combination with a rubble stone or boulder stone gutter is shown. This is a suggestion as a conductor of surface water from road surface, and retaining the natural strength of the earth to resist the pressure of spreading during the rolling in of the base; an important factor in the retaining of the camber of the road after construction.

Public Roads and Streets

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I gladly accept your invitation to write an article on the above subject, but must plead for some indulgence, because it is somewhat difficult to concentrate one's thoughts, when travelling from City to City, observing the marvellous developments which are taking place in Canada, and handicapped as a traveller must be when he is surrounded by others, who are vigourous in speech and action.

The importance of good roads and streets is now recognised by progressive municipal administrators throughout the world. Although the advent of railroads for a long period diverted the attention of the people from the commonplace subject of highways, this has been the experience of almost every country, but it has now come home to the people and administrators that there is an enormous amount of work to the done in this respect. It is now recognised by the leading municipal administrators that judicious expenditure of public money on streets and highways is a lucrative investment. Doubtless returns cannot be declared in the form of tangible dividends, yet the economy effected in the cost of transportation alone, will represent a valuable asset. Every economy effected in the cost of transportation has its influence on the cost of the specific material or goods and also on the cost of living.

The standard of efficiency of civic administration is reflected in the condition of the roads and streets, for these ares urface indications of good or indifferent government, and can be seen by all; whereas huge expenditure of money on sewers and water mains, which are equally necessary, are not so evident to the eye. Well-paved and clean streets are good indications as to how the departments of civic activity are maintained. Nothing induces civic pride as much as good streets, because they are seen by all and constitute a measure of successful administration, foresight and judicious expenditure of ratepayers' money. The converse to this is equally true, for unsightly, dirty streets are powerful factors in the demoralization of the people; dirts begets dirt, and a once tidy housewife will drift into slovenly habits if her suroundings are not good. No one can expect perfection immediately, for "Rome was not built in a day" still, true and wise economy consists in making progress at an early stage of the city's development. It has been a pleasure to observe what has been done in this respect in the larger Canadian cities, and to understand that money schemes are in hand or contemplated.

Canada is an enormous country, it is an empire or a continent of itself, and consequently the question of roads is involved in some difficulty, inasmuch as in the rural parts, the distances between centres of population are great, and the through road traffic is relatively small. But between villages and towns lying a few miles apart the same remarks do not apply.

In some quarters it is argued that the climatic conditions are so rigourous, that it is almost impossible to maintain a good road, that the cost of a good road would involve the authorities in an expenditure quite incommensurate with the benefits to be obtained.

If farmers can haul a heavy load to the nearest town or railroad with a pair of horses instead of with 4 or 6 horses, they derive a tangible benefit, but apart from this good roads induce traffic and business. What can be done by railroads to create a new commercial centre by providing improved facilities for transportation, will also take place if good roads are built. Indeed, even if excellent railroad facilities are afforded, bad roads will constitute an effective check on prosperity. The development of a new city is quickened by providing good roads, whilst the amenities and prosperity of a rural district are influenced in a marked degree by the presence or absence of such roads.

It therefore becomes a matter for consideration on the part of local administrators as to what can be done to give the public such facilities as they need. It cannot be stipulated as a universal rule that one type of construction is essential or desirable; each district must be separately considered, for the supply of material and labour is not equally available in all parts, and the traffic requirements differ in each locality.

There are, however, a few points which are applicable to all roads, namely location, width, curves, drainage, gradients, camber, etc.

When locating a new road it is desirable to bear in mind in what position it is most likely to serve the greatest number with the maximum of convenience to the users. Some roads have been so located that they are seldom used with advantage. It is essential, in hilly districts, that roads should be located where the excavations and filling are small, so that the cost of construction might be kept low, yet the gradients must be such as to enable reasonable loads being hauled up without causing undue stress on horses.

The width of rural roads should be sufficient for vehicles to pass each other in safety, a width of ten feet is ample for one wagon to travel on, but it is inadequate when provision must be made for others to pass, so the minimum width should be 15 ft. to 20 ft. There are of course thousands of miles of road only 12 feet wide, but in the light of future development the extra cost of the additional width is not excessive, whilst the advantages are great.

Curves on important roads should permit an automobilist seeing ahead a sufficient distance to enable him to pull up so as to avoid accidents; this means that the radius of road curves should not be less than about 300 feet. If curves of shorter radii are made then there should be no obstructions in the line of sight.