

## ENGINEERING DEPARTMENT.

A. W. CAMPBELL,  
O.L.S., C.E., M.C.S., C.E.

## Better Roads.

Every now and again occasion appears to arise for reiterating the object of the Good Roads Movement, as advocated by the promoters in Ontario. It is so much more convenient at times to jump at conclusions than to reach them by the slower and more laborious method of adhering strictly to the trodden path, that it is not to be wondered at if the Good Roads Movement is occasionally misrepresented. To-day the movement is so well understood that, to misstate its aims is but to reflect discredit upon the person thus offending.

The Good Roads Movement is not a huge scheme to construct an extensive system of macadam roads on the English or any other plan that will entail a heavy expenditure and burdensome debt. The aims are more nearly expressed by the "Better Roads Movement." Not English roads, nor French roads, but Canadian roads are the kind we desire to see built. There is much, it is true, that we can learn from English and French and German and all methods of road construction. Our information in this respect cannot be too complete. But it is not by seizing upon any one plan or scheme that good is to be effected in Canada. It is by learning, first, the underlying principles, and then adapting them to circumstances as we find them in Canada that the aims of the Better Roads agitation are to be achieved.

A study of road making, as it is developed by the older and more experienced countries, will lead to the conclusion that roads well suited to the present conditions in Ontario can be cheaply built and maintained. Traffic on our country roads is not heavy. The population is widely scattered. As efficient service can be had from a comparatively cheap road in Canada as can be had from a very expensive road in England.

At the same time Canadians can well afford, and are as willing to pay as much per head of population as are the English for good roads. There is no effort to change the plan of country roads as we find them in Ontario. There is an effort, and one that is bearing fruit, to apply the best scientific principles of road-making to this general plan, together with economical methods of paying for them.

When the "Better Roads Movement" has accomplished its ends, roads will be better drained where they are now being raised to a dangerous height; water will be taken from the road instead of the road being lifted above the water; better metal will be used and it will be properly placed on the road; roads will be crowned uniformly, instead of being either dangerously "barrelled," or left flat or even hollow; wide instead of narrow tires will be used on wagons; statute labor will be

replaced by a system that can be handled more justly and more economically; durability and permanency will be sought; roads will be repaired, not once a year, but when repair is needed. The primary object of the "Better Roads Movement" is to check the waste that is now going on through misdirected labor and the absence of efficient roads, and to accomplish the most with the expenditure now being made.

It does not require an expert to observe the faulty construction of the roads we are making. Unfortunately for ourselves we are practising the greatest deception in professing to know all about road construction, when at least twice a year we are told by their woful condition of the temporary and inefficient manner in which work on them is being done.

Millions of dollars of money and its equivalent in work is being spent each year in making roads. We can point to but very few miles in the whole province that have been properly constructed, and this is largely due to the system or want of system in the various municipalities. Is it that our ratepayers are determined to prevent the improvement of our roads, or the adoption of a system which will expend our road tax in such a manner as will create an improvement?

Ever since Mr. Andrew Pattullo, M.P.P., first attracted attention to the need of reform in this matter, the question has been agitated, public meetings held, plans discussed, favorable resolutions for reforms passed, much interest taken, and there has been a unanimous feeling in favor of reform. While many municipalities have taken hold of the question in earnest and have made an excellent start, and will in a short time have solved the problem, yet it is to be regretted that in too many sections action is slow.

Every municipality is building roads — dry weather roads. It requires little skill to build such roads, for even a trail through the field or forest is good in dry weather. What we require in this country is roads that will be good in the long, wet seasons of spring and autumn. What more striking example of our indifference in this respect can be afforded than on a journey at the present time over almost any of our roads? Some of our big cities are narrow enough to encourage the shiftless and unprogressive in their indifference, but surely we have enough big men in the community who are broad enough to take hold of this problem, the solution of which will admittedly add so much to our industrial, social and commercial welfare.

THE MUNICIPAL WORLD in its first number took up the discussion and in every issue since has donated space to the matter, and will continue to do so until every municipality will have laid down a system which will provide for the proper expenditure of the public road tax, and embody the true principles of road-making. In every department of municipal work this is our object, and the results will be our reward.

## Sewage Disposal in Toronto.

The sewage of Toronto, collected by a system which aggregates about 230 miles of sewers, the waste of 175,000 people, amounting, it is estimated, to 16,000,000 gallons daily, is at present discharged into Toronto Bay.

The bay is practically a stagnant, land-locked body of water. The water supply of the city, taken from Lake Ontario, off the south shore of Toronto Island, is forced across the island and thence to the city through mains which rest on the bed of the bay. There is strong reason to believe that these mains are not perfectly water-tight, and that the water which reaches the citizens is, in part, bay water.

The probability is that Lake Ontario will always be the source of Toronto's water supply. Mr. Manserge, the English expert employed a few years ago to report on the system of water supply recommends, in place of the present intake, a tunnel to the island through the bed rock underlying the bay, this tunnel to be lined with steel. This method which will doubtless be adopted as soon as the city can face the expense, would not be above suspicion so long as the sewage is emptied into the bay, for there would still be the possibility of the polluted water of the bay percolating through and mixing with the water in the tunnel.

In addition to the pollution of the water supply, the present method of sewage disposal is turning the bay into a cess-pool, if it has not already done so. This alone constitutes a grave menace to health and is an abundant reason for the early application of a suitable remedy. It is the great blot on one of the most delightful cities of the American continent.

Mr. C. H. Rust, the city engineer of Toronto, has recently reported to the council on a system of sewage disposal. The report details the information gathered by himself, Messrs Ald. Saunders and Ald. Crane, from a recent visit to several United States cities — Worcester, Mass.; Lawrence, Mass.; Brockton, Mass.; Providence, Mass. and Reading, Pa. The history of the question of Toronto's drainage, which dates back as far as 1857, is then briefly outlined, together with extracts from the report of Mr. Manserge, referred to above.

Mr. Rust then discusses the various systems of disposal which appear feasible; the Septic treatment now in the experimental stage; Land Treatment, of which there are the two systems; Broad Irrigation, Intermittant Filtration and Chemical Precipitation.

Broad Irrigation is defined as "sewage being utilized over a large surface of land for the production of vegetation, consistent with suitable purification of sewage."

Intermittant Filtration is described as "sewage applied intermittently in as great volume and at short intervals as can be properly absorbed, and purified by the land, and while not excluding vegetation,