

Drainage.

One of the most serious defects in the streets of most towns is the lack of drainage. Good pavements are largely a matter of good drainage. Not that the shape of the roadway, the material of which the surface is composed, or the way in which it is laid are unimportant but that these are very largely a part of a system of drainage. Underdrainage is one of the first points to consider. It is the native soil which must really support the weight of traffic, no matter what material is used to form the surface. Gravel, stone, brick or asphalt are not sufficiently strong to bridge over a wet and yielding sub-soil. If this natural soil is kept in a dry state it can support any weight, and to this end underdrainage is necessary. Underdrains may be made of common field tile, four inches in diameter, placed on each side of the carriage-way, underneath the gutters, at a depth of about three feet. This "lowers the waterline" and secures a good foundation.

There must be surface drainage, and for this the surface must be crowned, or rounded up, covered with a hard surface metal, and open gutters provided to carry away this surface water. The surface metal, (gravel or other material) resists wear so that the surface of the road remains smooth, permitting the water to flow readily to the side of the road. But a further object to be attained by the surface covering, is to have a coating that will not allow water to pass through to the natural sub-soil beneath. By crowning the surface, rolling it to make it compact and smooth, water is at once shed to the open gutters at the side of the roadway.

Streets are apt to be too flat to properly drain the road surface. Roads must be sufficiently crowned, must be given a sufficient camber, to shed the water from the centre to the sides, where it may be carried in the gutters to a proper outlet. Nor should depressions or ruts be allowed to exist in the road to interfere to any extent with this surface drainage. The real secret of good streets is good drainage, and good drainage is obtained by removing all surface and sub-soil water as quickly as possible, before it can soften either the surface or the foundation.

Good Roads Make Good Towns.

Our attention was recently called to the relative sizes of two county seat towns in one of our prosperous middle states. The towns are eleven miles apart, and both are surrounded by farming districts that could not easily be improved. One of these towns has a population of 4,000, and the other 2,500. Both are situated on trunk line railroads of nearly equal importance, while the same cross roads enter both towns, thus placing them on a par for railroad facilities. But we were told that fifteen years ago, the now smaller town

was the larger, and had every prospect of continuing to be the best town. Good roads were agitated. The people of one county fought down the sentiment and did not waken to find out their mistake for several years. In the meantime the citizens of the other county voted good roads, and began a systematic plan of graveling, and pushed the matter to a speedy completion, so that all the main roads leading out of the then smaller town were gravelled to the county line in rather a short space of time.

What was the result? A farmer who opposes a good road in his own county is not averse to driving a mile or two to get on a good road in a neighboring county that did not cost him anything. So many of them did this that trade, far beyond the limits of the half-way line, found its way to the town offering the inducements of good roads. After a while the short-sighted people of the adjoining county saw their mistake, but could not build good roads and regain their portion of trade until their more wide-awake neighbor had outstripped them by sixty per cent., which it still holds and doubtless always will, as both towns have apparently obtained their full growth. —*Roadmaker.*

Locating Roads.

One of the first essentials of a good road is a good location, and in this the roadmakers of Ontario are as great offenders as any in the world. Location makes little difference in a level country, where, in point of grade, there is not much to choose from. In a broken, hilly country, on the contrary, it makes all the difference in the world. Nature so frequently points out the proper location for a road, that even a cow or sheep will follow it. But in our road construction, we almost invariably cling to the farm line and ignore what nature has done for us.

In many parts of the country we find roads which are almost a constant succession of hills and hollows until river bottoms are reached. No man can tell the amount of money which has been expended on these roads since they were first laid out; and no one can tell what further amount must be spent if good roads are to be made of them. If those who drive over those roads will look around they will find, perhaps not a stone's throw away, the valley of a stream along which a parallel road could have been made, equally direct, and without a hill, except the long, regular slope to the river flat. The whole line of such a regular grade would not cost so much to construct and maintain as perhaps one hill on the existing route.

Most of the bad locations have been made to keep on the farm lines, on the theory that the road should be adjusted to the farm, instead of the farm to the road. It is a great mistake for people to go on paying taxes, digging down hills, filling up valleys, and travelling laboriously

up and down with half loads, merely that a few fields may be square.

Locate the roads properly, avoid swampy ground if possible, and choose the long, regular stretches, even if the corners of a few farms are not exact right angles. It frequently shortens the distance to go around a hill rather than over it; hills are expensive, and regular grades in every way to be desired.

Municipal Electric Lighting.

The cost of a municipal electric plant in Annprior, according to contracts recently closed, will be \$20,000. A by-law has just been passed, in Almonte, to establish a municipal electric plant, at a cost of \$30,000. The village of Blythe is now putting in a 1000 light plant, and Southampton a 2000-light plant. Perth has obtained a valuation of the arc lighting plant owned by the Perth Electric Light Co., with a view to its purchase and operation by the town.

The operation of waterworks by municipal corporations has passed the experimental stage, having met with undoubted success. The trend is now towards the municipalization of electric lighting plants, and in the majority of cases is undoubtedly a wise step. In many instances it will be necessary for towns to buy out existing companies. There is one principle which, in such cases, councillors should keep in view. It is that these companies are entitled to fair consideration from the people. While councils must guard the public purse from the extravagant demands of companies, yet there should be a willingness to pay a fair and honest price for all plants expropriated and purchased, so that the charge of "confiscation" frequently levelled at the municipality by companies interested, may in the future, as we believe, in the past, have no reasonable foundation.

In the building of a sewerage system, or electric lighting plant, comprehensive plans are prepared in advance, many sessions of committee and council are spent in discussing them, even to the minutest detail, and every means is adopted for doing this work perfectly and economically. Street making, unfortunately, is looked upon as being a very commonplace problem, it is considered that any work done must be an improvement, that little skill or study is required in connection with the work, that a certain amount of money is required every year for making repairs, that it is part of the municipal tax which the people must provide annually, and from which little can be expected. In nearly every municipality an examination of the expenditure reveals to the people that streets and sidewalks, at best, are expensive public works to maintain, and the expense is much increased when the work is improperly done.