and when these defects commence, they increase with great rapidity. Culverts are permitted to fall to pieces for want of repair at the proper time. Drains become obstructed, and the roadway is allowed to be flooded and saturated for want of a little timely attention.

Repairs are made once a year and that at a season when least required, having a tendency to destroy the usefulness of the road at the only time when our roads can be called serviceable. When the weather is dry for several months in summer the ordinary clay road baked by the sun, if kept in proper shape, is an excellent roadway; but our novel system—as if to checkmate Providence—provides otherwise. As soon as such roads dry up showing signs of being fairly serviceable, it is the duty of each pathmaster to turn out, say in the month of June, and to the extent of his ability, with the statute labor at his disposal, plow up the sides of the road in the most irregular manner possible and then with drag scrapers bring the earth towards the centre of the road and there dump it so that each scraper full will stand out separately and alone, making the road surface as rough and impassable as possible. Wherever such earth is brought from the side of the grade it appears to be unwritten law that it shall be done by gouging with the scraper so as to leave depressions and pockets which will hold water. Where a road has been gravelled, but in the spring becomes rutted, with an occasional depression, offering an excuse for repairs, it appears to be the policy of our roadmasters to fill up the ruts with the coarsest gravel obtainable. Wherever there is a slight depression they dump a load of gravel large enough to form a mound. Should these repairs force the traffic to the sides of the road, the work is considered complete, except that it may be thought a further necessity to lay rails, logs, stumps, etc., crosswise on the sides of the roadway, obliging the travel to follow the centre or take another road.

It is absolutely essential to the maintenance of a good and economical system of roads that provision be made by the township for their repair as soon as signs of wear appear. However extravagant it may appear at first sight, to recommend that a man be constantly employed to go over such a mileage of roads as he can attend to, devoting his whole time to the work, there can be no doubt that it would in the end be the most economical plan. It is the same system pursued by railways in the care of their roadbed, and railway corporations are noted for their economical methods.

A man constantly employed in this way could fill up ruts and wheel tracks as soon as they appear, before water has been permitted to stand in them to assist in deepening them. A decayed plank would be removed from the culvert or bridge before an accident was caused thereby; and before the weakening of the bridge at this point had caused other portions to be destroyed. An obstructed drain would be opened before injury resulted to the roadway. Loose stones would be removed from the road where they are rolling under the wheels and the feet of horses. Loose gravel and stone would be kept raked into place until it had become consolidated. By these and many other simple means the roads would be at all times kept in a more serviceable condition; and of greater importance, repairs would be made in time to save the road from injury which could not be remedied; and in time to save much labor and expense in making possible repairs.

Some municipalities have adopted the plan of employing a foreman and a couple of laborers to devote their whole time to the roads of a district or township, and in such cases, a grader and other road machinery is employed. Whatever the details of the system, the principle should be the same throughout, that wear must be repaired as soon as signs of it appear, if economy and good service is to be had.

ROAD GRADERS.

A road grader is one of the most necessary implements for a township to possess. To depend upon manual labor for the first grading of roads, and the repair of others that require reshaping is a useless waste of labor and money. Improved road machinery is as great a saving in roadmaking as is the self binder or the steam thresher in farming operations. To neglect to use a road grader is as unwise as it [illegible] to return to the old time [illegible] and flail. If every ratepayer [illegible] same personal interest in the [illegible] he does in his farm, no muni[illegible]s would be without modern ma[illegible] for road work. The grader in [illegible] of a skilful operator will [illegible] work of fifty to seventy-five [illegible] in grading and levelling the roadway.

[illegible] ROAD ROLLER.

[illegible] implement in road [illegible] road roller. On [illegible] ds [illegible] dispensable. To [illegible] the gravel or [illegible] layer, before [illegible] the sub-soil, [illegible] ng more dur[illegible] every way. A [illegible] is too expen[illegible] of rural muni[illegible] instances town[illegible] a town in the [illegible] A horse roll[illegible] is less expensive [illegible] ties may see fit [illegible] construction of [illegible] the loose stone con[illegible] ffic less readily than [illegible] without rolling re[illegible] time very loose and

[illegible]NE CRUSHER.

[illegible] od gravel cannot be had, [illegible] for crushing is obtainable, [illegible] usher is most useful. Stone [illegible] broken by this means at a price [illegible] the range of every well-populated township, although a very expensive work when performed by hand. A crusher can be operated by the steam engine used for a threshing machine which can generally be rented. A crusher will prepare from 10 to 15 [illegible] day.

A rotary screen attached to the crusher will separate the stone into grades according to size, ready to be placed on the road in layers, the coarsest in the bottom of the road.

[illegible] WAGON TIRES.

It would seem as though in everything the present methods in regard to roads in Canada are contrary to good judgment. Gravel or broken stone is dumped loosely without even spreading, on a badly graded, badly drained [illegible] the use of these roads the [illegible] recklessness is glaringly apparent. When wide tires have universally replaced the narrow tires which are now found on farm wagons, a great part of the road question will be solved. Narrow tires of two and one-half inches in width have only one half of the bearing on the road which would be provided by tires of proper width. By referring to the supporting power [illegible] discussed in the paragraph on [illegible]tions," the effect of this is [illegible]nt. By the use of a six [illegible] roadway will support, [illegible] ng, twice the load which [illegible] t with a three inch tire. [illegible] cannot be too strongly [illegible] y cut and grind the [illegible] upheave it. Wide [illegible] rary, are a benefit [illegible] iury to the road [illegible] as rollers to pre-serve a smooth hard surface. In some localities wide tires are objected to under the argument that they increase the draft required to move the load. This may occur under certain occasional conditions of very wet and soft roads. But when wide tires are universally used this objection will disappear, as the increased draft is due to the ruts and mud caused by narrow tires.

DIMENSIONS OF ROADS.

For the average country road, a graded roadway twenty-four feet in width between the inside edges of the open drains, will be ample to accommodate travel. For the average road, if the central eight feet is metalled with gravel or broken stone, it will be sufficient. The depth and width of the open drains will have to be governed by circumstances. Sufficient capacity must be provided to carry away all surface water. The depth must be dependent also on the fall obtainable. With tile underdrains, deep open ditches are not needed to drain the road foundation.

A GOOD ROAD COVERING.—Cross-section.

The largest stones in the bottom and the smallest at the surface, free from sand and clay; and thoroughly rolled.

The use of tile does away with the deep and dangerous open ditches which may otherwise be necessary. The crown of the road should be such as to give a fall of one inch to the foot from centre to the edge of the ditch.

HILLS.

Hills are among the difficult portions of the road to construct, and are a constant source of expense for repairs. The reason of this usually is, that the drainage is imperfect. Water is brought long distances in open drains by the roadside, and poured over the hills, frequently to flood over the whole surface. It is not uncommon to find the centre of the road over the hill lower than the open drains at its side—if there are drains at all. The natural result is that washouts are constantly occurring. For conditions of this kind the simple remedy is to dispose of the water before it reaches the hill, by conveying it through the adjoining fields if necessary. The probability is that the greater amount of water has been carried in deep ditches past watercourse after watercourse in order to dispose of it over the hill; thereby avoiding the necessity of constructing drains through farm land in the natural watercourses. The secret of successful drainage with respect to roads, is to dispose of water in small quantities before it can gain force and headway.

Another common occurrence is to find water oozing from the surface of the road on hills. This is especially noticeable after the frost leaves these spots. The surface is soft and spongy and is cut readily by wheels. Such hills should be drained by placing a line of tile down each side of the roadway between the gutter and the gravel carrying these underdrains to proper outlets. Cross drains should be laid in the wet spot leading to the side underdrains in a diagonal course. Well concaved gutters should be made on each side of the roadway and at regular intervals catch basins should be placed to arrest the flow of water in these gutters leading it into the tile underdrains.

The roadway on a hill should be well crowned. This will draw the water quickly to the drains at the side of the road, instead of permitting it to follow the wheel tracks, deepening them to ruts.

LOCATION OF ROADS.

There are very many instances where, by changing the course of a road slightly, municipalities would save a large sum in construction, and at the same time produce a better road. A slight deviation would frequently avoid swampy or wet ground, or would do away with the necessity of expensive cuts and fills. A hill can sometimes be avoided or the grade very much reduced by altering the location of the road. There is a prejudice against taking the roads from the lines laid down in the original survey, and property owners prefer to have their farms bounded by straight lines. At the same time the value of good roads to the farm should not be overlooked, and whenever a change in the road allowance means the change from a bad to a good road, or a change from a steep to a gentle grade, the slight inconvenience created by the alteration of boundry lines will be many times repaid.

CULVERTS.

In no branch of municipal work is so much money wasted as in the construction and maintenance of sluices and culverts. In most townships these are built of timber. Timber is perishable, culverts are subjected to repeated changes of wet and dry weather, the severest test to which timber could be subjected. Each year a large number of these culverts are renewed at a cost of from $5 to $50 each, in some townships aggregating from $500 to $1,500, and this is an anunal outlay. The life of these structures is so short that it is not more than five years before repairs are required and these repairs in a short time amount almost to renewal of the most expensive kind. A broken plank, or stringer, a rotten log or any timber replaced with new at different periods, makes the maintenance very costly, and this class of structure the most temporary and expensive. No sooner have they all been rebuilt than we must again commence the reconstruction of the first, in this way the expenditure becomes perpetual, and fixes a large percentage of our annual tax. If these culverts are in their proper locations, natural watercourses, and other fixed places, they will always be required and their construction in the most durable manner is the best and most economical plan.

For small culverts there is very little difference in the cost of timber and vitrified pipe. If properly laid the latter will withstand the frost and is durable. These pipes may be used up to 18 inches in diameter; and the capacity may be increased by laying two or more rows, but the pipes should have at least one foot of earth or other filling between them. Culverts of 5 or 10 feet span should be cement concrete arches, which is permanent if the concrete is properly made. The concrete should be composed of first class cement; clean, sharp, silicious sand, free from earthy particles and coarse enough to pass through a twenty mesh sieve; clean gravel screened through an inch and a half screen, the largest stones to be not more than two and one half inches in diameter; or in place of gravel broken stones that will pass through a two and one half inch ring. These materials should be mixed in the proportion of one cubic foot of cement, two cubic feet of sand and three cubic feet of gravel or broken stone, with just enough water to make the whole into a plastic mass. The sand and cement must first be mixed dry, then a sufficient quantity of water added to make it into a thick paste. It should then be thoroughly mixed again, spread out, the stone or gravel added, and the whole thoroughly mixed until every stone is coated with the mortar, then put it in place. The walls should extend well below the frost line and have a wing at the ends to protect the embankment from wash.

BRIDGES.

Wooden bridges, except where timber is very plentiful in the immediate locality, are not a good investment in view of the reduced cost of iron and steel, and the increasing cost of timber. Timber decays quickly, and while cheaper than steel in first cost, is more expensive after a term of years since the cost of repairs is very great.

Generally speaking the cost of an iron superstructure is more than that of wood. The substructure of stone or concrete is more expensive than pile or crib work, but as in other structures a firm foundation is most serviceable and economical. Wooden foundations from decay and other causes settle and the least settlement in the foundation twists the timber causing a disarrangement of the strains and frequently transferring the greatest load to the weakest point. Wherever timbers have a seat or bearing exposed, decay soon commences, and when least expected, collapses under a heavy load.

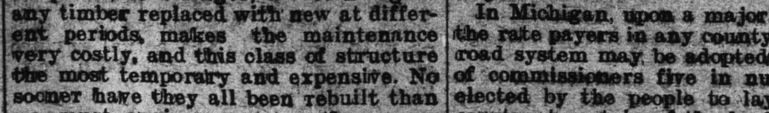
Wherever timber is used in bridges it should be used in members from four to six inches in thickness, the strength of the beam or chord being obtained by building several members together, properly breaking joints, and coating each bearing with lead. A further protection is to cover these built timbers with galvanized iron to protect the numerous joints and bearings from moisture. All caps, corbles, chords, braces and floor beams should be made in this way so that the thickness of no timber will be more than six inches. A wooden bridge should be painted one year after erection; iron bridge at time of erection, and care should be taken to see that they are kept painted and that all nuts are kept tightened so that each member may carry its fair share of the load.

The cost of renewing a wooden bridge in which a man has to be sent to put in a new timber from time to time, will amount to twice the initial cost of the bridge. In this way the ultimate cost of a timber structure becomes very great.

The course pursued by some, indeed most municipalities in erecting iron bridges is likely, however, to result disasterously, and throw iron and steel into disrepute. A council advertises for tenders. The companies responding supply their own plans and specifications. Thus far the procedure is entirely satisfactory. The difficulty arises when councils accept the lowest tender without obtaining the advice of an experienced builder of iron bridges as to the plans and specifications submitted. This is a matter in which few township engineers and surveyors are qualified to decide, and certainly the wisdom of councillors, entirely without professional training in such matters, is not to be trusted. Cases have occurred in which a difference of five dollars have influenced a council to accept a tender for a bridge which was manifestly, to a man of experience, worth less than the other by several hundred dollars; and which was indeed unsafe offering every likelihood of failure with attendant loss of life and great expense for reconstruction. It is difficult to understand the action of some councillors shrewd in other matters, in the construction of bridges and other public works proceeding with such apparent disregard for the true interests of those whom they represent. A small sum spent in securing reliable advice is as much a matter of economy in public as in private affairs.

RECENT ROAD LEGISLATION.

The State of Massachusetts is one of those which has taken advanced steps in road improvement. On petition of a county, the state road commission may, with the assent of the Legislature, adopt any road within the county as a state highway. Except that the grading and bridging is done by the county, the work thereafter, both construction and maintenance, is under the authority of the state commission. Also on petition of two or more cities or towns, a road between them may be made a state highway. The "state commission" is composed of three commissioners who compile statistics, make investigations, advise regarding road construction and maintenance, and hold public meetings for the discussion of road matters. One-fourth the cost of construction is paid by the county the remaining three-fourths being paid by the state. In 1894 the state spent $300,000, in this way; in 1895 $400,000; and in 1896 $600,000. It is intended that ultimately about one-tenth of the entire road mileage will be built as state highways.



READY TO RECEIVE THE GRAVEL.—Cross-section.

Showing earth shoulders as turned back by the grading machine.

In Michigan, upon a majority vote of the rate payers in any county, a county road system may be adopted. A board of commissioners five in number, are elected by the people to lay out, and construct certain of the leading roads, to be paid for and thereafter maintained by a county rate.

A bill has just passed the New York may be adopted as state roads. The petition of a county council, certain roads ma ybe adopted as state roads. The petition is first presented to the State Engineer. If he approves of the section of road thus sought to be improved, he prepares plans, sepcifications and estimates. These are presented to the legislature and, if approved by that body, 50 per cent. of the cost of construction is paid by the state.

The New Jersey Highway law provides that on the petition of the owners of two-thirds of the land bordering on a road, the state Commissioner of Public Roads will cause the road to be improved in accordance with plans and specifications prepared by him, subject to the approval of the Legislature. The owners of the land affected by the improvement pay one-tenth of the cost; the county pays six-tenths; and the state three-tenths.

Connecticut has introduced a plan of highway improvement providing for the appointment of three state commissioners. When a township votes in favor of constructing a road under the provisions of the State Highway Act, specifications are prepared and submitted to the state commissioners. If the commission approves, the township council lets contracts for the work, to be performed under the supervision of the state commissioners. One-third of the cost is paid by the state; one-third by the county; and one-third by the township. The expenditure by the state in this way is limited to $75,000 annually.

The State of Rhode Island has appointed a commissioner of highways. When a council represents to the commissioner the need for improving a certain road, an examination is made by him. If he considers the work necessary, he prepares plans, specifications and estimates; and reports to the municipalities affected, also to the state legislature as to the proportion in which the expense should be met by the state and the municipalities benefited. If the state legislature approves the work is performed by contract.

Vermont and California also contribute largely in the form of state aid, while Indianna, Kentucky and others contribute to a less degree. Only the bare outlines of the systems have been stated, with the object of showing the prominence the question of road improvement has attained of recent years. adopted within the past five years. In adopted within the past five years. In all these systems, safeguards are placed to prevent the expenditure exceeding, for any state or any locality, certain reasonable limits, according to requirements and ability to meet the payments. In most of these states the tax is so levied that the towns and cities pay the greater portion of the cost of state road construction; for example, in the State of New York it is estimated that the people outside of the towns and cities will pay only 10 per cent of the cost.

IN BRIEF.

Roads that "break up" are bad roads.

Make road improvements in such a way that they will be permanent.

Whether by statute labor or other means undertake roadwork systematically.

Appoint a supervisor who will have charge of all the roadwork.

Make road beats five miles in length, choose the best men as pathmasters, and keep them in office.

Classify the roads according to the nature and extent of traffic over them.

Specify the width of grade, amount of crown, plan of drainage, kind, width and depth of material to be used, and see that these specifications are carried out.

Purchase gravel by the pit not by the load.

Use clean road material.

Strip the clay and earth from over the gravel pit, before the time of performing statute labor.

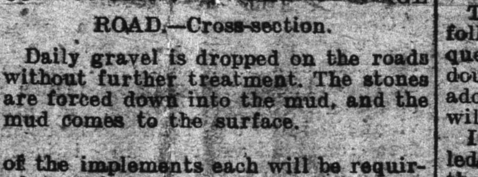
If screening or crushing is necessary, let this be done before the time of statute labor.

Do not scatter money in making trifling repairs on temporary structures.

Roads, culverts and bridges will always be required, and their construction in the most durable manner, suitable to requirements, is most economical.

If statute labor is to be made successful the work must be systematically planned and some definite end kept in view.

Have the work properly laid out before the day appointed to commence work. Only call out a sufficient number of men and teams to properly carry out the work in hand and notify them of the implements each will be required to bring.



COMPOSITION OF THE AVERAGE ROAD.—Cross-section.

Daily gravel is dropped on the roads without further treatment. The stones are forced down into the mud, and the mud comes to the surface.

Let no pathmaster return a rate-payers' statute labor as performed, unless it has been done to his satisfaction.

In justice to others make the statute labor returns clearly; show what work has not been done.

See that the council collects the amount from the delinquent parties and have it expended the next year.

The pathmaster should inspect the roads under his charge after every heavy rain-storm. A few minutes' work in freeing drains from obstructions, filling holes, diverting a current of water may save several days' work if neglected.

It is impossible to do satisfactory work on clay roads which are very wet or which have become baked and hardened by heat and drought. The operator of the grading machine should have instructions to commence work on clay roads as soon as the ground has become sufficiently settled in spring—and not to leave this work until the time of statute labor, usually in June, when the ground is hard and dry.

With the money which can be spent build permanent culverts, permanent bridges, buy machinery, buy gravel pits, prepare gravel for hauling, construct drains, operate the machinery.

Use the statute labor as far as possible in drawing gravel or broken stone.

Do not leave the gravel or broken stone just as it drops from the wagon. Spread the metal.

Crown the road with a rise of one inch to the foot from side to centre so as to shed water from the roadway to the drains.

Give the open drains a good fall to a free outlet. Lay tile underdrains where needed.

Drain thoroughly. Keep the road surface dry. Keep the earth underneath the surface dry.

Use road machinery.

Use graders, stone crushers and road rollers.

Improved machinery is as necessary for good and economical work as are self-binders and steam-threshers.

Employ one man to take charge of the machinery. He will become experienced and do better and cheaper work.

The same teams should be always employed to operate the graders. They become accustomed to the work and give better service.

Do not cover an old gravel road with sod and earth from the sides of the road. Turn this earth and sod outward and raise the centre with new gravel.

Adopt every means to secure a hard, smooth, waterproof surface.

Do not let stones roll loosely on the road.

Do not let ruts remain. They make travelling difficult, and spoil the road by holding water.

Make repairs as soon as the defect appears.

Use wide tires.

Improve the drainage of the hills. Make the crown of the roadway higher than on level ground.

Change the location of the road if a steep hill can be avoided.

Do not use wood for culverts. Use concrete, vitrified pipe or stone.

Do not build wooden bridges. Use iron, stone or concrete.

Build good roads.

THE GOOD ROADS MOVEMENT.

The demand for better roads is one which is far reaching and urgent. From Nova Scotia to British Columbia the question is being discussed and active measures are being taken to place road improvement on a more satisfactory basis. Throughout Canada statute labor still prevails but in all the provinces evidences are not lacking to show that a change in this regard will take place within a short term of years. It is not a matter in which any of the Legislatures are likely to interfere until the people themselves make such changes as the power with which they are now vested permits. The Legislature are, however, using educational means to influence the people to better their condition in this respect. Ontario and Quebec have appointed commissioners for this purpose. In New Brunswick and Quebec the provincial governments are granting aid to the Good Roads Associations and in the actual construction of roads chiefly, as yet for educational purposes. In Nova Scotia measures are being advanced leading to the expenditure of large Provincial grants, and to regulating the width of wagon tires. Manitoba has as yet taken no active steps, but in the North West Territories organization has been given to a statute labor law and in British Columbia the agitation is brisk.

The movement has grown out of actual conditions. The roads are bad. They are the result of a certain system. That system is therefore insufficient, and better methods are being sought. There is no desire on the part of any to increase taxation. The reverse is entirely the case. But where taxation may be increased to a slight extent, it is claimed, and fully substantiated, that the amount of taxation is many times made up by profit derived from the improved roads. The movement is on a firm basis, is one which is supported by the best economic principles borne out by the experience of other countries.

The possibilities of agriculture in Canada are unsurpassed by those of any country of the world. A comparatively small proportion of our land available for farming purposes, is under cultivation; and such lands as are under cultivation are rarely productive to the full extent of their ability. To enable us to receive the greatest advantage from the resources surrounding us, there is every need that the portion of the community engaged in farming shall be provided with the best machinery of agriculture. This does not consist merely in the seeders that assist in sewing; the self-binders assist in reaping; nor the steam threshers that separate the wheat from the chaff. To obtain sale for his produce at the highest price is equally important, for the farmer, with raising his produce cheaply and of the best quality. The former, however, is a matter which the farmers have too long neglected, too long left to the good will of others. The real market of the Canadian farmer is not the railway station or country town where he delivers his produce. The price of the article is fixed at the great distributing centres in accordance with the law of supply and demand. The amount received by the farmer is the price at the distributing centres, less the cost of transportation. To realize increased profits, the farmer must produce more cheaply and transport more cheaply. The first part of the carriage is entirely in the farmer's hands. The first link in the chain of transportation over the country roads is abnormally expensive and inefficient. To remedy this is to assist very materially in improving agricultural conditions, and in a great measure increase the prosperity of the country as a whole. There is not an industry nor profession which would not be benefitted by good roads, for the basis of Canada's wealth is agriculture.

WAGON TIRES AND ROADS.

The Ingersoll Sun contributes the following very pertinent item on the question of good roads. There is not doubt at all but wide tires must be adopted before permanent roadmaking will be a success. The Sun says:

It does not require a profound knowledge of natural philosophy to prove that wide tires on heavy wagons are preferable to narrow ones, though some people who never reason the matter out logically will contend that a loaded wagon with narrow tires is easier to draw than one with wide tires. Theoretically they may be right, under certain specific conditions, not usually present in actual practice but practically they are almost invariably wrong.

People must act on conditions as they exist and try to improve them. Existing conditions are invariably bad roads, soft and yielding during the spring and fall, and easily cut up by the passage of heavy loaded wagons over them. Narrow tires cut in deep and leave the roads in a horrible condition, while wide tires would pack the mud and gravel firm and smooth, thus improving the surface of the roads.

Casual observation will clearly demonstrate that a wheel cutting down three or four inches in the mud has a great deal of resistance to overcome in front, besides the resistance offered by the adhesion of mud on the portion of the wheel that is being raised from the road by its revolution on the axle. A practical test of this may be illustrated by pushing a loaded wheelbarrow over a piece of soft garden and then on a plank.

The question of good roads has occupied a good deal of attention, in the press, the Legislature, and municipal councils during the past two years, but the tire question ought to be brought more prominently into consideration as a means of road improvement and preservation,' as a matter of farm economy.

To bicyclists especially the use of wide tires would be a great boon as it would prevent the formation of deep ruts, and would act as rollers on the surface of the roads, making them much smoother, safer and speedier.

Let all unite in an active campaign to advocate the general use of wide tires on all kinds of wagons used for hauling heavy loads.—Canadian Wheelman.

HIGHWAY DRAINAGE.

There is one fault frequently committed in the use of the road machine; there is an insufficient escape allowed for water. Those who operate these machines object to being bothered by bars, or so-called "thank you, marms." So these are not being put in their places as they should be.

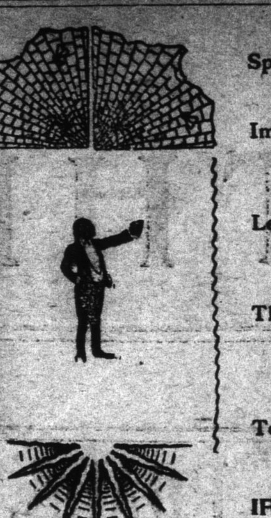
If there is a short sag to be filled, it can probably be done from material at the sides by using drag scrapers, then dress up with a road machine, or if the soil is a stiff clay or muck, haul on gravel, rock, shale or sand, if they are available. If not, the embankment should be raised to an extra height to give a quick drainage.

The worst feature in the working of the roads is that they are made the gutters of the country.

The ditch on the upper side of the road gathers all the water from the fields above the road and carries it to the foot of the hill; the ditch on the lower side gathers all the water coming from the road, and between the two our road system is being washed out.

Drainage can and should be provided to get the water outside of the road limits at short intervals. Water is a poor road material. Keep it from getting on the roads where possible.—Leader, Kenyon, Mich.

Go out into the highways and byways and preach Good Roads.



DO YOU WANT

Special attention and often reduced rates at good hotels?

WOULD YOU PREFER

Improved roads, better streets and more scientific care of them?

DO YOU REQUIRE

Legal protection, should your rights as a cyclist be infringed?

COULD YOU ENJOY

The fortnightly receipt of a bright illustrated cycling paper—the very best paper in Canada devoted to any branch of athletics?

WOULD YOU LIKE

To receive courtesies from the best wheelmen in any town you visit—to be a guest at the great Dominion and Provincial Meets held every year?

IF SO, Join the Canadian Wheelmen's Association.

BAD ROADS.

Why We Should Have Them—How to Make Them.

There is an absurd idea gaining ground here and elsewhere that better roads would be advantageous, and that the present methods of building and maintaining them are out of date. In every age and in every country there has been a class of agitators, disgruntled, dissatisfied, endeavoring to overthrow existing conditions. In Russia there are Nihilists, who rebel against the tyranny of the Czar; Spain is at present disturbed by Cuban patriots; in Canada there are road reformers. The last mentioned are turbulent, obnoxious and aim at a state of anarchy.

Bad roads are in every way desirable. They kill time. Farmers have too much time hanging on their hands. They don't know what to do with it at all. Time is money. Farmers have so much money, usually, that they can afford to kill time. They have time to burn. But they don't burn their money—just time.

We have enjoyed the benefits of bad roads so long that if they were converted into good roads we wouldn't know how to use them. Every farmer would be as uncomfortable as a Fiji Islander wearing a new suit of clothes and a fur overcoat. How they would perspire! In the meanwhile the horses perspire.

Bad roads kill horses and help to keep up the price. Good roads would encourage fast driving and would thereby encourage cruelty to horses. Fast driving is very immoral. With good roads every farmer's son would own a nice top buggy, and would be able to keep it clean long enough to drive into town; and they would want to spend half of their time in town. Bad roads keep them at home. They have to "stick to the farm" because the farm sticks to them.

These are a few of the reasons why we want bad roads. But it does not complete the list by any means. There are many other matters respecting commerce, society and civilization, which we have not space to even suggest. Of course, if they have been applied, in principle, to other matters beside roads, we would still be without the printing press and steam railway. We would be without religious and educational institutions. There would be no progress, no civilization. The savages of Central Africa would send missionaries to us.

Still it is evident that we want bad roads. In making them, the first point to observe is that water should be kept in the road as much as possible. Dig trenches along each side of the wagon track, but do not provide a fall, or outlets, to carry water out of the trenches, otherwise they will be drains. These trenches should hold water and permit it to soak into the roadbed, keeping it soft. If the surface of the road should by any means get dry, the tires of vehicles will easily break through the crust and sink into the soft foundation.

The dirt from these trenches, composed of sod and clay, should be thrown into the centre of the road, so as to secure a good depth of mud. By keeping the roadway flat on the surface there will be little danger of aiding drainage to any extent by the greater height of the centre. The sod, too, will decay, and is excellent to keep a road in a muddy condition.

If gravel must be used on the road, choose a quality containing plenty of sand and clay. This will retain moisture, and will yield easily under traffic in wet weather. There should be plenty of big stones to roll around under the feet of the horses and the wheels of the vehicle. A rotten culvert, standing a foot or so above the surface of the road is almost necessary for the making of a bad road in its ideal state. They break the monotony, carriages and horse's legs.

A road-grader is a good thing with which to make bad roads, although in the hands of an unscrupulous person it may also be employed in making a good road. Care should be taken to choose an operator who doesn't know how to make a good road, and the chances are that he will be successful in producing a bad one. Do not keep one man constantly employed on it, but pass it around for every one and any one to try his hand on. It is just like a plow in this respect. Do not get an experienced man in the first instance, and see that no one gets any experience. When using it on a gravel road always turn the dirt and sod from the shoulders of the road, and the ditches into the centre of the road. If gravel can be covered by this means let the maker of the bad roads wear a blissful smile. He has crowned his efforts with success. If the gravel road was previously good, it will be ruined by this treatment.

Use narrow tires. Wide tires have a tendency to keep the surface smooth. Narrow tires cut into the road, and are harder for the horses to pull, but the man who has the interests of bad roads truly at heart must not hesitate. Besides the horses have to do the pulling. The driver can sit on top of the load and smoke. What use are good roads, anyway? We must have time to smoke.

If these few principles are carefully followed out our roads will remain pretty much as they are at present for a number of years.—Municipal World.

The condition of the road is the price tag that tells the value of the farm.

GOOD ROADS IN QUEBEC.

The second annual meeting of the Good Roads Association of the district of Bedford was held in Sweetsburg on the 6th of January last. The convention was largely attended and was most successful. A motion declaring in favor of abolishing statue labor was carried, and by another motion, the association expressed its approval of the policy of the Quebec Government in assisting county councils to purchase road-making machinery. The president of the association, Hon. W. W. Lynch, judge for the superior court for the district, in the course of his opening address, a most eloquent appeal on behalf of good roads said:

"I frankly confess that I have learnt, from very brief and hasty investigation of this subject, that we are not as badly off in comparison with others as I had supposed we were; that we are not alone in the effort to improve our highways, and that there are others who are encountering the same difficulties which beset us in this effort, and the fact that in the great, wealthy and prosperous Province of Ontario all the roads are not just what they should be, and that in 1890 it became necessary to commission our friend, Mr. Campbell, to go, not alone to the back settlements, but to prosperous villages, towns and even cities and preach the gospel of better roads to the inhabitants, and it would appear that notwithstanding the advanced education of the people, the persuasive and captivating eloquence of our friend, he is not always equal to the task of convincing the ratepayers that in their own interests road improvement is necessary and desirable. The same experience meets the road reformer in the Provinces down by the sea. But what was my amazement to discover that the same complaints, the same agitation and the same lukewarmness exists in all of the States of the American Union from Vermont to Georgia, from Dakota to New York. The Lieutenant-Governor of the state of New York in a speech made on the 5th of July last said: "Legislation directed to the encouragement of good roads failed during the legislative session of 1897 because of the opposition of the farm-owners of the State, who naturally prefer to make the road running through their farms themselves rather than to pay what is required for some department of the State to do it. We all know that the making of good roads requires a careful study of the subject, and practical experience, such as most of the farmers do not possess. I believe that almost every farmer will save in the cost of getting his produce to market a sum greater than his individual tax by the substitution of good roads for the very poor ones so prevalent throughout the Empire State." New Jersey, which is said to have made the greatest progress in road improvement of any of the States has a Good Roads Association whose motto is "good roads decrease taxation, decrease living expenses, increase property values, increase farmers' incomes, increase railroad business, and promote prosperity and civilization." By the law of that State the cost of building the principal thoroughfares is placed one-third on the State, one-third on the abutting land-owners, and the remainder on the county. In sixty-two years $1,400,000 was expended in the building of 300 miles of permanent road, of which the State paid one-third. The movement has acquired such dimensions and assumed such proportions that the National Government of the United States has taken hold of it, and has established a road enquiry division in connection with the Department of Agriculture under the direction of General Stone. Its work is educational, by means of bulletins issued from time to time, and by the construction of sample roads in different parts of the States.

I have no hesitation in concluding that our roads are not as bad as they might be, and if they are not worse, it is not altogether the fault of those, in many instances, who have charge of them. But they should be infinitely better than they are, and with a little effort they can easily be made so. With the exception of the western and northeastern sections of the district, the soil except in places, is admirably adapted to road construction, and under intelligent direction, there exists no good reason why our roads at all seasons of the year should not be put on a footing to compare favorably with roads in any part of the world.—Canadian Wheelman.

OUR ROADS.

In summer season rather nice,
In winter time one glare of ice,
In spring and autumn nothing less
Than concentrated cussedness.

Quit patching the road all to pieces. Build it right.

Muddy crossroads, man in hurry,
Slow descent, obituary.

A wide tire maketh a smooth road, but a narrow tire rippeth up the high way.

No community can cut down its taxes by cutting up its highways with narrow tired waggons.

Old King Cole
Was a merry old soul
A merry old soul was he,
For he wasn't afraid,
But he called for his spade,
And repaired every road he could see.

APPLICATION FOR MEMBERSHIP IN THE C. W. A.

To H. B. DONLY, Simcoe, Secretary-Treasurer, C. W. A.

DEAR SIR:—Enclosed you will find $1.00, for membership in the Canadian Wheelmen's Association, to which I hereby apply for admission. I declare myself to be an amateur within the meaning of the Definition of the C. W. A. I refer to the undermentioned persons.

....
Signature.

Address..

Club.. If any

Date..

References..

If parties referred to are members of the C. W. A. two are required; if they are not then there must be three.

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