

WHEN BUILDING A GRAVEL ROAD

Use No Stone That Is Larger Than a Walnut.

ALWAYS NEEDS ATTENTION.

From the Very Instant of Completion Either Gravel or Stone Road Begins to Deteriorate, and the Longer It Is Neglected the More It Will Cost to Repair.

Following is an extract from "The Maintenance of Gravel and Broken Stone Roads," written by Daniel N. Lutten, Purdue University, Lafayette, Ind., in State's Duty:

"The gravel used should contain no stone larger than a walnut and should contain not more than 40 per cent of fine material, which may consist of sand and clay in about equal



WORN GRAVEL ROAD. [Courtesy Good Roads, New York.]

proportions. At least 20 per cent of fine material must be present for cementing purposes and to help make the gravel impervious to water.

A Test.

"If after a hard winter's frost the sides of a gravel pit remain steep without caving it may be taken as a satisfactory test that that gravel is a suitable road material.

"When a business man invests money in a business project, such, for instance, as the purchase of houses for renting, he finds it to his interest to keep those houses in good repair. If the roof begins to leak it must be attended to at once or the interior may be ruined. If furnace or chimney flues become defective they must be repaired before the dwelling is endangered by fire. So it should be with our highways. A good road surface must not only support loads, but it must act as a roof to shield the softer foundation from moisture. A leak in the surface of a road may be as disastrous to the capital invested as a leak in the roof of a dwelling."

Road Deteriorates.

"From the very instant of completion of either a gravel or stone road, that road begins to deteriorate, and the longer it is neglected the more rapid will be the loss, due to lack of maintenance. What such roads need



GRAVEL ROAD WELL MAINTAINED. [Courtesy Good Roads, New York.]

is not a great amount of new material to replace the wear due to traffic, but attention and labor. Fifty cubic yards of gravel or stone will replace material worn from one mile by a year's traffic.

"The gravel or stone should be applied in small quantities and only when the road is hard. It should be applied upon the low spots, care being taken to keep the center of the road always crowned and all chucks holes and ruts filled and leveled. Whenever water is found standing upon the road that spots need new road material and it should be applied before the water dries off. The aim should be to keep the road in such shape that there would be no opportunity for water to stand upon any portion of the road surface. It should have a ready means of escape to the side ditches, and then should escape from ditches before it has time to saturate the foundation."

"The sand and oil roads of California are said to be waterproof."

DUST LAYING.

Oil Used by Canadian Town to Sprinkle Streets.

Consul Augustus G. Seyfert of Owen Sound, Ont., says that "the sandy lake shore soil upon which Owen Sound is located results in very dusty streets. No matter how much rain falls or how much water is sprinkled on the streets in an hour thereafter the dust becomes a nuisance and a menace to health. To overcome this the municipal authorities experimented with oil, which proved such a success that now all the principal streets in the town are oiled. These thoroughfares are macadamized and are first swept clean and the oil put on immediately after with the sprinkler.

"The objection at first was that the odor from the crude oil was offensive, but in a day or two this disappeared, and the change for the better to dustless streets was recognized by all. The first application of oil lasted six weeks, and the second application was put on the other day, and what were some of the dustiest streets are now perfectly dustless.

"The town officials state that it will be an annual saving of \$2,000 over the old water system and at the same time give much better results."

"There are no slums in the country, no ward heekers, no dives, no houses of infamy, no schools of crime. But there are indescribably awful roads, especially in the winter."

GRADES ON HIGHWAYS.

Three or Four Per Cent Slope Advisable For Heavy Traffic.

A 1 per cent grade on a road means a rise of one foot for each hundred feet of distance traveled up the hill. A 10 per cent grade means ten feet rise in each hundred feet so traveled. A 1 per cent grade, then, means that in traveling uphill one mile an ascent is made of 52.8 feet, while a 10 per cent grade means a rise in altitude of 528 feet in a mile. Accurate tests have shown that a horse which can pull 1,000 pounds on a level road can pull only 810 pounds on a rise of one foot in fifty, and on a rise of one foot in ten he can pull only 250 pounds. These facts show that the greatest load that can be hauled over a road is the load which can be taken up the steepest hill on that road or through the deepest mudhole. It is therefore advised that all highways traveled by heavily loaded vehicles should be kept within a 3 or 4 per cent grade if practicable. To do this may require a change of location to get around hills, always keeping in mind that the lower the grade the larger the load may be hauled and the cost of hauling kept at the lowest point.

Good roads are the earmarks of civilization, the emblem of intelligence, education and refinement, whereas bad roads are the sign of backwardness, indolence and indifferent citizenship.

ONE WAY TO BETTER ROADS.

Automobile Club Gives Free Drags to Farmers.

A plan inaugurated several months ago by the Manhattan (Kan.) Motor club has been successful in bettering the condition of the country roads in a radius of ten miles from Manhattan at least 50 per cent, and the plan is so inexpensive that the club is urging other towns to take it up.

The club gives a road drag to every farmer who will guarantee to use it to keep three miles of road in good condition. The club has given away more than forty drags and is getting calls for them at the rate of about four a week.

The club first made the offer several months ago. The farmers were slow in taking advantage of it, but a few days ago the club's president, Dr. J. D. Coit, advertised the offer in the local newspapers, and the result has been that the drags are being taken by the farmers as fast as the club can get them made. The club has placed no limit on the territory in which the offer is made, and the drags are in use in all sections of the county. They cost the club about \$4 each.

Are you in favor of good roads? If not you don't belong to this age of the world and this town is no place for you.

Tar on English Roads.

The county surveyors in England have reported that the farring of roads has resulted in a saving of 20 to 25 per cent of the cost of the road maintenance. The average cost of spreading with tar is \$125 per mile. Experienced men say that it pays to spread this much for tarring the roads that cost \$750 to \$1,000 per mile a year for maintenance. Nothing more satisfactory than tar has been found. Two methods are used in applying it. If the road is resurfaced the material is previously saturated with tar. On roads that are not used too much such treatment will last five or six years. The other system is to spread hot tar on the surface, and this has proved to be more than a dust protector. It makes the road waterproof and binds together the material, making it more resistant to water, wheels and hoofs.

The Scrap Book

Willing to Help.

"When I was a young fellow, just beginning the practice of law," said Magistrate House, "two of the oddest characters about the courts were the Cohen brothers, David and Philip. They had a habit of appearing on the opposite sides of the same case. One day when Chief Justice Shay called the calendar in the city court David Cohen answered 'Ready' for the plaintiff in one case, and immediately Philip Cohen answered 'Ready' for the defendant. On the second call David again answered 'Ready,' but Philip answered 'Not ready.' This caused Justice Shaw to say: 'Why, Philip Cohen, fifteen minutes ago you were ready. How is it that you are not ready now?' 'May I please your honor,' replied Philip Cohen, 'I was ready when you first called the calendar, but since then I have learned that my brother David has fifteen witnesses in court, and I have only twelve. I should like an adjournment so that I may be able to go out and get three more witnesses.' 'Whereupon opposite Brother David, saying: 'May it please your honor, if that is all that is worrying my brother Philip the case can go on. I will lend him three of my witnesses.'—New York World.

Borrow.

Count each affliction, whether light or grave. God's messenger sent down to thee. Do thou With courtesy receive him. Rise and bow And see his shadow pale the threshold cross. Permission first his heavenly feet to have. Then lay before him all thou hast. Allow No cloud of passion to madden thy brow Or mar the hospitality to wave Of mortal hand to administer. The soul's maternal business. Grief should be. Like joy, majestic, equable, sedate. Confining, cleansing, raising, snatching free. Strive to consume small troubles, to commend Great thoughts, grave thoughts, thoughts lasting to the end. —Aubrey de Vere.

A Familiar Warning.

Mrs. Jones' favorite warning to her young progeny when they were in mischief was that she would tend to them in a minute. "Teaching" was accomplished by applying her open hand where it would do the most good. When Harry was four years old he was sent for the first time round the corner to the grocery. In a few minutes he came trotting adroitly back with the nickel still in his hand, but no bag of onions.

"What's the matter?" asked his mother.

"I'm 'fraid of the man," he said solemnly.

"Oh, he won't hurt you," reassured Mrs. Jones. "Run along and bring the onions. I'm in a hurry for them."

A second time Harry disappeared round the corner and a second time returned without his purchase.

"I'm 'fraid of the grocer man," he explained as before.

"Well, what makes you 'fraid of him?" demanded his mother impatiently.

"Why," answered the little fellow, "bide times when I peep in he looked at me an' said, 'I'll tend to you in a minute.'"

A Confession.

The late Father Ducey was once eagerly sought, while hearing confessions, by an enterprising reporter for a New York newspaper.

There was a long line of penitents in the church, and the reporter saw that the only way to get a speedy hearing would be to get a place in the line.

At last his turn came. "Father Ducey," he began, "I'm a reporter for the New York Daily Herald."

"My son," interrupted the cleric, "even that might be forgotten."

Admitted His Foolishness.

It was in Carme Payton's younger days as a manager, when his highly interesting eccentricities were beginning to distinguish him. He had appeared in a small city with his company and was already indulging his habit of making speeches before the crowd. The editor of the leading paper in the town attended the performance, after which, in the suppliant manner of his kind, he went forth and wrote a biting piece for his paper, which may be called the Herald.

"Carme Payton" wrote the editor, "is a fool. He looks like a fool and acts like a fool."

This, thought the editor, will embarrass Carme Payton, who will be careful hereafter how he acts.

Yet the next day the billboards bore bills in this wise:

"Carme Payton is a fool.—Herald.

"Of course Carme Payton is a fool for giving a dollar show for 10, 20 and 30 cents."

Scotch Stories.

It was late in the afternoon when the Scotch minister arrived at the farmhouse. The homeward-bound wife suggested that perhaps he would like a cup of tea before engaging in "exercises." "Na, na," said he, "I aye tak' my tea better when my work is done. I'll just be gonn on. Ye can hing the pan on an' leave the door ajar, an' I'll draw to a close in the prayer when I hear the ham fista."

Another woman of Scotland when asked if she had understood the sermon to which she had just been listening replied, "Wad I hae the presumption?"

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