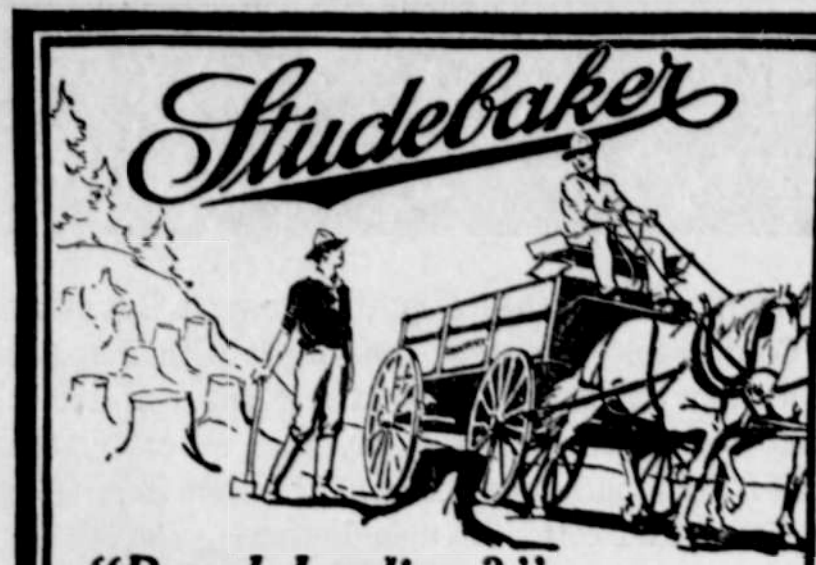




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Within a 15 mile circle around IMPERIAL there are now several hundred prosperous farmers raising enormous crops of wheat, rye, barley, oats, potatoes, vegetables, etc. Poultry raising is also highly successful. Three large stock ranches, owning several thousand horses and cattle are also in this circle. IMPERIAL is now the trading point and will soon be the shipping point (the railroads are now building) for the products from thousands of acres surrounding it.

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Concrete Roads Cheap; Durable

University of Oregon Discovers Method Adaptable to This County at Small Cost.

(Franklin Allen in Eugene Register.) The engineering department of the University of Oregon has just completed an investigation showing that Oregon can build concrete roads, surfaced with a bituminous coat at actually less than is now being paid for macadam road construction. This newly discovered system, if it is taken advantage of, will give Lane county roads similar to Eugene's paved streets at a cost at least equivalent—possibly even less—than macadam highways like that between Eugene and Springfield or between here and Santa Clara. And these concrete roads will have a life that practically has no limit, and a maintenance cost that will consist merely in recoating, at a cost of a few cents a yard, the top dressing every four or five years. This is to be contrasted with the fact that a macadam road must be rebuilt from every three to 10 years, at least the maintenance over a period of years soon equals the cost of original construction.

At present water bound macadam road, that which Eugene residence streets are paved with if not entirely mud, costs, including a 10 year average for maintenance about \$1.051 a square yard. Professor McAllister, after a series of experiment tests, has found components in the Willamette valley soil which can be mixed with concrete, serve as a substitute and save almost half the concrete cost. Using this, he shows in a comprehensive report, to be made public in a couple of weeks, that concrete highways, permanent and immune to auto-traffic and heavy hauling, can be constructed for 95c a square yard, including a 10 year period of maintenance.

Judge Thompson Pleased. "If the university has discovered a method of building fairly permanent roads at a moderate cost it will be the greatest boon to Lane County, in fact, to the entire state, that we have ever known," declared Helms W. Thompson, Lane county judge and good roads enthusiast, when told of the results of the investigation.

The university's discovery means much for Eugene also. If hard surface can be constructed for less than a dollar a square yard, as Professor McAllister has figures to prove, it will make possible the hard-surfacing of virtually the entire residence district.

"Puzzolan" is New Material. "Puzzolan," a volcanic material, is the element which is to solve the problem of bringing concrete roads to a practical cost, and which is well distributed in Oregon. The proportion with which it can be mixed with concrete varies upon the locality. That which Professor McAllister has designated as "Eugene puzzolan" is found abundantly around Eugene and throughout the Willamette valley. Another type exists near Grants Pass; artificial puzzolan can be made from blast furnace slag from Oswego; still another form is termed "diatomaceous earth," found near Eugene.

The great factor in favor of using a local material in place of cement is not necessarily the cost of the cement saved; but the cost of transportation of the cement is an important item. The cost of cement in Eugene in car-load lots is \$2.38 a barrel, net. Allowing for a three mile haul from the railroad to road plant the cost rises to \$2.48 a barrel. Figuring at this cost for cement, the cost for the blended cement is as follows:

Cement, .53 of barrel, at \$2.48, \$1.315
Total cost of blend cement,38

Cost of blend cement per barrel, \$1.695

The use of substances similar to "puzzolan" is not new. Los Angeles used a volcanic substance called "tufa" in the construction of its great 250-mile concrete aqueduct, in which 1,500,000 barrels of cement, or enough for 1020 miles of 15-foot concrete road, were used.

The German government after prohibiting similar blends permitted their use on concrete construction, following elaborate tests. The important consideration for Oregon is that the proper substances have been found to exist in large quantities all over the state; and furthermore analysis shows that Oregon's supply is of a very high quality. Macadam pavement is rapidly falling into disfavor all over the country. The state of New York has put millions of dollars upon macadam roads; but a few months ago in a popular election \$50,000,000 was voted which will be used in tearing up the macadam roads and replacing with concrete. A curious fact is that macadam roads were the factors which made possible the adoption of tower traction, including mechanical trucks and automobiles to the country; and now it is the mechanical transportation agents which are tearing macadam to pieces and necessitating a heavier type of road construction, this eventually to be concrete.

Macadam Upkeep Expensive. Macadam roads in Oregon, particu-

larly in Lane county, cost to lay 51.3 cents a square yard; in Massachusetts, not including contractor's profit estimated at 20 per cent, six-inch macadam cost \$4.7 cents; and in New York the same costs 57 cents. But the upkeep is the expensive feature of such roads. Of course this varies under local conditions. Estimates range 6.82 cents per square yard per annum to 36 cents a yard.

The annual cost of maintenance of macadam in Paris is said to be one-third of the cost each year. This is to say a macadam road must be rebuilt every three years. The figures, collected by the United States office of public roads make the average cost of maintenance in this country 5.7 cents a yard a year; and double this for bituminous macadam.

"Maintenance figures published only a few years ago now appear ludicrous," declared Dr. McAllister. "Massachusetts thought that they would be able to maintain their macadam roads indefinitely at 2.3 cents; in three years the cost has soared to 5.7 cents, and now the attempt to maintain macadam roads has been practically abandoned, and all sorts of surfaces, patented and otherwise, are being tried out in the hope of saving some of the many millions of dollars which the state has put into macadam roads."

"The mileage of improved roads in Oregon is relatively insignificant. Traffic is small because no large traffic is possible, thus maintenance here is still low. But with the expected development of the state it is safe to say that within the next five years the figures here will have passed the cost reached in so many other places."

Cost Compared. "It is my purpose to compare the cost of concrete with that of macadam. Four inches of concrete will withstand a greater strength than six inches of macadam. On the average, where traffic is not unusually congested four inches of concrete is sufficient."

"Personally I favor a concrete base, with bituminous wearing surface, as adopted by New York and California, but I am also prepared to give an estimate for a two-course type of all-concrete road."

"Taking conditions in Eugene as typical of local conditions, including all items of sand, cement, blend, mixing, stone, freight charges, hauling, protection, we obtain \$5.66 as the total cost of rammed concrete. One cubic yard will lay nine square yards, thus the cost of the concrete per square yard is 63 cents. "The cost of the bituminous part being a heavy asphalt. This price includes the cost of oil, freight, hauling, heating, spreading and the cost of stone screenings, sand, hauling and spreading the same in fact the total cost of the surface coat. At least this is what is paid in California; and the additional cost of freight to Oregon would possibly increase this cost to 6.5 cents at the most. Add this to the cost of the concrete and you have the total cost of the surfaced pavement, 69.5.

The Length of Life Not Known. "The length of life of this surface cannot be definitely stated; in the east the life of similar surfaces is not less than five years. But to be safe, I have cut this time in two, and assume that the road must be resurfaced every two and a half years; an improbable supposition. This will give a definite maintenance of 2.6 cents a yard per year. On the basis of the average cost and maintenance of macadam compare it with the concrete.

	Macadam	Concrete
First cost	\$0.540	\$0.695
Upkeep for 10 year period	0.511	0.260
Total per square yard	\$1.051	\$0.955

"This indicates saving of 9.6 cents per square yard in favor of the concrete type over macadam, or \$845 per mile of 15-foot road. If cement were used without blending, the saving would be wiped out but even then the concrete road would still compete with macadam road."

"Another type of road work of consideration has a concrete base; and also a concrete wearing surface of a richer mixture than the base. The use of the blended cement for the wearing surface I do not recommend, for its resistance to abrasion has not yet been determined. Until I can determine this I recommend the use of Portland cement without blending 1 1/2 inches thick. The proposition would be 1:2:34, which is a mixture adapted to concrete roads in Illinois. I consider the price of sand mortar for a wearing course objectionable.

"The cost of such a wearing surface laid in Eugene would be 31.6 cents a yard but the cost of maintenance would be very low. Considering 10-year periods this type of concrete pavement could easily compete with macadam. "Bituminous macadam in Oregon would cost more than concrete. Oiling the surface of existing roads, treat-

ment with calcium chloride and various emulsions or with tar have their merits in the way of cheapness and temporary relief, but do not seem desirable to adopt as a permanent policy of road improvement.

Bread and Butter Question. "This is not a matter of pleasure vehicles and picnic parties. It is an issue of bread and butter. Many millions of dollars in mud taxes—the cost of 10 to 39 cents per ton mile for hauling is a mud tax which Sam Hill declares makes the tariff a joke in comparison—are coming either out of people's mouths or out of their pocket books, depending upon whether they go without food or pay too much for it. Good roads will lift this mud tax, will lower the high cost of living more than any one factor, and will make community existence possible under new conditions."

"Community existence will be possible without having the people huddled together with an ever increasing tendency of the population toward cities."

"In view of the already rapid destruction of many well built macadam roads in Oregon, and in view of the universal conclusion that macadam is not adapted to modern traffic, such as motor trucks, road tractors and mechanical haulage generally, and in view of the fact that such traffic will in all probability be the prevailing traffic within a few years, believe that any large expenditures in the future construction of macadam would be unwise and result only in bitter disappointment."

NINETY THOUSAND LOOK AT OREGON PRODUCTS

More than 90,000 people throughout Indiana and Illinois have visited the Great Northern Railway's Montana-Oregon-Washington exhibition car the last ninety days. With a splendid display of grains, grasses, fruits and vegetables from the "Zone of Plenty" the car has attracted a great deal of attention and thousands of men, women and children have spent hours in a study of the exhibits of the products of the soil from three states of the American Northwest.

The exhibition car is proving a magnificent educational feature in the cities and towns visited and very often during the noon hour school teachers accompanied by entire classes have visited the car for first hand information about the Northwest. The fine grain samples, processed fruits and vegetables of various kinds have proved a source of interest.

Interest among the thousands of men who through the car in each place is the free government lands in Montana and Oregon. Many farmers in Indiana and Illinois are seriously thinking of moving to the Northwest where they may, in a few years, own their own farm instead of remaining in the central states on a rental basis with little prospect of ever owning the land they cultivate. Very few people in Indiana and Illinois have ever used their homestead right and the new three year law, requiring a residence of only seven months on the land each year for the three years, when a clear title is given, has set hundreds of farmers to seriously thinking about a home in Oregon or Montana where in a few years they will become independent.

Louis W. Hill, chairman of the board of directors of the Great Northern Railway, upon whose initiative the exhibition cars tour the central states each year, believes the farmers of the central states have a fine future on the government lands of Oregon, Washington and Montana and sends out the exhibition car with its miniature land show to give out truthful information about the three states where government lands are still to be had and about the great American Northwest in general.

While the people in the cities and towns in Indiana and Illinois where the exhibition car has made stops have read literature descriptive of the Northwest, a visit to the car where the products of the soil are so attractively displayed serves to corroborate the facts they have read in descriptive booklets. It is a visit to the Northwest to spend an hour in the Great Northern exhibition car.

Since the Great Northern has no land to sell and the information given out is reliable in every detail, and the exhibits a faithful display of what the soil has and will produce, the tour of the exhibition car has been successful. The itinerary calls for daily stops in Illinois until April 1.

The exhibition car has been visited by many farmers, some driving as far as twenty miles to view the soil products from the Northwest. Before the Oregon-Montana-Washington car reaches St. Paul it will have been visited by more than 120,000 people.

Stamped by the public, press and pulpits as the grandest and most gorgeous aggregation of its kind in the entire world the show will exhibit here presenting each and every one of the features as honestly advertised. It will be the only show of any importance exhibiting here this season bringing the latest and most up-to-date animal acts of America and Europe.

Look to Your Plumbing.
You know what happens in a plumbing condition—everybody in the house is liable to contract typhoid or some other fever. The digestive organs perform the same functions in the human body as the plumbing does in the house, and they should be kept in the best condition all the time. If you have any trouble with your digestion, get the Chamberlain's Tablets and you are certain to get quick relief. For sale by all dealers.

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There is no use of our "best" around the bush. We might as well out with it first as last. We want to try Chamberlain's Cough Remedy the next time you have a cough. There is no reason so far as we see why you should not do so. In preparation by its remarkable results has gained a world wide reputation and people everywhere speak of it in the highest terms of praise. For sale by all dealers.

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For Burns, Bruises and Sores.
The quickest and surest cure for burns, bruises, boils, sores, inflammation and all skin diseases is Buckner's Arnica Salve. In four days it cures H. Haffin of Iredell, Tex., of a sore on his ankle which pained him so he could hardly walk. Should be in every house. Only 25c. Recommended by all dealers.

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Coughs and colds, when neglected, always lead to serious trouble of the lungs. The wisest thing to do when you have a cold that troubles you is to get a bottle of Dr. King's New Discovery. You will get relief from the first dose, and finally the cough will disappear. O. H. Brown, of Muscogee, Ala., writes: "My wife was down in bed with an obstinate cough and I honestly believe had it not been for Dr. King's New Discovery, she would not be living today." Known for forty-three years as the best remedy for cough and colds. Price 50c per bottle. \$1.00. Recommended by all druggists.

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