

GRAVEL ROAD TYPES

Constitute About One-Third of Surfaced Roads in the United States.

BEST SELECTION OF GRAVEL

Quality of Material is Next in Importance to Proper Drainage—Clay is Poorest Cementing Material We Have.

(Prepared by the United States Department of Agriculture.)

Roads that are artificially surfaced with gravel, or with earthy material in the composition of which gravel predominates, are called gravel roads.

In the following discussion of gravel roads it is convenient to consider the subject under the two general heads, "Selection of Gravel" and "Construction Methods."

Selection of Gravel.

Ordinarily the selection of gravel for use in road surfacing must be confined to local materials which are or can be made suitable for that purpose.

Next to proper drainage, the most important thing in building gravel roads is to secure a good quality of gravel.

Gravels that come from the pit with the pebbles cemented together, even though they contain no clay, will recement in the road and become harder than they were in the pit.

In accordance with these suggestions, gravels are considered valuable for road purposes in the following order:

- 1. Almost in direct proportion to the percentage of pebbles constituting the mass.
2. In direct proportion to the value as road metal of the rock fragments constituting the pebbles.
3. In direct proportion to the value as a cementing material under all conditions of weather, of the finer particles of earthy matter constituting the filler or binder.

In general, the physical characteristics of gravel which determine its suitability for use in surfacing a road are:

- (1) The durability of the pebbles or rock fragments, (2) the quality of the binder, (3) the grading of the pebbles, and (4) the proportion in which the binder material is present.

Durability of Pebbles. The principal qualities which determine the durability of pebbles or

stone of any kind when placed in a road surface are hardness, toughness, and resistance to wear. The extent to which pebbles possess these qualities depends very largely on the character of the parent stone from which they were originally produced and accordingly varies over a wide range.

Ordinarily the most durable pebbles which occur in gravel deposits are those composed of either quartzite or chert, though many deposits contain fragments of limestone or trap rock, either of which may make an excellent road-surfacing material.

The Binder.

No matter how durable may be the pebbles contained in a given gravel deposit, they cannot be used successfully in a road surface unless they can be well bonded together so as to present a combined resistance to the disturbing action of traffic.

The principal cementing agent, or binder, present in most gravel deposits is clay, and in case of deposits which do not carry sufficient binder, clay usually is the material added to correct the deficiency.

The suitability of clay for use as a binder for a gravel road surface depends on exactly the same characteristics as its suitability for use in sand-clay construction.

Grading and Proportions.

For gravel to make a satisfactory road surface, the stone particles should be graded in size so that the amount of binder required will be reduced to a minimum.

In general, it has been found that satisfactory gravel will conform to the following limits as to percentages of fine and coarse material:

- 1. Material retained on a 3/4-inch sieve, 55 to 75 per cent.
2. Material retained on a 1/2-inch sieve, not less than 15 per cent.
3. Material (clay) passing a 200-mesh sieve for the surface course, 8 to 15 per cent.
4. Material (clay) passing a 200-mesh sieve for the foundation course, 10 to 15 per cent.

INTERNATIONAL SUNDAY SCHOOL LESSON

By REV. P. B. FITZWATER, D. D., Teacher of English Bible in the Moody Bible Institute of Chicago.

LESSON FOR SEPTEMBER 16 THE FIERY FURNACE.

LESSON TEXT—Daniel 3. GOLDEN TEXT—When thou walkest through the fire, thou shalt not be burned; neither shall the flame kindle upon thee.—Isaiah 43:2.

I. The Occasion (vv. 1-7). The fact that God said to Nebuchadnezzar, "Thou art this head of gold" (2:38) was too much for him.

II. The Behavior of the Hebrews (vv. 8-18). (1) The accusation by the envious spies (vv. 8-12). Daniel's three friends had been promoted to positions of honor and responsibility.

(2) The king's rage (vv. 13-15). He calls the Hebrews before him, questions them and gives them another chance.

(3) The courageous reply of the faithful Hebrews (vv. 16-18). They replied without passion or fear. The peace of God filled their hearts.

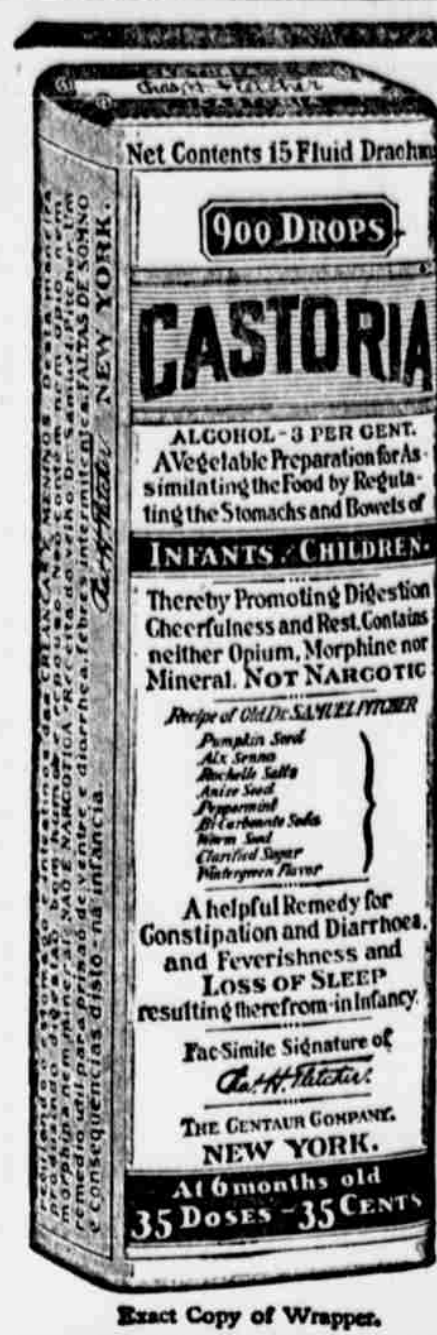
III. The Glorious Issue (vv. 19-30). (1) The harmless furnace (vv. 19-25). The infuriated king ordered the heat of the furnace to be intensified, his most mighty men to bind the Hebrews and fling them into the fire.

(2) The convinced king (vv. 26-28). The spectacle was so wonderful that the king called the Hebrews together out of the fire.

(3) The king's decree (v. 29). This was most foolish and wicked. Even a king has no right to kill people for not worshipping God.

(4) Promotion of the Hebrews (v. 30). Their fidelity in this trying ordeal resulted in their promotion instead of downfall.

(a) God alone is Lord of the conscience. One's faith and worship should be determined by the individual before his God.



Children Cry For Fletcher's CASTORIA. What is CASTORIA? Castoria is a harmless substitute for Castor Oil, Paregoric, Drops and Soothing Syrups. It is pleasant. It contains neither Opium, Morphine nor other narcotic substance.

Got a Line on Them. Two English laborers who were on the road to Birmingham to get work happened to meet an old Irishman breaking stones on the roadside.

SOOTHES ITCHING SCALPS And Prevents Falling Hair Do Cuticura Soap and Ointment.

On retiring, gently rub spots of dandruff and itching with Cuticura Ointment. Next morning shampoo with Cuticura Soap and hot water using plenty of Soap.

Good for the Liver. Spinach and dandelion used in small proportions daily for 21 days will correct liver complaints.

Our ideal of a true hero is the man who brings a friend home to dinner on washday.

No Amateur Stuff. "The Browns have invited us to dinner." "Good. I'd rather eat there than anywhere else."

Too Model. "I think you have a model apartment." "Yes; my husband says it's a model of the real thing."

The world makes way for the determined man.—D. S. Marden.

The Combined Fighters in France and Flanders and the Combined Harvesters in America WILL Bring the Allied Victory Nearer.

A reciprocal arrangement for the use of farm workers has been perfected between the Department of the Interior of Canada and the Departments of Labor and Agriculture of the United States.

HELP YOUR CANADIAN NEIGHBOURS WHEN YOUR OWN CROP IS HARVESTED!!! Canada Wants 40,000 Harvest Hands to Take Care of Its 13,000,000 ACRE WHEAT FIELD.

High Wages, Good Board, Comfortable Lodgings. An Identification Card issued at the boundary by a Canadian Immigration Officer will guarantee no trouble in returning to the United States.

Certain-teed Roofing. Certain-teed is tangible—something you can take hold of. It means certainty of quality and guaranteed satisfaction. Behind the name is the definite responsibility of a great business which has reached commanding position in its field because of its ability to manufacture and distribute the best quality products on the most efficient basis.