Home Course In Road Making

VI. — The Construction and Maintenance of Earth Roads.

By LOGAN WALLER PAGE,
Director Office of Public Roads, United States Department of Agriculture.

THERE are about 2,000,000 miles of earth roads in the United States, not including the roads in Alaska and our island possessions. In other words, we have enough earth roads in this country to reach around the earth at the equator eighty times, and, what is more, a very large percentage of these roads will remain as earth roads for a long time to come.

Our earth roads cannot be made to take the place of gravel or macadam, but with proper construction and adequate maintenance they can be greatly improved, and this can be accomplished without any considerable outlay of money. Good earth roads are within

PROPERLY CONSTRUCTED AND MAINTAINED EARTH ROAD.

the financial means of nearly every community in the country.

The opinion is quite general throughout the country that it is useless to try to do anything to improve our earth roads. This is a mistaken idea. In fact, a good earth road is the stepping stone to a macadam road. The earth road is the foundation for all future improvements. With proper plans for the future the earth road can be constructed at once. A comparatively small annual outlay for maintenance will then serve to keep it in shape until funds are available for further improvement with a hard surface.

One of the most frequent faults with our present earth roads is that they are located where they should not be. Grades are too often unnecessarily steep, drainage is poor or entirely lacking and streams are seldom crossed at the most favorable bridge site.

To relocate these roads entirely or even to a large extent is out of the question. The general location of the present roads must be maintained because of the farm improvements which have been made along them. But wonderful improvements can be made by modifying the location of short sections here and there. Instead of going over a steep hill it is often feasible to go around it on a much easier grade without materially increasing the distance.

The elimination of one or two steep hills on a line of road will frequently enable horses to draw three or four times as much to market as they could draw on the old road. It takes approximately four times as much power to draw loads on 10 per cent grades as on a level.

The earth road should have at least six hours of sunshine each day. Brush and trees which impede the drying action of the sun should be removed. The southern and western exposures should be as complete as possible. With gravel and macadam roads this is not so necessary, as a certain amount of moisture is needed to keep down the dust.

But comparatively few of our earth roads have been dignified by any improvement which could be termed construction. To expect a good earth road where none has ever been built is like expecting a harvest from ground which has never been tilled. An earth road must be built, just as a macadam or gravel road must be built, and skill and experience are required in order to secure the best results.

The first and last requisite in road construction is drainage. This, of course, must be modified to suit the conditions of soil and climate. Where the soil is heavy and retentive care must be taken to get rid of the water quickly and completely. For this purpose the roadway must be raised eighteen to thirty inches above the side ditches and well crowned, so that the water will flow freely to the side ditches. The side ditches should be of ample size and provided with sufficient fall to properly care for the heaviest rains. Ordinarily the only ditches needed are those made with a road scraper, which are wide and comparatively shallow.

Culverts of sufficient capacity should be provided at low places or for natural watercourses. Wood and terra cotta tile do not, as a general rule, make satisfactory culverts. The first will soon decay, and the latter is liable to break unless it is very carefully laid. Stone or concrete culverts are the best and cheapest in the long run. The main things to bear in mind in building culverts are that they should have sufficient capacity to quickly dispose of the maximum flow of rainwater and that they are given sufficient fall to keep themselves clean. Increased fall also increases the capacity, but if much fall is given the spillway should be paved and the outlet and intake protected with suitable wing walls.

All material subject to decay, such as sod, grass or weeds and vegetable mold, must be carefully excluded. The aim must always be to build a roadway as solid and impervious to moisture as possible. Water from every source, surface or underground, must be got rid of. Except in sandy or very arid regions, water is the great enemy of earth roads.

The earth road can best be crowned and ditched with a reversible road machine or scraper and not with picks and shovels, scoops and plows. One road scraper with suitable power and operator will do the work of many men with picks and shovels and do it better. The road scraper should be used when the soil is damp, so that the soil will pack and bake. If it is worked dry it takes more power to operate the machine, and, furthermore, dry earth and dust retain moisture and quickly rut after rains.

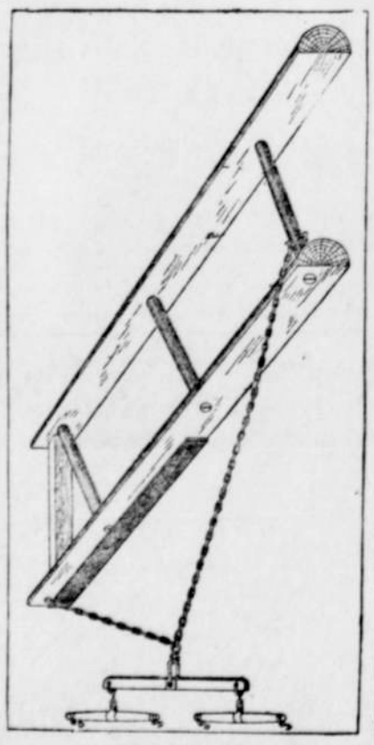
Shoulders are often formed on both sides of the road by constant travel in one place, which prevents storm water from flowing into side ditches, retaining it in the ruts and softening the roadway. These ruts and shoulders can usually be entirely eliminated by a judicious use of the split log drag.

The price of good roads is eternal vigilance in maintenance. This is perhaps even more true of earth roads than any other. The rains and melting snow soften the surface more or less, and passing traffic forms ruts and depressions. These, if allowed to remain, will retain more water at the next rain, and more mud and deeper ruts and larger depressions will be formed. It is self evident, therefore, that the main thing in maintaining heavy soil roads must be to keep the drainage good. For this purpose there is nothing which equals the split log drag or other similar devices.

The principle of the action of the drag is simply this: The clays and most heavy soils will puddle and set very hard if worked when wet. The drag is essentially a puddling machine. After each rain and while the earth is still plastic, but not sticky enough to adhere to the drag, one or two trips up and down the road are made with the drag. Only a small amount of earth is moved, just enough to fill the ruts and depressions and smooth over the surface with a thin layer of plastic clay, which packs very hard, so that the next rain, instead of finding ruts and depressions in which to collect, runs off, leaving the surface but little affected.

The time and labor involved in keeping an earth road properly dragged are small. Five dollars per mile per year seems to be about the average cost in the middle states. The essential requisite is that the work shall be done at the time it is needed. This is the point which seems hardest to impress on the average man. The little attention the earth road needs must be given promptly and at the proper time if the best results are to be obtained.

We have become so accustomed to the old habit of doing our road work at our convenience that we can hardly force ourselves to realize that anything else should be even suggested. One thing is absolutely certain, and that is that we will never have anything like improved earth roads until



SPLIT LOG DRAG.

we adopt a system of continuous maintenance. The amount of work required at the time is usually small, but it is imperative that it be done promptly or not only will the amount be large, but the roads will be bad for long periods of time.

When the traffic is not too heavy our earth road, when properly constructed and rightly maintained, can in general be kept fairly good most of the year and passable at all times. When the traffic is very heavy the earth road must give way to a hard surface, such as gravel, macadam, brick, etc. But even then a good earth road is a great gain, as it provides the foundation for the hard road.

[These articles and illustrations must not be reprinted without special permission.]

THE HOUDAN.

Hen historians have had a continuous rooster fight over the Houdans. Frenchmen claim to hold the patent on this poultry perfecto and are said to have made it by crossing Black Polish and the French Crevecoeur and touching this crossup with Light Brahma to give size. They declare they sent this breed to England in 1850, its first mention in English hen history being made in the 1853 edition of the English Poultry Book.

Johnny Bull resents this and swears he made his own Houdan of a cross of Dorking, the English "breed of breeds," and the French Crevecoeur.

But this isn't our cockfight, and we'll roost on the top perch and watch the scrap, though our private opinion is that the French, English and American Houdans aren't forty-

Photo by C. M. Barnitz.

HOUDAN COCKEREL.

second chicken kozens. The most of history is a pack of lies anyway, they say.

The Houdan came to this country in 1859 and was first exhibited by the famous John B. Gough in 1867.

"It ees ze fine, ze vera fine, bootiful fowl," says the Frenchman, and that's true.

It is a compactly built, full breasted, long bodied, short shanked, five toed, white meated bird; is hardy, easily confined, a nonsitter, small eater, quick grower, lays early and long, and its big white egg is a dandy.

Unlike humans, Mr. and Mrs. Houdan wear a beard that should be full and a crest that should be globular, large, well balanced on the head and falling backward on the neck.

In color the bird is mostly glossy black, one white tipped feather to every

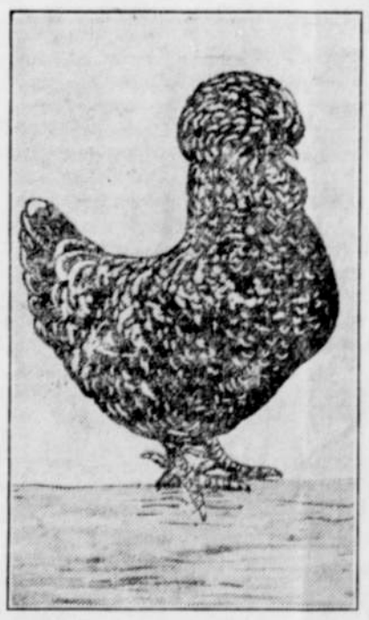


Photo by C. M. Barnitz.

HOUDAN HEN.

five black, except wing flights, secondaries, sickles and tail coverts, which have white edge.

The beak is dark horn; face, eyes, comb, wattles red; lobes white and shanks and toes pinkish white mottled with black.

In its checkered career the Houdon has worn the strawberry, butterfly, antler and V shaped combs, all made in France except the last, which was made and patented in America by Dr. James Rigg in 1872. The V comb is standard in the United States.

HOUDAN STANDARD WEIGHTS.

	Pounds.		Pounds.
Cock	7	Hen	6
Cockerel	6	Pullet	5

DON'TS.

Don't throw green corn nubbins to the hens. Throw them into the hog pens.

Don't delay to market young ducks when in top notch condition. They will drop from fit to nit.

ELECTRIC CURRENTS NO JOKE.

A new French system of electroculture consists simply in standing upright in the ground small iron rods with noncorrosible points, the theory being that these rods cause electric discharge from their points and create electric oscillations in the ground. For cereals quarter inch rods about six feet long are suggested. It is alleged that plants grown in the ground so electrified—spinach, strawberries, currants, green peas, etc.—are both earlier and better than others grown in neighboring plots having no rods.

Windows rubbed once a week with a cloth dipped in alcohol, says an exchange, will be free from frost in the coldest weather.

CLASSIFIED

WANTED

WANTED—Five good experienced strawberry pickers to camp for about four weeks. E. A. BAKER, Gresham. Phone 79. Route 3, Box 37 2 t

WANTED—To trade good double-hammerless shot gun with leather case, for bicycle with coaster brake. Must be in good condition. Call at J. C. Mount's furniture store.

WANTED—Good, clean cotton rags at ½c a pound. Mt. Scott Pub. Co.

WANTED—Boys may be had and sometimes girls. The older ones at ordinary wages and others to be schooled and cared for in return for slight services rendered. For particulars address W. T. Gardner, superintendent Boys and Girls Aid Society of Oregon, Portland, Ore. tf

Eggs for hatching, Calkins strain of pure bred white leghorns. Eggs for hatching balance of season $6.00 and $8.00 per hundred. Some stock for sale. Call Lents Home Phone 2924 or address Calkins Poultry Farm, Lents, Oregon, Gilberts Station. tf

FOR SALE

WOOD FOR SALE—4 foot wood at $4.00 and $5.00 per cord. Come and see it. Good coal delivered to your door. Moving, excavating and general transfer work. See W. A. HALL & SON, Phone Tabor 2888. Foster Road, Lents, Ore.

FOR SALE—New Tent house, with fly; floored and ceiled. Cheap for cash. C. F. HUNT, 9th. Ave. and Foster Road.

FOR SALE—Jersey cow giving 3½ gallons milk. Enquire of E. P. Smith, North Main St., Lents.

FOR SALE:—Plastering sand and gravel. Call Tabor 2063, R. Heyting, 45 Lincoln and Grays corner, Lents, Oregon. t s.

FOR SALE—All kinds of Rough and Dressed lumber at Reduced prices at our mill two miles from Kelso, Oregon. Lumber delivered. Sandy Ridge Lumber Co. Phone 41x1. Joel Jarl Mgr.

FOR SALE—Newspapers for wrapping or kindling. Mt. Scott Pub. Co.

LUMBER—At our new mill 1¼ miles southeast of Kelso. We deliver lumber. Jonsrud Bros. (-

FOR SALE—One fourth acre, cleared, in Walden Park. Five dollar payments. Enquire at Mt. Scott Publishing Co's. office.

LOST—Ladies round gold pin on 9th. Ave. between Marie and carline. Finder please return to Mrs. J.E Carter, 126 9th. avenue.

FOR RENT

DIRECTORY

PROFESSIONAL

There is more Catarrh in this section of the country than all other diseases put together, and until the last few years was supposed to be incurable. For a great many years doctors pronounced it a local disease and prescribed local remedies, and by constantly failing to cure with local treatment, pronounced it incurable. Science has proven Catarrh to be a constitutional disease, and therefore requires constitutional treatment. Hall's Catarrh Cure, manufactured by F. J. Cheney & Co., Toledo, Ohio, is the only Constitutional cure on the market. It is taken internally in doses from 10 drops to a teaspoonful. It acts directly on the blood and mucous surfaces of the system. They offer one hundred dollars for any case it fails to cure. Send for circulars and testimonials.

Address: F. J. CHENEY & CO., Toledo, O.
Sold by Druggists, 75c.
Take Hall's Family Pills for constipation.

EXECUTOR'S NOTICE

In the County Court of the State of Oregon, for Multnomah County.

In the Matter of the Estate of Peter Tulp, Deceased.

Notice is hereby given that the undersigned has been duly appointed by the County Court of the State of Oregon, for Multnomah County, executor of the last will and testament of Peter Tulp, deceased.

All persons having claims against said estate are hereby notified and required to present the same to me, properly verified as by law required, at the office of Kennedy & Klineman, Lents, Multnomah County, Oregon, within six months from the date hereof.

Dated this 9th day of May, 1912.

N. Girling,
Executor of the Estate of Peter Tulp, deceased.
W. F. Klineman,
Attorney for Executor.

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CHURCH DIRECTORY

(All churches are requested to send to The Herald notices, such as the following, for publication each week free.)

GERMAN EVANGELICAL LUTHERAN CHURCH—Grays Crossing, E. G. Hess, pastor Sunday School at 10:00. Service at 11:00. German School Saturday at 1:30.

CHURCH—Grays Crossing. E. G. Hess pastor Sunday School at 10:00. Service at 11:00. German School, Saturday 1:30.

ST. PAUL'S EPISCOPAL CHURCH, WOODMERE—Services and sermon at 4 p. m., every Sunday. Sunday School at 3:00 a. m. Communion service, on second Sunday of each month. Dr. Van Water and Rev. Oswald W. Taylor.

LENTS BAPTIST CHURCH—First Avenue, near Foster Road. Rev. J. N. Nelson pastor. Sunday School 10 a. m. Preaching 11 a. m., and 7:30 p. m. B. Y. P. U. meets at 6:30. Prayer meeting Thursday evening at 7:30.

SWEDISH LUTHERAN MEETING—Held every Sunday at 10:30 a. m., and in the evening at the Chapel at corner of Woodbine street and Firland avenue. Rev. B. S. Nystrom, pastor.

SWEDISH BETHANIA CHAPEL, ANABEL—Scandinavian Sunday School at 11 a. m., Bible study and prayer meeting Friday at 8 p. m. Scandinavian people cordially invited and welcome.

GRACE EVANGELICAL CHURCH, LENTS—Preaching Sunday at 11 a. m. and 7:30 p. m. Sunday School every Sunday at 10 a. m. Young Peoples' Alliance every Sunday at 6:30 p. m. Prayer meeting and Bible study each Wednesday evening. Special music. All cordially welcome. Rev. Conklin, pastor.

LENTS FRIENDS CHURCH—South Main St. Sabbath School 10:00 a. m. Service 11:00 a. m. Christian Endeavor 6:30 p. m., Evangelistic service 7:30. Prayer meeting Wednesday 7:45 p. m. Myra B. Smith, pastor.

LENTS M. E. CHURCH—Corner of 7th Ave. and Gorden St. Sunday School 10:00 a. m., Services at 11:00 a. m. and 7:30 p. m., Epworth League 6:30. Prayer meeting Thursday evening of each week. All most cordially invited. Rev. W. Boyd Moore, pastor.

TREMONT UNITED BRETHERN CHURCH—62nd Ave. 69th St. S. E. Sunday School at 10:00 a. m. Preaching 11:00 a. m. Christian Endeavor 6:30 p. m. Preaching 7:30 p. m. Prayer meeting Thursday 7:30 p. m. Mrs. Lynn, pastor.

MILLARD AVE. PRESBYTERIAN CHURCH Rev. Levi Johnson, pastor. Residence 692 1-2 Lovejoy St. Services: Sunday School at 10 a. m., Morning Worship 11 a. m.

SEVENTH DAY ADVENTIST CHTRCH—Saturday-Sabbath School 10 A M; Saturday-Preaching 11 A M; Sunday Preaching 8:00 P M; All welcome to these meetings. C. J. Cummings, Pastor, residence 98 East 45th St; Phone Tabor 3621.

GRANGE DIRECTORY

[Granges are requested to send to The Herald infomation so that a brief card can be run free under this heading. Send place, day and hour of meeting.]

PLEASANT VALLEY GRANGE No. 348 Meets second Saturday at 7:30 p. m., and fourth Saturday at 10:30 a. m. every month.

ROCKWOOD GRANGE—Meets the first Wednesday of each month at 8 p. m. and third Saturday at 10 a. m.

MULTNOMAH GRANGE, NO. 71.—Meets the fourth Saturday in every month at 10:30 a. m., in Grange hall, Orient.

FAIRVIEW GRANGE—Meets first Saturday and the third Friday of each month.

RUSSELLVILLE GRANGE, NO. 358—Meets in the schoolhouse the third Saturday of each month.

EVENING STAR GRANGE—Meets in their hall at South Mount Tabor on the first Saturday of each month at 10 a. m. All visitors are welcome.

GRESHAM GRANGE — Meets second Saturday in each month at 10:30 a. m.

DAMASCUS GRANGE, NO. 260.— Meets first Saturday each month.

LENTS GRANGE—Meets second Saturday of each month at 10:30 a. m.

CLACKAMAS GRANGE, NO. 298—Meets the first Saturday in the month at 10:30 a. m. and the third Saturday at 7:30 p. m.

SANDY GRANGE, No. 392. Meets second Saturday of each month at 10 o'clock a. m.

COLUMBIA GRANGE NO. 267.—Meets in all day session first Saturday in each month in grange hall near Corbett at 10 a. m.

CLACKAMAS GRANGE meets first Saturday of each month at 10:30 a. m., and third Saturday at 7:30 p. m.

RAILROAD TIME CARD

UNION DEPOT, NORTHERN PACIFIC
Phone A 6541, Main 6581
Leaves 7:10 a. m., 10:30 a. m, 3:30 p. m., 11:15 p.m.
Arrives 7:00 a. m., 3:30 p. m., 7:00 p. m., 10:20 p.m.

OREGON-WASHINGTON-SEATTLE
Phone A 6121, Private ex. 1
Leaves 8:30 a. m., 1:45 p. m., 3:00 p. m., 11:00 p.m.
Arrives 6:45 a. m., 2:30 p. m., 5:30 p. m., 6:30 p.m.

PENDLETON LOCAL
Leaves 7:50 a. m., arrives 5:30 a. m.

THE DALLES LOCAL
Leaves 4:00 p. m., arrives 10:00 a. m.

OVERLAND
Leaves 10:00 a. m., 8:50 p. m., arrives 12:45 a. m., 8:00 p. m.

SPOKANE
Leaves 9:00 p. m., arrives 11:30 a. m.

SOUTHERN PACIFIC
EUGENE PASSENGER
Leaves 6:30 p. m., arrives 11:00 a. m.

ASHLAND
Leaves 8:30 a. m., arrives 9:50 p. m.

ROSEBURG
Leaves 3:50 p. m., arrives 5:30 p. m.

CALIFORNIA TRAINS
Leave at 1:30 a. m., 5:50 p. m., 7:45 p. m.
Arrive at 7:30 a. m., 7:40 a. m., 2:30 p. m.

WEST SIDE
Corvallis, leave 7:30 a. m., arrive 6:20 p. m.
Hillsboro, leaves 7:20 a. m., 11 a. m. 4:00 p. m., 5:40 p. m.
Arrive 8:00 a. m., 10:20 a. m., 2:45 p. m., 4:10 p. m., 6:20 p. m.

JEFFERSON STREET
Dallas, leaves 7:40 a. m. arrives 5:45 p. m.

UNION DEPOT
Dallas, leaves 4:10 p. m., arrives 10:30 a. m.

SHERIDEN—UNION DEPOT
Leaves at 4:00 p. m., arrives 10:20 a. m.

TILLAMOOK
Leaves 8:45, Hillsboro, 10:00 Tillamook 4:35; leaves Tillamook 7:00 a. m., Hillsboro 1:40 p. m., arrives in Portland 2:45 p. m.

NORTH BANK
Phone A 6251, Marshall 920

ASTORIA
Leaves 8:00 a. m., 6:30 p m., arrives 10:25 p. m., 12:30 noon.

RANIER LOCAL
Leaves 1:00 p. m., 5:45 p. m., arrives 9:40 a. m., 5:00 p. m.

LYLE-GOLDENDALE
Leaves 8:20 a. m., arrives 6:00 p. m.

SPOKANE EXPRESS
Leaves 9:55 a. m., 7:00 p. m. arrives 8:00 a. m., 7:45 p. m.

COLUMBIA LOCAL
Leaves 5:30 p m., arrives 9:55 a. m.

ELECTRIC LINES
OREGON ELECTRIC
Salem and way points
Leaving at 7:35, 8:45, 10:45; 2:00, 3:45, 6:10, 8:55.
Arrives 8:45, 11:15; 1:30, 4:15, 5:25, 6:15, 8:20, 11:00

Hillsboro and Forest Grove
Leaves 6:40, 8:15, 10:35, 1:00, 3:15, 5:45, 8:15 11:25
Arrives 7:50, 10:00, 12:05, a. m., 2:40, 4:56, 7:40 9:35, 11:00 p. m.

UNITED RAILWAYS
Third and Stark, phone A 5591 Marshall 920
Leaving hourly from 6:15 a. m. to 5:15 p. m.
Arriving " " 7:55 a. m. to 6:55 p. m.

PORTLAND RAILWAY LIGHT & POWER
Alder St. station, A 6131, 6608 Main
Oregon City, arrives and leaves each half hour from 6:30 a. m. to midnight.
Cazadero, arrives and leaves 6:55, 8:45, 10:45 a. m., 12:45, 2:45, 4:45, 6:45 p. m., stopping at Troutdale, and Gresham, way points.
Gresham, Troutdale, leaves at 7:45, 9:45, 11:45 a. m., 1:45, 3:45, 5:45, 11:35 p. m.
Vancouver, station Washington and Second 6:15, 6:50, 7:25, 8:00, 8:35, 9:10, 9:50, 10:30, 11:50 a. m., 12:30, 1:10, 1:50, 2:30, 3:10, 3:50, 4:30, 5:10, 5:50, 6:30, 7:05, 7:40, 8:15, 9:25, 10:35 11:45.