

ROAD CONSTRUCTION

Fancies, Fallacies and Facts About the Science.

WHAT AN EXPERT HAS FOUND

Why New Jersey's Supervisor of Roads Prefers a Lighter Macadam to a Telford Road—How to Build a Good Stone Highway.

From the time of the prophet Isaiah to the present men have had their ideas of a perfect highway. The plans of road engineers have been criticised as newfangled, while they were only aiming at the road that Isaiah saw with prophetic eye when he cried: "Make straight in the desert a highway for our God. Every valley shall be exalted, and every mountain and hill shall be made low, and the crooked shall be made straight and the rough places plain." Thus the fancy that a straight road with easy grades is a new idea is swept away by the words of Isaiah uttered over 700 years before the Christian era, writes R. A. Meeker, state supervisor of roads, New Jersey, in the Good Roads Magazine.

Later Claudius Appian had his vision of a road that would perpetuate his name, and his dream has been realized. But beyond that he gave—what? The monument of a tyrant who compelled thousands to work for naught and a lasting example of how not to build a road. The Appian Way, famous in picture and story, is avoided over a greater portion of its length by every traveler who is in a hurry to reach his journey's end.

This old Roman's idea of a deep foundation has lived after him, but no experienced road builder adopts it. The old Roman's fancy that it is necessary to build a deep foundation for a road crops out here and there, even at the present time, and is exploited as the best and, in fact, the only true way to build a road. It was not until road builders learned that thoroughly drained earth was the only sure foundation for any kind of road covering that a great advance was made in road construction.

That road improvement is an expensive luxury, something nice to have, but too costly for those who have to work for a living, is the fancy of some, but it is not borne out by experience. In New Jersey every dollar expended for road improvement has added tens and hundreds of dollars to our state's wealth.

The first roads I built were sixteen inches deep, composed of ten inches of telford bottom and six inches of compacted two and one-half inch and one and one-half inch crushed stone and finished with coarse stone screenings. That the foundation of this kind of road lasts is true, but the top wears off much more quickly, and when that is gone every driver avoids the telford road in good weather. I well remember the first sixteen inch telford I ever saw. It was in 1860 at my home city of Plainfield, N. J. We boys were discussing it very learnedly, as we thought. In fact, we were merely rehearsing what we had heard our elders say, when an old Scotchman passed by and, catching the drift of our remarks, said: "Boys, it is wrong. It is a' wrong. It is wrong in principle. Here ye hae the anveel, an' on it ye put the sma' stone. Along comes the horse and wagon. The horse's hoofs pound the sma' stone an' the wagon wheels grind it till, 'twixt the hammer and the anveel, the sma' stones are ground to powder." We laughed at the old Scot, but my experience has since taught me that he was right. Not only is a deep telford more expensive to build, but the road wears rough much sooner than a lighter macadam and is consequently much more expensive to maintain. It is also much harder on horses' feet, as it has no elasticity.

It has been argued that a deep telford road will not be heaved by frost. This is not so. I have seen fourteen inch telford turned upside down by frost so that the large bottom stones were on top of the road, while six inch macadam built over the same soil and same conditions of travel remained unmoved, the only other difference in construction being that underdrains were placed outside of the macadam, while none was used beside the telford.

To build a good stone road, first grade your hill down to 5 per cent or less if possible; fill up your flats so you have a minimum grade of at least one-half per cent; second, by underdrains cut off all water that may threaten the road; third, give your road a crown of three-quarters inch per foot; fourth, cut out your subgrade, being careful to give it the same curvature as the finished road; fifth, roll the subgrade until it is hard and smooth, carefully removing any spongy or vegetable earth that the rolling may disclose; sixth, spread your bottom course evenly, then roll and add a little blinder and continue the rolling until the stones cease to sink or creep in front of the roller; seventh, spread your second course and roll it, with the addition of blinder and water, until the whole surface is hard and smooth, carefully filling with stone any depressions that may appear, then finish the whole with a course of three-fourths inch stone and screenings. This must be soaked with water and rolled until a wave of mud is formed in front of the roller, being particularly careful to commence the rolling at the sides and gradually work toward the center. By

so doing you will preserve the crown of your road. If this work is well and thoroughly done, you will have a road that is smooth, hard and convenient for travel at all seasons of the year.

WOMEN IN CIVIC LIFE.

Problems For Which the Serious Mind-ed Are Needed to Solve.

There is nothing that women cannot do, but the work must be planned with a thoroughness that precludes failure and done with a modesty which is the inherent charm of the superior sex, says the Woman's Home Companion.

As I said, every community has its own problem. Most of these originate outside of the home. Pure water, pure food, pure air, clean streets, sanitary schools and tenements, district nursing, the education of the ignorant in the care of babies, the question of paupers, the public baths and traveling libraries, the treatment of our women prisoners in prison and after, the lodging house problem—these are only a few of the civic puzzles crying for trained women to solve.

A woman does probably her greatest share of her duty as a citizen when she makes a home a safe and happy harbor of refuge from a stormy world, when she brings up her children into noble manhood and womanhood and when she does not destroy her husband and family by bad cooking and bad temper, but that same woman crowns her career as a citizen when she interests herself in and becomes a vital part of some problem of government. A woman successful in home life is desperately needed in civic life.

DELAWARE EXPERIMENT.

Roadmaking in Which River Sand, Kaolin and Clay Were Used.

In his report of road improvement done in Delaware, State Highway Commissioner Francis A. Price describes a bit of experimental road-making in which river sand, kaolin and clay were used for surfacing, says the Good Roads Magazine. At the expense of the local taxpayers the foundation was graded by a scraper, to a slope one one inch to the foot, from the center line to the side ditches, then rolled with a steam roller.

On this foundation four inches of sand were spread, then four inches of clay, which was covered by three inches of sand. These layers were thoroughly mixed by harrowing, then rolled down smooth and hard.

On 100 feet of this road what is described as kaolin sand was spread, and on 300 feet sand from a stream near by was used. For labor and teams the county paid \$172.25 and for sand \$5.15. The entire cost of this bit of experimental road was at the rate of \$2,400 per mile. As a summer and a winter have passed since this road was so treated a fair idea of this treatment should soon be obtainable.

Road Legislation in Arkansas.

The joint resolution No. 4, introduced in the general assembly of the state of Arkansas by Representative Hunt, was duly passed and was signed by the governor May 23, 1907. This resolution is considered the most important of the good roads measures passed by the assembly, says the Good Roads Magazine. It provides for a change in the constitution so as to allow cities of the first and second class to issue bonds for road building and for purposes of general improvement and counties for purposes of improving their highways. This measure, in order to make it effective, must be carried in the election two years hence.

Rural Delivery Notes

At the corner of Shelby and Craft streets in Indianapolis, where the city's southern border runs, there is a big silver poplar tree that serves an even better purpose than that of being a good shade producer. It might be called a postoffice substation, for on its trunk there are just ten rural delivery mail boxes, and they serve to keep the neighborhood in touch with the outside world, says the Indianapolis News. The mail boxes are not of the fancy sort at all, but they serve the purpose.

Claiming the distinction of being the first man in the United States who ever carried a rural mail route, E. P. Wright, who resides on the Jackson place in Franklin township, Ohio, is still employed in the mail service, carrying R. F. D. No. 3 from the South Columbus branch station, says the Columbus Dispatch. Hale and hearty at the age of threescore and ten, Mr. Wright makes his daily trips and has to his credit fifty-five years in Uncle Sam's service.

There are ten women carriers in the rural service in Missouri. Kansas has twelve, Oklahoma six, Texas six, and Arkansas three.

STATE'S ROAD WORK.

Connecticut Will Build Trunk Roads on a Uniform Plan.

Even a year ago the proposition to bond the state of Connecticut for \$5,000,000 or \$3,000,000 in order to build good roads would have been regarded as visionary. While the automobilists would have been glad of the roads which would result from such a course, it is doubtful if even they would have looked upon such a plan as other than a little too ambitious to go through, and the farmers wouldn't

have considered it for a moment. Now the situation has so changed that the farmers are actually asking the committee to report a good sized bond issue to be available for improved roadways at about a million a year, writes a New Haven correspondent of the Boston Transcript.

Connecticut has done much toward acquiring good roads as a state, and yet it is the fact that the state has no system of good roads today worthy the name, and while there are stretches of road in different sections which have been well built and built to last in a general way the expenditure of money does not show.

The basis of the new plan which seems likely to receive the support of the general assembly consists in the state's taking over absolutely all trunk roads. The state will be entirely responsible for these roads, and with an appropriation of a million a year it won't be long before Connecticut will have a state wide network of first class roads. Certain concessions in the matter of choosing the road to be improved will be made to the local authorities, but it must be a trunk road.

The state will go into the roadmaking business on a large scale, will have its own trap rock quarries or take the entire output of private quarries, will have its own stone crushers and all the other necessities for successful roadmaking, will employ its own foremen and inspectors and will go at the whole business on a uniform plan. Not the least of the benefits of the scheme will be the fact that the towns will have their own road appropriations intact to spend on roads leading to the trunk lines improved by the state. It is proposed to bring the highway commissioner into even closer touch with the automobilists by giving him an auto in which to travel from town to town overseeing the road building. And, incidentally, all the taxes on autos coming to the state will be spent on good roads, in addition to the proceeds from the bond issue.

Planting and Care of Street Trees.

All planting of trees on streets should be done by the town or by permanent organizations authorized to carry on the work, says the Los Angeles Times. The poorer the soil the larger should be the hole for the tree. If convenient, add rich soil. Spread the roots carefully. Fill in with pulverized soil and press into contact with the roots. Protect the tree with a line of wire netting supported on three or four posts. It adds to the expense, but pays in the long run. But in the protection of the young trees don't forget to stir up civic pride. Interest the whole town in the improvement club's scheme. It is right here that special celebrations have their place. Provide for the small boy and enlist him if you can. It pays better than to permit arrest or threaten with arrest. Don't permit telegraph or telephone linemen to mutilate trees or climb them with spikes. Secure the passage of ordinances forcing wires and cables underground wherever practicable. Telegraph and telephone masts are unsightly and interfere with all schemes of street improvement and tree planting.

St. Mary's Academy. Beautifully located in Portland, Oregon. Offers unsurpassed facilities for the culture and education of young women. Special opportunities in Music, Art, Languages and Literature. Well equipped Physical and Chemical Laboratories. Herbarium and Mineral Cabinet. Largest and oldest Ladies' Seminary in the Pacific Northwest. It enjoys a national reputation for imparting the best physical, mental and moral training and developing true womanhood. Equips socially and educationally for the most exalted station. Confers Academic and Collegiate Degrees by State Authority. Interference with convictions of non-Catholics is scrupulously avoided. Academy is ideally located, and inspiring scenic advantages. Social opportunities such as are available in no other city on the Coast. Buildings large and commodious, well-lighted, heated and ventilated; dormitories and private rooms supplied with all modern conveniences. The institution is liberal and progressive without sacrificing the character and traditions of age and achievement. Terms modest. Satisfactory references required. Write for announcement booklet. Board and tuition \$150 per year. Address Sister Superior, St. Mary's Academy, PORTLAND, OREGON, U.S.A.

Hazelwood N. Wood PURE RICH ICE CREAM. It is used in the manufacture of Hazelwood ICE CREAM, abundance of cream being secured for this purpose by the large volume supplied for the manufacture of Hazelwood Butter: No albumen, gelatine or other animal or chemical compound of any character is in Hazelwood Ice Cream, in richness and smoothness being due to the actual richness of the cream of which it is manufactured. Only pure fruit, vegetable or nut flavors are used in coloring or flavoring.

A Bold Step.

To overcome the well-grounded and reasonable objections of the more intelligent to the use of secret, medicinal compounds, Dr. R. V. Pierce, of Buffalo, N. Y., some time ago, decided to make a bold departure from the usual course pursued by the makers of put-up medicines for domestic use, and so has published broadcast and openly to the whole world, a full and complete list of all the ingredients entering into the composition of his widely celebrated medicines. Thus he has taken his numerous patrons and patients into his full confidence. Thus too he has removed his medicines from among secret nostrums of doubtful merit, and made them remedies of known composition.

By this bold step Dr. Pierce has shown that his formulas are of such excellence that he is not afraid to subject them to the light of public opinion.

Not only does the wrapper of every bottle of Dr. Pierce's Golden Medical Discovery, the famous medicine for weak stomach, torpid liver or biliousness and catarrhal discharges wherever located, have printed upon it in plain English, a full and complete list of all the ingredients composing it, but a small book has been composed from numerous standard medical works, of all the different schools of practice, containing very numerous extracts, written by the leading practitioners of medicine, endorsing the strongest possible terms, each and every ingredient contained in Dr. Pierce's medicines. One of these little books will be mailed free to any one sending address on postal card or by letter, to Dr. R. V. Pierce, Buffalo, N. Y., and requesting the same. From this little book it will be learned that Dr. Pierce's medicines contain no alcohol, narcotics, mineral acids or other poisonous or injurious agents and that they are made from native, medicinal roots of great value; also that some of the most valuable ingredients contained in Dr. Pierce's Favorite Prescription for weak, nervous, overworked, "run-down," nervous and debilitated women, were employed long years ago, by the Indians for similar ailments and their ailments. In fact, one of the most valuable medicinal plants entering into the composition of Dr. Pierce's Favorite Prescription was known to the Indians as a remedy for their ailments, and that it was made from native, medicinal plants was gained from the Indians. As made up by improved and exact processes, the "Favorite Prescription" is an efficient remedy for regulating all the womanly functions, correcting displacements, as well as for the relief of nervousness, and overcoming painful periods, relieving the nerves and bringing about a perfect state of health. Sold by all dealers in medicines.

GIVE NATURE A CHANCE.

The strongest minds have gotten their inspiration direct from Nature. Nature is the great teacher of mankind. We can look to Nature for all our needs. In the recent Russo-Japanese war the surgeons of the Japanese navy and army discovered that wounds which healed rapidly and with better success if left to Nature. They washed the wounds with water which had been boiled and thus sterilized—then bandaged the wounds with clean linen—no powerful drugs or disinfectants were used in their first aid to the injured. Such methods resulted in the loss of only 33 out of 682 men treated in a naval hospital for their wounds. It is only from lack of observing Nature's laws that most of us suffer at one time or another from indigestion, impure blood, generally a nervous system. Our remedy lies in Nature's laboratory—deep in the fragrant woods—where are many American plants, the roots of which when properly treated will supply a health-giving tonic.

Many years ago a physician who had made a study of the plants which he had made a striking departure from the usual methods of his confreres in medicine—he went straight to Nature for the cure of those stomach disorders which resulted so often in an anemic condition, or impure blood, loss of appetite, pain or misery, a generally feeble and nervous weakness. He found that the bark of the Black Cherry-tree, the root of the Mandrake, Stone root, Queen's root, Bloodroot and Golden Seal root, made into a scientific, non-alcoholic extract by the process of the "Golden Seal" method, made a striking departure from the usual methods of his confreres in medicine—he went straight to Nature for the cure of those stomach disorders which resulted so often in an anemic condition, or impure blood, loss of appetite, pain or misery, a generally feeble and nervous weakness. 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