

HIGHWAY PROGRESS.

Five Years' Work in New Jersey. Through state aid there have been built in New Jersey about 450 miles of hard roads. Counties, boroughs, townships and other municipalities have constructed as many more. Each year since 1905, when the state began to aid in this matter, the miles of road improved have increased, and the outlook, according to the recent annual report of Henry I. Budd, the commissioner of public roads, is for a steadily widening interest. In 1905 the construction was 40 miles, in 1906 50 miles, in 1907 70, in 1908 85 and in 1909 about 110, while the total additional mileage petitioned for is 500. For the year ended in October last the cost per mile was somewhat larger than in the previous year because of the higher price of labor and stone and delays in transportation due to the shortage in cars.

The increase in the state appropriation from \$100,000 to \$150,000 enabled



some of the more enterprising of the counties to build as many miles as the limit of one-fourth of 1 per cent tax on their ratables would allow, and this in many cases has brought construction to the point where continuous hard roads over comparatively long distances are available. There is a continuous line from Newark to Lake Hopatcong, several from Morris county to the Oranges and one between Camden and Trenton, while approved applications provide for continuous lines from Newark to Newark and Trenton to Long Branch and an improved highway all the way from New Brunswick to Trenton and thence to Jersey City.

Among the recommendations made by the commissioner, an important one is for legislation to regulate the width of trees. It passes his comprehension that the state, after expending at least \$4,000,000 in improved roads, should not guard them against destruction by indifferent owners of freight vehicles.

STATE AID IN NEW YORK.

Lack of appropriations nullifies the good construction of roads by New York state is probably known to few.

"The trifling attention paid to the good construction of roads by New York state is probably known to few. Massachusetts, Connecticut and New Jersey are far ahead of us, and it is a fact that the lack of good roads is driving people into other states, where they will have better advantages for driving, wheeling or automobiling, if that latter word is allowable," said A. H. Shattuck of the good roads committee of the automobile club.

"Two years ago the Highways-Armstrong bill went into effect, and the legislature has made two appropriations of \$50,000 each. Of this amount, up to October last, \$38,000 had been spent, and 7 1/2 miles of road were finished, while 17 miles are now in process of construction.

"It has been estimated that nearly \$3,000,000 a year is spent in the repair of New York roads, but the same method is to plow up a ditch on each side of the road and throw the grass and roots into the middle of the highway. It is easy enough to see that this does not insure a permanent good road. Under the Highways-Armstrong law one-half of the cost is paid by the counties in which the improved roads are constructed. The state engineer reports that he has received 121 petitions for the improvement of highways, aggregating about 670 miles of road.

"In other words, the citizens themselves are anxious to pay one half of the cost for 670 miles of road just as soon as the state approves the other half. Against this seven miles of good road completed, partially at the state's expense, we have in Massachusetts 270 1/2 miles completed under similar laws, 200 miles in Connecticut and 430 1/2 miles in New Jersey. Massachusetts appropriates \$500,000 a year for good roads, while the best that New York has done thus far is \$50,000 a year."

A Question of Economy.

There is no question of domestic economy of wider practical interest to an agricultural, a commercial or a manufacturing people than that of good roads and how to preserve them. It enters, directly or indirectly, into the value of every commodity taken to market, either through the cost of transportation or its influence upon the time chosen for that purpose, and so affects the interests of the producer in one way and that of the dealer or consumer on the other.

Road Notes.

With muddy roads and wagons should be included in the farmer's sinking fund.

Turnpike toll roads before the invention of railroads were common in this country and even now in some districts are still to be found.

Muddy roads are an invitation for you to stay away from a community.

And are you speaking a good word for wide tires wherever it will do good?

WORK FOR GOOD ROADS.

The agitation to be continued with increased ardor.

Now that the League of American Wheelmen has abolished its racing department every attention will be given the other branches of work. The most important of these is the highway improvement department, to which is entrusted the work in behalf of the good roads movement.

The league has made rapid strides in this movement, particularly during the past year, but the racing question has reflected upon this as upon all other departments, the matter being disseminated that none of the branches of league work could be made effective until the racing question was settled.

The most important work accomplished last year was the holding of many good roads conventions in various states, the introduction of highway improvement measures in many of the state legislatures and the evolution of the movement to national proportions, as was evidenced by the bill introduced in congress calling for an appropriation of \$5,000,000.

Constitutional amendments were carried in Michigan and Minnesota, and a large amount of education on the subject was circulated by the league. All

ROAD DISRUPTERS.

FORCES WHICH OPERATE TO DESTROY HIGHWAYS.

Frost Action a Potent Factor in the Disintegration of the Foundation. Wear and Tear of Water-The Limit of Grade.

It has been the object of the highway engineer ever since the days of Macadam to construct a road in such a manner that frost action above subgrade may be reduced to a minimum, says C. W. Macadam, a restatement, and strenuously for a dry foundation. The evils resulting from the disrupting effects of water alternately freezing and thawing in the foundation of a road are too apparent and too well known to warrant a restatement. There is no principle of greater importance than this, and today engineers differ only as to the best means necessary to attain such an end. Frost action is not only a potent factor in disrupting a macadam, but its presence in stones is promotive of weakness and more rapid crumbling. The presence of frost in fragments of broken stone operates to increase their brittleness to a considerable degree, and for this reason a road built with a macadam disintegration of the screenings and the upper portion of the road. So pernicious is this agent in causing brittleness that quarries, where blasting is necessary, so time their work as to avoid blasting operations during the winter.

The ability of water as a medium of transportation of material by a mechanical process depends upon the specific gravity, the size and the form of the material, and upon the velocity of the water, or what amounts to the same thing, the slope of the roadbed. The ratio of rise to horizontal distance is largely a matter of custom, but a 5 per cent grade is now considered about the limit of steepness. It is not always possible to obtain without great expense a grade of five feet in 100 in some parts of our country, but the necessities of steeper grades are not frequent in the eastern half of the United States, although the old custom of New England of building over rather than around the hills often makes the roads of this region excessively steep.

The gullying of roadbeds during heavy rains or melting snow is the most conspicuous work done by flowing water on our highways, yet we should not pass by the sorting process it exercises even on gentle slopes, where the grains of the least weight and specific gravity and of the most tabular form are made to occupy the surface of the road, thus, after drying, falling an easy prey to the power of the wind. This sorting action arises from the fact that, other things being equal, the smaller particles will themselves in water in the order of their specific gravities, the heaviest at the bottom. An exception to this rule is found when minerals even of a high specific gravity are characteristically flat and tabular, as is the case with mica, which will arrange themselves in layers, offering to desert, owing to their relatively large surfaces, causes them to arrange themselves at the top with minerals of the lowest density.

The slow working water during ordinary rainstorms, such as it flows toward the gutters carries in its grasp the fine grains of quartz and feldspar resulting from the wear and tear of a roadway of granite macadam. The mica usually present in granites is very easily transported both by wind and water action, owing to its tabular character, and this mineral under all circumstances is undesirable in road metals. When the necessities of the case force the use of granite rocks, it is well to select those, such as syenites or granites, containing as small a percentage of mica and quartz as possible. When accessible, the chemical analysis of the rock will usually be a safe guide in this latter particular, those having the lowest amount of silica being the freest as a rule from quartz. In case a granite is in an extreme state of decomposition it should never be used for the superstructure of a road, as the resulting amount of clay present and resulting from further decay gives rise to sticky roads in wet weather and dusty ways in dry periods.

Teaching Road Construction. One feature of the good improvement work in Michigan, as referred to by Chief Consul Earle of the L. A. W., is as follows: I have tried to get the colleges and preparatory schools to do something toward teaching the needs of good roads, the cost of bad roads, how to build roads and how to maintain them after they are built. So far I have met with no perceptible effect except at the Michigan Agricultural college at Lansing, and I give me great pleasure to be able to report that Professor I. H. Taft has taken up the matter in such a way as to merit our highest esteem. He is building several samples of good roads on the agricultural grounds, and I predict that when he gets these fairly planned you will soon see samples built in other parts of the state.

Steel Track Wagon Roads.

Tests in steel track wagon roads to make traffic easy in sections where modern highway improvements are yet impracticable which have been made by the director of the office of road inquiry of the department of agriculture at the Omaha exposition. St. Anthony's park, Minneapolis and in the suburbs of Cleveland have proved that the idea is perfectly feasible.

The advantages claimed for the steel track wagon road are cheapness of construction, ability to diminish the weight of the wagon, ability to haul heavy loads with less horsepower, increase in speed and the ability to substitute inanimate power for horses. -Omaha World-Herald.

Trimmed Sheep.

Some complain much about the inability of trimming sheep on the ground that it is an attempt to deceive, says Professor Thomas Shaw in The North Western Farmer. There is only one way of looking at it. The aim of the average man who trims sheep is not so much to deceive as to improve the appearance of his wools. To that end a horse is groomed. It is to improve her appearance that a maiden decorates her hair. It improves the appearance of a sheep to have him trimmed, even though he is free from defects. But, even though the aim should be to cover up defects, there is one class of men from whom the defects cannot be hidden—that is to say, men who understand the chief essentials of good mutton farms. When these men get their hands on a sheep the attempt to hide its weakness will not avail. In this we have another illustration of the fact that knowledge is power. The men who are to excel in live stock in the future must understand it, else they

cannot hold their own in the fierce competition of today. To this we have a powerful argument for teaching agriculture in our colleges and in giving every attention to the short course in these colleges. Young men of the farm, look into the short course at our agricultural colleges. It can do you much good. You ought to take it when it is not possible for you to take the longer and fuller course.

COUNTRY HIGHWAYS.

GREAT REVIVAL OF ROAD IMPROVEMENT IN AMERICA.

The Spirit of Progress and Development Which Built the Railroads Now Turns to Common Roads—Solving Transportation Problems.

The spirit of road building and improvement has not been inactive in this country during the past century, but, owing to physical difficulties and, in some instances, to the lack of a different course from that of other nations. Road building we have had now for nearly 100 years, and in all this time a spirit of enterprise and activity has marked the work and brought renown and credit upon the builders. The nature of the country demanded that a different system of road building from that prevailing in England and France should be adopted, and the results of the closing century's labors are greater by half than those obtained in any other country on the globe. Not even taking all into account, the difference in age, the United States stands today as the leading road building country of the world. What the European countries have accomplished in 500 years we have brought to pass in less than 100. We have the longest and best roads in the world. It is no discredit to us as a nation when it is said in reply that they are only in the form of railroads and not ordinary country roads. For that that of every kind of road built together by rapid means of communication. Early in the present century the question of building roads of the ordinary kind was agitated, and the party which believed in a liberal construction of the constitution favored a suspensive plan of getting the government to construct great national highways. That spirit of road improvement, started early in the present century, has waxed stronger and stronger up to the present time. The need of opening the country by means of long roads was appreciated by every one. Early in 1800 the great national highway was begun. It was interrupted and then abandoned for good cause. But after an interval of more than 20 years similar enterprises have been undertaken in different parts of the country. The old system of road building was simply suspended because all the private energy and capital were needed to build railroads. The railroads when introduced were found to be great improvements over the old highways so far as opening up the country was concerned, and private capital was invested by the millions. The net result of this work are visible today in the 180,000 miles of railroads and about 50,000 miles of sidings and double tracks. This is the reason why American common roads have not advanced as rapidly during the present century as other physical improvements of the country.

The opening of the country by vast railroad systems, however, has about reached a climax, and ten years ago the work of constructing new lines practically ceased, except in a few unsettled parts of the country. But with the decline in railroad building the old spirit of internal road improvement is revived, and the work, discontinued 94 years ago, may now be said to be going on again with renewed vigor. In every part of the country new and improved common roads are being constructed, railroad lines are being connected with the surrounding farms and villages by fine macadamized roads, and bicycle paths and pleasure boulevards are springing up as by magic. The brains, capital and energy of the country that early in the present century constructed the immense lines of railroads are now being turned into road investments of a different nature. The transportation problem will not be solved until every habitable part of the country is in direct communication with every other part, and this can be accomplished only by building common roads that are passable at all seasons of the year. The bicycle has been credited with causing a great deal of the modern road improvement spirit, but another potent cause is that railroad building had almost reached its limit when the macadam highway became popular, and the new era of the transportation question was beginning. The coming of the bicycle changed and hastened upon the trend of public opinion and focused attention upon the public roads.

The future of our roads is assured. It will not be a great many years before the United States will have some of the finest and longest macadamized roads in the world. The national government and the legislatures of nearly every state, pushed on by the ever increasing army of road enthusiasts, are making provisions for extending and improving the road systems of the country. It is estimated that we have already something over 1,200,000 miles of common roads in the country, a total mileage greater than that of any other single country, but the majority of these roads are in poor condition and have sprung into existence without method or system.

Ten years ago the extremely bad condition of the roads attracted public attention, and since then improvements upon them have been going on steadily. State commissions of expert road builders and scientific engineers have been appointed to examine into their condition, and their suggestions have brought about a change that promises to transform the face of the country.—New York Independent.

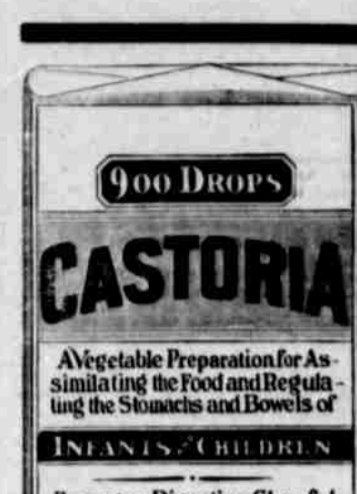
Henry L. Budd, road commissioner of New Jersey, in a recent address before the Automobile club, said: "By state aid New Jersey has created and is creating several continuous lines north and south, east and west, throughout the state, and it is now possible for farmers to easily carry their heavy produce to the great markets and bicycles, automobiles and other vehicles to have free coursing ground over hundreds of miles of hard avenues. To still further emphasize the desire of the farmers for these improved roads, I will state further that the petitions from the farmers in many of our counties are so numerous that the freeholders cannot decide which they will first build, so they pass them on to the commission to be decided. The result is that upon all our open days at Trenton the office is filled with farmers petitioning me to select or approve of their road first. At my home

In Mount Holly delegations of farmers are daily waiting upon me, pleading that their roads shall first receive recognition. Some days I have been so thoroughly beset by the street by different delegations of farmers that it has taken me four hours to get from my house to the postoffice, a distance of about 600 feet."

It is important to explain that these farmers pay 10 per cent of the cost of those roads which immediately benefit them. The state pays one-third of the expense and the county the remainder.

The annual report of the commissioner of public roads for New Jersey shows that in 1899 116 miles were completed, an increase of 31 miles over 1898. There has been no cessation in the desire for good roads, says Commissioner Budd, and he adds: "If the same idea continues to materialize for a few years, automobiles will be able to travel on smooth surfaces over all the desirable portions of this state."

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DINING CARS US ORDER ROUTE: FULLMAN BUFFET SLEEPERS Second-Class Sleeping Cars ATTACHED TO ALL THROUGH TRAINS. West Side Division. BETWEEN PORTLAND AND OREGON: Mail Train Daily (Except Sunday). 7:30 A.M. Lv. Portland Ar. 5:00 P.M. 7:44 A.M. Lv. Hillsboro Lv. 7:13 P.M. 11:55 A.M. Ar. Corvallis Lv. 11:30 P.M.

At Albany and Corvallis connect with trains of the Oregon Central & Eastern Ry. Express Train Daily (Except Sunday): 1:50 P.M. Lv. Portland Ar. 8:25 A.M. 6:10 A.M. Lv. Hillsboro Lv. 7:13 P.M. 7:30 P.M. Ar. McMinnville Lv. 5:50 A.M. 8:30 P.M. Independence Lv. 4:50 A.M.

Through Tickets: To all points in the Eastern states, Canada and Europe can be obtained at lowest rates from C. E. B. each agent or John H. Gault at the Markham Office, Hillsboro. C. H. MARKHAM, G. KOEHLER, Gen'l. P. A. & Ticket Agent, Vancouver, Portland.

MONDAYS TUESDAYS WEDNESDAYS THURSDAYS

TO KANSAS CITY CHICAGO BUFFALO BOSTON WITHOUT CHANGE VIA SALT LAKE MO. PACIFIC AND CHICAGO AND ALTON RY.

TO OMAHA, CHICAGO, ST. LOUIS, WITHOUT CHANGE VIA SALT LAKE, CHICAGO, ROCK ISLAND & PACIFIC RY.

TO ST. JOSEPH, KANSAS CITY, ST. LOUIS, WITHOUT CHANGE VIA BURLINGTON ROUTE.