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The gospel of
good roads.

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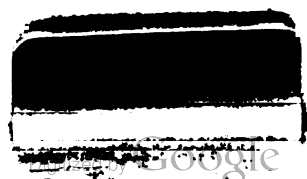
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Prof. Moore

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From Professor Chas. E. Greene,
Nov. 7, '99

“How cam'st thou in this pickle?”—*Shakespeare.*



THE GOSPEL
OF
GOOD ROADS.

A Letter to the American Farmer.

BY

Isaac B. Potter

Published by THE LEAGUE OF AMERICAN WHEELMEN, under direction of its National
Committee on Improvement of the Highways.

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ACKNOWLEDGMENT.

THE National Committee on Improvement of the Highways takes this opportunity to make public acknowledgment of the cordial assistance which its work has received from many sources. The thanks of all wheelmen are due to President Dunn and the Executive Committee for the uniform support and encouragement which our efforts have received at their hands; to the New York and Connecticut State Divisions for their contributions of photographs; to Mr. Marriott C. Morris and Mr. John Carbutt for their individual labors and contributions of valuable pictures of American and foreign roads; to Mr. Arthur G. Collins, whose letters and photographs, sent from France, have abundantly added to the force of our work; to Major Charles L. Burdett and to Chief-Consul Mott, of Maryland, for the results of their labors as members of this committee during the last year, and to Chief-Consuls Bull, of New York, and Brown, of New Jersey, for the invaluable personal and official aid rendered by them in many ways.

We are conscious also of many obligations due to other friends and members of the League for kindred favors, but space will not here permit a more extended acknowledgment. They are not forgotten, and we thank them all.

ISAAC B. POTTER,
W. M. P. BOWEN, } *Committee.*
CHAS. W. WOOD, }

I have heard of a very clever woman whose otherwise excellent husband disturbed the felicity of the household about twice in each year by making himself very drunk. The good wife, despairing of the common and commonly hopeless remedy of moral suasion, applied her wits to the discovery of a newer and more effective means of appealing from Philip drunk to Philip sober. On the occasion of his next debauch, when he was brought home in a condition of maudlin helplessness, with clothing smeared and torn, eyes bleared and face inflamed by drink, she sent for the photographer and caused a life-size picture of her limp lord to be taken, which was duly finished in appropriate colors, framed and hung in a place of honor in the family reception room, where she insisted upon keeping it for a period of three months, and made known her vow to double the term whenever the offense should be repeated. That picture was a silent and successful preacher.

It has seemed to me that if national errors could be reflected in the same forcible way; if some power could and would

"the giftie gie us,
to see ourselves as others see us"

we should get to the end of many of our difficulties. The dirt roads of America are heavy drinkers. They lead a staggering and uncertain course from town to town; smear themselves with thick mire; for four months in the year are unfit for the company of respectable people, and less than eighteen months ago got themselves regularly indicted by the grand jury.* The pictures of roads shown in this pamphlet are made from photographs. Like all truthful pictures they are better than words, and if they shall supply force to the imperfect work which I have put together in the odd moments picked from the hours of an exacting profession, I shall feel that I am doubly paid for my trouble, that the pictures themselves are a sufficient reason for their existence, and shall owe an abundant gratitude to the friends by whose aid they have been obtained.

*On January 14, 1889, the grand jury of Union County, N. J., came into court with a formal presentment against the old roads; declaring that "public interests demand that these roads be repaired and put in good condition at once."

THE GOSPEL OF GOOD ROADS.



A COUNTRY ROAD IN FRANCE.

I.

To the American Farmer :

In these days, when the voice of your complaint is loud in the land, and a thousand partisans are declaiming a thousand theories to account for the "decline of agriculture," I will try to write you a letter, in which, I believe, I can make it appear that the greatest remedy for the cure of unprofitable farming lies in your own hands.

It is a thankless, unpopular, and, in some respects, a discouraging thing to preach reform, and the man who undertakes it for your benefit is entitled to your everlasting regard. I am going to make that claim upon you, and you will be more ready to square the account when you know that I am opposed to high taxes, and to the placing of undue burdens upon the farmer, and that I am only trying to show

a way for the enrichment of your slender purse and the betterment of your condition.

The man who lives on a farm should be happier for every association of farm life. It is a splendid thing to breath pure air, drink pure water and have a hundred acres of elbow-room. Another thing, every farming community is a community of homes. You have something to be proud of in that. It broadens your manhood and makes you know you have a sacred spot to love and defend. It makes you a good citizen, and a tender husband and father. I wouldn't give much for the patriotism of a man whose only interest in the nation can be packed in a carpet bag. He is not the man for the times when his country is in peril, and when the air trembles with the noise of battle you will find the great bulwark of defense to be made up of volunteers from the farms and firesides. Most great men have been born in the country, and no child of genius ever yet thrived in a boarding-house. The great and successful government is always a government of homes.

And I want to acknowledge the importance and grandeur of your vocation. It is the prime source of all national wealth, and, under proper conditions, it should make you the happiest and most independent of mortals. By the fruits of your toil humanity is sustained, and to reward your industry the coffers of the world are open.

But these are the incidents of your calling. Personally you inherit the common foibles of the race, and you are not aloof from the errors nor exempt from the misfortunes which beset us all. In all kindness let me remind you that in other years you and your good neighbors have opposed many great improvements which were intended for our common benefit, and which the lapse of time has placed in the highest niches of human advancement. You do not forget that when the first railroads were projected you appeared before the legislature of your State and opposed the granting of franchises to all such iniquitous schemes. You said that the locomotives would burn your crops and set fire to the wool on the backs of your sheep; that the gases from the smoke stack would poison your family and your farm stock, and that travel in a railroad car at the frightful speed of twenty miles an hour would be fatal to many passengers and dangerous to all. You opposed the telegraph and ridiculed the mowing machine. You took the sewing machine on sufferance and regarded the patent thresher with a suspicious eye; and I might almost say there is no great invention of commercial or agricultural value which was cheered at its birth by the warmth of your approval.

It is best that I should remind you of these things. I do it with-

out malice, for I am somewhat of a farmer myself, and in this most friendly communication it is best that we begin with the frank understanding on all sides that in spite of your great intelligence, events have proven that, like the rest of mankind, you are likely to err. We don't always recognize a good thing at first sight.

You have changed your opinions about many things because you did not at first understand their value. Observation, argument and experience have helped you out of many an error ; and I am sure you will pardon me if I suggest that you have never yet learned the value of a good road ; for upon this subject you have had neither observation nor experience, and without these argument is certain to go astray. Let me remind you by one or two illustrations taken from your personal history.

The scythe and the flail are no longer the best tools of your trade, and you long since ceased to shoot crows with the old flint-lock. A few years ago one of your venturesome neighbors went to the State fair and brought home a patent reaper. A little later an enterprising drummer sold him a thresher and a fanning mill. He was a brainy neighbor, with plenty of nerve and a confidence in his own judgment, and you profited by his experience. You looked over the fence while he was at work and became satisfied that the old way of doing things involved an extravagant waste of time and labor ; and you soon found that the money spent for farming machinery was well invested. Then they ran a line of railroad up through your county, and after a while you discovered that it was cheaper and vastly quicker to ride on the cars than to go long journeys by the common road ; and you have been on tolerably good terms with that railroad ever since.

Each of these splendid improvements has filled a want. Proving first its usefulness and then its necessity, it has found a market. You cannot half succeed without it. Did you ever think how it was that all these labor-saving things were first brought to your attention? They were not born in a public institution nor invented by a public officer—not one of them ; they were not put in use by the vote of a town meeting nor by proclamation of the Governor ; they are no part of the public business, and in bestowing their benefits they have been careful to avoid the sluggish turn of the public mill. It all came about in quite a different way. Do you remember how you first came to buy a mower? A wide-awake Yankee told you that he had a machine for cutting grass by horse-power ; that this machine would do better and cleaner work than your scythe, and that, too, at the rate of an acre an hour. You said "Nonsense." He took his mower down into

your meadow, and in a good-natured way proved to you that you could save money in buying that machine ; that you had been paying too much for hired help and boarding too many extra hands in harvest time. You bought that mower, and though you paid what seemed a round figure, you now know that it has paid for itself many times over.

And so you see at the outset, that the mower was rather forced upon you, as were the horse-rake and the reaper and all the rest of the splendid things in the category of farming machinery. You have taxed yourself to pay for these improvements. There is no philanthropy in trade, and you have paid cost and profit to the manufacturer till he has grown rich in the business ; but on the other side of the account it appears that the millions of money spent by the farmers of the United States for improved machines have been repaid to them a hundred fold by the saving of time, labor and money which the old methods would have entailed. You have shared benefits and divided profits with the manufacturer, and your money has gone unbewailed to pay for a splendid thing. Your tax has turned out to be an investment, and in the year 1880 you had over four hundred millions of dollars invested in farm implements and machinery.

But I began with the intention of writing to you about roads—the common road that leads from your door-yard to the nearest market. Did it ever occur to you that this road is part of the machinery of agriculture? That your farm wagon is a machine, pure and simple, and that the road bears the same relation to your wagon that the steel rail bears to the railway car? It will do you no harm to think of this a moment, and to remember that every great improvement is the child of thought. The head will ever guide the hand, and every splendid thing you ever did was born and bred in your brain. When the people think the nation moves ; and a government of sluggards is next door to a government of slaves.

If I could be sure that your strong sense would be put to work in the settling of this question of better roads, my letter to you might stop right here ; but I know that your thoughts are every day directed in the channel where flows the tide of your personal affairs, and in these times of fierce competition you have little to give to the settlement of public questions. You have taken things as you have found them, and long use of dirt roads has almost persuaded you that they are good enough. You are a victim of the ensnaring wiles of custom. "Custom," says Montaigne, "is a violent and treacherous school-mistress. She, by little and little, slyly and unperceived, slips in the foot of her authority ; but having, by this gentle and humble

beginning, with the aid of time, fixed and established it, she then unmasks a furious and tyrannic countenance, against which we have no more the courage nor the power so much as to lift our eyes."

I have no axe to grind and have nothing to sell you ; but I want you, as an old friend, to give to this question of good roads the same thought that worked your brain when you bought the mower, for I am going to say some surprising things to you about the country roads, and we shall get on immensely better if we agree about the



facts. And I am going to try to steer clear of theory ; for the road question is far and away the most important one to the American farmer to-day, and when we talk about roads it is best to bear in mind that one fact is worth a gross of guesses, and to apply that scriptural rule, which is no less good in material than in moral things: "Prove all things ; hold fast that which is good."

II.

You will agree with me that your roads are bad. You may not know that they are the very worst in the world ; but you have never



seen or heard of worse ones; nor, alas, perhaps of better. You live on the main road in an important county. I saw you one day last spring trying to drive your best horse through the pasty depths of that mysterious streak of public territory, and while the patient beast was pulling the harness in two, in his efforts to lift you and your scant load on to the little bridge near the mill, your photograph was taken, and I have had it copied on page 9 of this pamphlet.

It is an honest picture—as honest as the sun; let us sit down together and look at it. You will notice that your face is turned the other way, and I promise not to tell anybody who you are; for I feel that the day is soon coming when every American farmer will look upon that picture with some regret, and I have no desire to humiliate a friend; besides, it is not your fault alone that this road is bad, nor is it this road alone that presents a sea of slush and slime throughout each rainy season.

There were 10,000 farm horses in your county on the day when this photograph was taken, and for about four weeks all the county roads had been in just this condition. Teaming was out of the question; to haul a load to town was impossible, and the 10,000 farm horses stood in their stalls “eating their heads off.” At what cost to the farmers? Assume that the cost of keeping each horse is twenty-five cents per day, including labor, food, and all other items, and in half a minute we compute that it costs \$2,500 per day, \$17,500 per week and exactly \$70,000 for the four weeks that these horses have been standing practically idle. A bad road, you see, is an expensive thing.

It is expensive not alone to the farmers of your county, but to the farmers of the entire country. The average rain-fall in the United States is something over 40 inches per year. The dirt road absorbs these 40 odd inches of water, freezes and thaws, dries, pulverizes, changes from paste to powder and back again from powder to paste, and for weeks at a time is practically impassable. Farm traffic is tied up. You have produce to sell, purchases to make, grain to grind, timber to haul, bills to collect and obligations to meet, but all these must wait because your only avenue of travel is taking its annual soak. A dozen times a day you look out of your barn door with the hope of seeing some struggling vagrant of whom you can inquire, “How is the road?”

I do not intend to overdraw the picture, for we have agreed together to stick to facts alone, and so I have traveled many miles and gone to much trouble in order that my letter to you might contain



only the truth, and I find the country roads to be even worse than I had supposed them to be ; worse than you think them to be. They are disgracefully bad almost without exception. One day I said to myself : " Now, there is the great Empire State ; she is out of debt, rich, populous, thriving ; she has 125 people for every square mile of her territory, nearly 200 incorporated cities and villages, and the value of her farm crops last year was about one and one-half times that of all the New England States combined. I will go up to the capital county of this great State and see what sort of roads New York has provided for her farmers." So one day in April a year ago I went to Albany, and there, almost in the shadow of that magnificent \$25,000,000 State house, I found the farmers of Albany County literally struggling in a " slough of despond." Here is a picture from an actual sketch made at that time.



Another perfectly honest picture ; as honest as the sun. How much do you suppose it costs the farmers of Albany County per day to keep the roads in that condition ? The Legislature was then in session, making laws " for the better government of the City of New York," " for the expenditure of money in the repair of State canals," " for improvement of navigation in the Hudson River," " for the completion of the State Capital," " for the maintenance of convicts in the State Prison," and so on, millions for expenses without end, but nothing in behalf of the farmer. I bought an Albany morning newspaper, and found in that a somewhat extended article on the condition of the roads in the State of New York. Let me quote : *

* See Albany *Argus* of April 16, 1890.

**FARMERS BLOCKED OUT—BAD ROADS—KEEP
RURAL BUSINESS AT A STANDSTILL—
GRAIN FED TO CATTLE WHOLE BECAUSE
IT CANNOT BE TAKEN TO THE MILL.**

* * * * *

Through correspondence from this and vicinity counties it has been learned that the roads have, during months past, been almost impassable. Business has been impeded, farmers unable to forward produce, and trade in general debarred.

* * * * *

The roads in the vicinity of Castleton are in such a shape that it is impossible for farmers to get into the village at all, and business is what may be termed at a standstill. Outside the villages the condition of the roads is by far worse than in former years.

BUSINESS AT A STANDSTILL.

On account of the rough ruts and the very muddy condition of the roads near Guilderland Centre, which are in the worst condition known in years, farmers find it extremely difficult to reach the market with their produce, in consequence of which business has, for some time back, been very dull in this section.

Farmers found it uphill work to raise money enough to pay taxes this spring, and some of those in debt cannot pay their yearly interest. Merchants are also hard pressed, and have large accounts on their books, which, although good, cannot be paid until roads are put in condition, so farmers can get to market and sell their accumulated produce.

BAD ROADS BEAT THE RECORD.

The roads in East Berne and vicinity are simply indescribable. They are now beginning to mend, but for the past month they have been almost impassable, and for farmers to attempt to carry a load has been entirely out of the question. Nothing but absolute necessity will induce a farmer to go to Albany with a load of produce, and then he finds that 600 or 800 pounds make a heavier burden for his team than 2,400 would with the roads in ordinary condition.

The effect tells seriously on our local merchants. The business at the grist mill suffers because farmers, rather than draw their grain to mill through the deep mud, prefer to feed it to their stock whole. The lumber business has been affected to a greater extent than any other. The winter season is the time when farmers draw logs to the saw-mill to have them sawed into fencing material and for repairing their buildings.

This winter they have been waiting for snow and better roads, until the time has arrived when other duties upon the farm require their attention.

THE CAUSE OF THIS TERRIBLE CONDITION

of the roads is easy of explanation. For the past two months there has not been frost enough in the ground to form a bottom, and the constant travel with frequent rains, has worked the roadbed into mortar, and in many places the

RUTS ARE HUB DEEP.

Nothing like it was ever experienced in that vicinity before. There has never been a season on record when the roads have been bad for so long a period as they have the present season.

The roads near Central Bridge have been almost impassable all winter. So much so that trade has been affected to a great extent. Much of the produce that has always been brought here has been sold for less in places near production. For the past three days, however, they have improved.

The roads in the vicinity of Fonda are in an almost impassable condition, and farmers are unable to bring anything to market if they so desire. As a result, business of all kinds is almost at a standstill. The roads were never in a worse condition than now.

The roads in the vicinity of Clarksville are in a better condition just at present than they have been for the last eight or nine months, which is owing to the absence of rain for a week.

The farmers have been compelled, to a certain extent, to keep their produce at home on account of the condition of the roads. Those residing along the New Scotland plank road, or the Bethlehem turnpike, have the advantage of farmers residing elsewhere. They can go to market at any time, while people in this vicinity are

COMPELLED TO STAY AWAY.

The worst road for the Clarksville farmers is the Delaware turnpike. From the bridge over the Normanskill to the pavement of Delaware avenue, near Bender's brickyard, it has been impassable a number of times. The roads have been worse for the last two years than before, owing to the large amount of rain that has fallen during that time.

The roads in the vicinity of Hartwick Seminary, for the first time in many months, are

ASSUMING A PASSABLE CONDITION.

The past winter, which has been one totally unlike any previous in the memory of the oldest inhabitants, has also been remarkable for the bad condition of roads. In the villages of Milford and Cooperstown the roads in the main streets have been in a terrible condition, and merchants have attributed the depression of business in no small degree to this. With the pleasant weather of the past few days the roads are gradually growing smooth, and, though still having many deep ruts, farmers are traveling much more. Every year the fact is being more clearly shown that some more effective methods must be adopted to secure better roads in our country districts." * * *

From twenty-seven of our States came at that time reports which, without exception described the public roads to be in a condition not unlike those of Albany County. From one of the wealthiest and most populous western States, a State full of resources and endless possibilities for the farmer, came a photograph, taken on an important country road leading into one of the great cities. I might tell you what city it was, but the scene is no worse than could have been found in the

suburbs of a hundred other towns at that time and I have no desire to excite municipal jealousy. Here is the picture. You see the wagon has become hopelessly stuck, and is abandoned by horse and driver. If that horse could talk, what a story we might have! He would tell you a patient tale of pains and trials that you know not of and assure you that a dirt road in a civilized country is as much out of place as a dirt roof.

III.

And so it was—and so it is, all over the country. Last March the farmers of Chester County, Pennsylvania, were using a six-horse team



to draw a single load of hay. On the 21st day of that month one of the "leaders" in that team stumbled and fell in the deep mud and water which covered the road and was drowned before he could be got out. In Montgomery County, Maryland, during the same month, a lady recovered \$2,500 damages from the county for personal injuries received by reason of the bad roads. Costs and disbursements swelled the sum to about \$4,000. But these are only incidents, and they have no force except as illustrations. The real unmitigated iniquity of a mud road must be seen by a more extended view.

Let us try a few statistics. You hate statistics and so do I. Take

them as they go, they are drier than a mouthful of dust, and we both know what that is. But once in a while the Government sends a man round to count things, just to see whether we are all here and how we are getting on ; very much in the same way that we count eggs and chickens and measure rye and oats. We are dealing with a big subject and one which concerns all the people. Let us look at it from a standpoint where everybody can see the inspiring spectacle. I want you to understand, if you do not see it already, that a bad road is really the most expensive thing in your agricultural outfit ; that it is as much behind the times as the hand-loom and the flail and the sickle ; that it has no rightful place in the domain of an intelligent people.

From official Government sources I find that the farmers of this country, in the year 1890, had upon their farms, draft animals as follows : *

| | NUMBER. | VALUE. | AVERAGE PRICE. |
|----------------|------------|-----------------|----------------|
| Horses | 14,213,837 | \$978,516,562 | \$68 00 |
| Mules | 2,331,027 | 182,394,099 | 78 00 |
| Oxen, etc..... | 36,849,024 | 560,625,137 | 15 00 |
| Total..... | 53,393,888 | \$1,721,535,798 | |

Now to simplify matters a little, you see you have nearly \$2,000,000,000 invested in motive power of a perishable, uncertain and expensive kind. Busy or idle these animals must be fed and cared for every day. They are boarders that you can't get rid of when the busy season is over and it stands you in hand to keep them at work. Two thousand millions of dollars make a large sum. Invested at 5 per cent. interest it would produce nearly \$2,000,000 per week. Then you see there are more than sixteen millions of horses and mules alone, and to feed and care for these it costs the modest sum of \$4,000,000 per day. A little while ago a very clever and intelligent citizen of Indiana estimated that bad roads cost the farmer \$15 per year for each horse and mule in his service. This means a loss in the aggregate of nearly \$250,000,000 per year. Add wear and tear of wagons and harnesses, \$100,000,000 ; depreciated value of farm lands \$2,000,000,000 ; total, *twenty three hundred and fifty millions of dollars.*

* These figures are taken from official statistics compiled under direction of the United States Government authorities at Washington.

Making the utmost allowance in favor of the farmer and granting the necessity for the liberal use of horse-power in the maintenance of agricultural traffic, it is easily certain that the farmers of this country are keeping at least two millions of horses more than would be necessary to do all the hauling between farm and market, if only the principle roads were brought to a good condition. If you assume that each of these horses is fed the ordinary army ration of hay and oats, it requires 14,000 tons of hay or fodder and seven hundred and fifty thousand bushels of oats per day to feed these unnecessary animals, which themselves have a money value of \$140,000,000. The value of hay and oats fed to these horses per day is about \$300,000, or something like \$114,000,000 per year.*

IV.

I was down at Hubmire's for a week last April, and we had an occasional friendly argument on this question of better roads. The wet weather had hung on and the wagon roads were then in a desperate condition. Things were dull about the old farm and Hubmire had been dividing his time between chores and trout fishing to keep off the blues. One day he had to go to town. There was something needed in the house and a dozen things to be attended to which could not longer be put off. To kill as many birds as possible with one stone, Hubmire hitched his team to the box wagon with the intention of hauling out a load of coal for the sitting-room stove. I hadn't seen a newspaper for more than a week and was glad of this chance to connect with civilization and find out whether we hadn't skipped a day in the calendar; so I accepted Hubmire's invitation and went with him. It was a slow and painful trip. The clay roads were wet, bottomless and sticky, and the horses struggled along in about the same way that a fly wades in molasses. We passed only one vehicle on all those six miles of road, and that was a hearse. It was about half a mile out of town. The team was tied to the fence and, as we came up, we saw that the driver had left his seat and gone back a short distance where he stood with a fence picket in his hand, reaching out into the mud, and vainly trying to recover an object which seemed to be sunk nearly out of sight in the soft mire. It looked enough like a bottle to be one, but the lone fisherman told Hubmire it was a plume-holder that had "joggled loose," and dropped off the top of the hearse.

* This computation is made by estimating the value of hay at \$10 per ton, and oats at twenty-three cents per bushel; these figures being close to the average value in the several States during the year 1889.

"That's Berriam, the undertaker," said Hubmire; "Guess he's goin' to plant somebody up in the Sokeville district."

"Yes," I replied, wiping a soft clay poultice out of my left eye, "It will be easy digging up in the old graveyard; I wonder how Berriam found out the man was dead."

The subtlety of that joke was too deep for Hubmire. It had never yet occurred to him that there was anything wrong with the roads. He had never seen better ones and he knew that these were as good as the average, take it the State over.

It was the middle of the afternoon before we started for home with our half load of coal, and when we reached the "corners" Hubmire stopped at Rumsey's to water his horses and give them a few minutes rest. The season was a little in advance of fly-time and Rumsey was



taking a comfortable nap in his big arm-chair in the barroom. Our conversation outside, together with the noise of the pump-handle, roused Rumsey to the occasion and, coming out to the doorway, he stretched his arms, legs and jaws by a kind of simultaneous reaching out of all the muscles, pulled his soft hat down in front till the rim made a very sharp angle with the bridge of his nose, threw his head back far enough to enable him to see straight ahead and said:

"Hello, Enoch; glad to see you; come in and warm up a little; how's the goin' down below?"

"Nothin' to brag about," said Hubmire, looking at the sea of

paste which covered his horses and wagon, "beats all what a power of rain we've had this spring; how's business?"

"Hain't made a dollar since the January thaw," said Rumsey; "the mud is so terrible deep folks can't afford to be neighborly, and when they do drop in they don't stop long. It takes about all their time goin' and comin'."

We followed Rumsey into the front room of the hotel and there was a solemn and musty air about the place which was very impressive. It was a "public house" with a suspension of public patronage. From four directions the roads ran in and centered at Rumsey's. Good farming lands stretched away on all sides and every natural condition was favorable to success; but the roads were indescribable. The farmers and country merchants were surrounded and besieged by impassable sloughs of deep mud, and business was wrecked by the bondage of bad roads. Rumsey couldn't see it. He was born in it, reared in it, and it had become a part of his existence. But Rumsey was genial. He had an irrepressible load of good fellowship in his mental cargo and was not disposed to quarrel with natural conditions—of which, to his mind, a mud road was a familiar type. To him all roads were dirt roads, for he had never seen any other. He knew that water was wet, that dirt was soluble, that clay was sticky, and he had always regarded slush and mortar as a kind of visitation from Providence to mankind—"inscrutable" enough to be sure; but nevertheless as certain and unavoidable as the changing seasons themselves. So, in season and out, wet or dry, busy or idle, Rumsey kept a placard over the pepper-sauce bottles in his barroom which read:

"Welcome the coming, speed the parting guest."

V.

That night, when Hubmire had finished his work at the barn, we sat together and smoked. I thought it was a good time to talk with Hubmire about the roads; so I suggested to him that he could do all his plowing and farm work with two horses, and that if there was a good hard road running down to the village he might do all his teaming without adding to that number; that he was now feeding five horses when two or three ought to be enough.

"Now don't," said Hubmire, "don't tell me I've got too many horses; I think I know a thing or two about farmin', and I tell you I hain't got horses enough. My bay team will haul a smashin' good load of hay to town any day, and that's all any man's team 'll do. I

tell you I ain't askin' for better roads than we've got right here in this township." Hubmire thinks a good deal of himself and is a hard man to convince. He never takes a drink at the town pump without first rinsing the dipper, inside and out, and in matters of argument he is just as cautious not to be contaminated by suspicious ideas. But I like Hubmire. We've had many a good day's hunt together in old times, and I've always found him a good companion and a humane sportsman. He is an honest man and a good husband, and there's always hope for a man like that.

So I kept up the fight. I said to him : " Hubmire, you are wrong. I know you keep good horses ; there are none better in the country ; everything about your farm is in the best condition, and there isn't a farmer in the country who has done more hard work in the last twenty years than you have done. Everything that you have found to be of value to the farmer you have added to your possessions, and if I could show you that a good road is the one thing necessary to improve your prosperity you would be the loudest preacher for improved roads in this State. In spite of all your hard work you are not clear of debt. There is a mortgage on your farm and it draws interest night and day ; it eats into your prosperity ; there is something wrong with you and with all your neighbors. Farming is no longer as prosperous as it was in times gone by. The population of many of our agricultural districts is less than it was ten years ago ; the mortgage indebtedness of American farms is increasing at the rate of about eight and a half millions of dollars per year, and the decrease in farm values since 1880 is estimated at \$200,000,000. In the single State of Ohio this loss amounted to about \$7 per acre for the entire State and there are other States where the proportion shows a still worse condition of affairs.

"The country is losing and the towns are gaining ; the farmers are growing poorer ; the Government is growing richer. Every minute, night and day, the United States Government collects \$178 more than it spends. Think of it. Ten thousand six hundred and eighty-six dollars per hour ; \$256,320 per day ; \$7,689,600 per month ; \$93,556,800 per year. Something is wrong. It is not so in other countries. I have been looking it up, and I have at home reports from more than twenty European countries relating to their internal affairs. In those countries the farmers prosper in about the same proportion that prosperity follows other lines of business ; agriculture holds its own, and there is no more independent class of people in those countries than the farmers."

"Now, singularly enough, the most striking difference between those countries and ours is found in the condition of the country roads. With them communication is easy and quickly accomplished. Their governments, instead of rolling up and hoarding a ridiculous surplus, spend large sums in the building and repairing of the country roads. The result is that in Europe the farmers drive 20 to 30 miles from home to market with immense loads, in all kinds of weather, at all seasons of the year and return home the same day. A European horse hauls twice as much as an American horse, simply because the roads are much better. He can visit his neighbors at any time; drive to town; make social calls and enjoy all the personal advantages of a resident in the city and still maintain the independence and pleasures of country life."

"Nonsense," said Hubmire, "I'd like to see the fairyland you're talking about. I have got five as good horses as ever pulled a strap, and I know how to take care of them. I don't drive to town excepting when the roads are good, and then, for hauling loads, my horses won't take a back seat for any man."

"Hubmire," said I, with some impatience, "I see we can never agree on this question till we settle one important difference. You say you never drive to town until the roads are good. Now, leaving out the fact that you are losing plenty of good time while you wait for the mud to dry up, just tell me what you call a good road."

"Well," said Hubmire, "any road is good enough for my horses when the mud begins to stiffen up so it will pack and roll under the wheel."

"Then let me tell you, Hubmire," said I, "that you don't know what a good road is. You never saw a good road in all your life. A good road has no mud to dry, roll or pack. It is made hard and stays hard and smooth at all times of the year, and when once made it is easier and cheaper to keep it in repair than any dirt road you ever saw." But Hubmire only smiled in his good-natured, doubting way, lighted his pipe and went out to do his evening chores.

VI.

That talk with Hubmire troubled me a good deal. He is counted a sensible man in the community where he lives and I could see that his words reflected the judgment of thousands of farmers of whom he was an excellent type. The mud was then drying up in places, or, as Hubmire would say, it was beginning to "pack and roll under the wheel," and

one day, a week later, Hubmire drove to town with his stout span of bays and a load of hay. It wasn't a very big load for the roads were still rutty, and after Hubmire had got into the village the big bays were "packing and rolling" the ruts with a little too much vigor when one of the whiffletrees broke. Hubmire drove down to the blacksmith's shop for necessary repairs, and while he was gone every horse and vagrant cow that came along nipped his load. It stood alone and unprotected, and here is a photograph of that load, showing it exactly as it was.

A month later I went up to see Hubmire again, feeling that I was somewhat better equipped to meet his peculiar style of argument. I showed him this photograph of his abandoned load of hay.



"Hubmire," said I, "whenever I see an American farmer with a load of hay like that, I feel ashamed for my country. You hauled that load to market with your big bays. You thought the road was in fair condition, and it was one of those roads which you say is good enough because the 'mud will roll and pack under the wheel.' Right here is where we disagree. I told you awhile ago that the farm horses of Europe hauled twice as much as your horses, simply because the roads of that continent are better than ours. You seemed to ridicule the idea. I could not convince you by observation or experience and I have taken the trouble to bring you some pictures of European roads, showing them exactly as they are to-day. I have been fortu-

nate enough to find one which admirably serves the case in hand. Here is a picture taken from a photograph of a French road, showing a French farmer with his load of hay, on his way to market, 9 miles distant.

“It will do you good to look at this picture, and I am going to leave it with you for a little while. There are something like 4 tons of hay in that Frenchman’s load, or about $1\frac{1}{4}$ tons for each horse. Notice



the surface of the road. It is hard and smooth, nicely sloped in both directions so as to insure quick drainage; the wheel tires are two and a half times as wide as those on your wagon and they roll over the surface of the road in a manner that tends to make it hard and smooth instead of cutting and creating ruts as is always the case when narrow tires are used. Notice the height of the load; it towers up among the trees, and its immense bulk gives it the appearance of an American haystack; compare its height with the height of the driver who walks

along by the roadside or with the size of the chaise which you see coming along immediately behind. See how easily the horses jog along; they are moving as comfortably as you can wish, and there is no sign of tugging or straining in their movements. If you had a road like that from your farm to town, you might do all your hauling with two horses instead of the five you now have and save yourself an immense expense.

“Now, I want to say to you, that the farmers of this country raised something like 45,000,000 tons of hay last year and every pound of that hay was moved at an expense of twice as much power as ought to be necessary; and you must know, also, that this picture of a French road is by no means a special or uncommon one; such roads may be found anywhere among the better countries of Europe; France alone has about 130,000 miles of roads practically as good as this one, and yet her territory is only about four times as large as that of the State of New York. That Government spends \$18,000,000 a year to keep these roads in repair. The French Republic has adopted an honest principle of State-craft by doing something from year to year in behalf of its farmers; it proceeds upon the theory that these roads are the property and care of all the people; that they are a public necessity and one of the institutions of the Government; that the farmers alone should not bear the burden of making and repairing these lines of travel, which reach from country to town, since the prosperity of both town and country depend upon their condition in a most emphatic degree; that agriculture is everywhere the gauge of national thrift and that the permanent enrichment of the Republic must depend upon the fullest development of its resources. There is a good deal worth thinking about in this matter of national policy. No country ever yet attained greatness whose farmers were not great, and in these days of improvement and driving competition, the farmer has the same right to demand a means for saving time, space, power, materials and expense as are accorded by the Government to other divisions of society.”

VII.

I had many talks with Hubmire before I left the farm, and though he didn't seem to be quite convinced I could see that he had begun to think the matter over, and I am satisfied that Hubmire will work out a sound conclusion. He is a conservative fellow; but he has a slow, sure, tenacious and persevering way of thinking that is sure to land him on good ground when he starts in the right direction.

I have told you of my experience with Hubmire because he is, in

many ways, a typical representative of your class, and what I said to him was, in my honest judgment, applicable to thousands of similar cases to be found in every county of the United States.

The American farmer has nerve, vigor, ambition, industry, good soil, good climate and every natural facility for the successful pursuit of agriculture; but the average American farm is a lonely institution. Its owner is separated from his neighbors, largely denied the many social advantages which belong to people who are able to mingle with each other from day to day, kept at home from many gatherings, social, political and religious, from which he might receive both pleasure and benefit. His sons desert the farm for the more profitable and enlightened conditions of city life, and the allurements of profit which is held out in every community of successful farmers is not so conspicuous in the United States to-day as to entice our farmer's sons from the greater promise of success offered by mercantile occupations.

Farm property is no longer in active demand and investments which in other years would have sought the security afforded by farm mortgages are now directed in other channels. Go to any of the large cities of the Union and you will find upon the books of the real estate dealers an endless array of notices of farms for sale or to exchange for city property.

But I did not intend to digress. It will interest you to know more about the roads of France. In that country there is no such diversity between the material progress of the farmer and that of the merchant—between the country and the town—as is found in this country. The farmers prosper and have always prospered. Every dollar spent by the French Government to bring itself more closely in touch with its rural population, has been well invested. You remember that terrible war when from Prussia, the King, the warrior and the statesman led the German legions across the breadth of the French Empire and forced the capitulation of Paris; and how the brave Frenchmen were humiliated by the exacting terms of peace which their conquerors imposed. The immense tribute demanded by the Germans at the close of that war, now twenty years ago, was made up from moneys contributed in a wonderful degree by the French farmers, and the admiration of the world which their patriotism excited in the payment of that tribute, was not greater than the wonder which everybody felt at the ready thrift which had enabled them to meet such enormous demands.

Here is a picture showing a valley near one of the small villages in the interior of France. The scene is about 50 miles northwesterly from Paris, not far from Amiens, which many years ago was a fortified

city; but the ramparts have been torn down and replaced by splendid roadways, adding to the beauty and thrift of the city and to the convenience and pleasure of its people.

In the foreground you see the same kind of hard, smooth road that is shown in the last picture. In the distance, running down from the hills and through the valley, you see a white line of road, showing the various directions in which these roads run and the uniform appearance which their hard finished surfaces present.

Of course these roads of France are not built by farmers who "work out" their highway taxes after the manner followed in this country,



nor are they repaired by the use of plows, hoes or scrapers like those which are brought into use at the annual farmer's picnic which takes place when you go out to "work the road" in your township. On the contrary, they are built and kept up under a system which is perhaps the most perfect in the world. There is an official-in-chief, who takes charge of all the main roads of the Republic and requires from his subordinates complete reports at frequent intervals. In this manner information is always at hand showing the condition of the roads in all parts of the country. Of course, the work is divided into different sections, which, in turn, are in charge of subordinate engineers or su-

perintendents. Broken stone is furnished by contract, and considering the amount of labor accomplished each year on the French roads, the cost is surprisingly small. The roads of our own States, at least the important roads, should be maintained in the same way. The inefficient, haphazard and ridiculously expensive method which we have followed for the last hundred years, should have convinced us by this time of the necessity of change. Of course I may be wrong about this, because it has never yet been determined just how long it takes a great and intelligent people to twist itself out of the rut of an accepted and established blunder. Upon this point, a keen and witty observer



of public affairs says: "A hundred years is a very little time for the duration of a national error, and it is so far from being reasonable to look for its decay at so short a date, that it can hardly be expected, within such limits, to have displayed the full bloom of its imbecility."

VIII.

When I write to you about these roads of Europe I know that you are apt to believe that these European countries are more wealthy than ours; that they are more thickly populated; more thoroughly cultivated; and that these splendid roads are built for the accommodation of only those farmers whose lands are highly cultivated; but

in this you are wrong. France is divided into eighty-seven "departments" or political divisions, which, in many respects, are not unlike our counties. In eighty-one of these eighty-seven departments the population per square mile is less than that of the State of Rhode Island; in seventy-eight it is less than the population per square mile of Massachusetts; in sixty-six it is less than that of New Jersey, while if you take the combined area of New York, Pennsylvania, Connecti-



cut, Massachusetts, Rhode Island and New Jersey it will appear that the average population per square mile of these States exceeds that of seventy out of the eighty-seven departments of France. Many of these departments in France are less populous than the thickly settled counties in our western States, but the uniform excellence of the roads is everywhere maintained. On page 26 is a picture taken in one of the forests of France, where you see no signs of cultivation and where many of the best farms are in fact some miles distant from town.

You see in this picture the same excellent quality of road as that which appears in the ones I have already shown you.

Many years ago the French farmer had the same method of making and repairing the wagon roads that is followed in your county to-day. He quit farming for several days each year and "worked out" his road tax.

Do you think he could be induced to go back to the old style of doing things? Look at the picture on page 27 copied from a photograph of a French road taken last year on the day after a heavy rain storm. The road surface is smooth and dry; the tall poplars on either side have been trimmed to the upper branches so as to let in the sun and air and hasten the drying of the road after a storm. Then notice the heaps of broken stone on each side of the road. These are used by the workmen in making constant repairs from day to day whenever the least imperfection appears.

In Belgium also the principal roads are built and maintained by the general government, and in 1880 in the nine provinces of Belgium over 79 per cent. of the highroads were of this class, the entire length of high-class roads being 4,173 English miles, out of a total of five thousand two hundred and eighty-six of roads of all classes. The best roads of Belgium are in the provinces of Namur, Liège and Luxembourg, and permanent employees are kept on the roads under the direction of the chief engineer of the province, for the purpose of insuring the observance of the regulations and looking after the constant repair of the highways.

In Baden the main roads are under the supervision of the State authorities, and are cared for with a studious regard for the requirements of the farmer and inland travel. Under the law relating to roads in Baden, the duty of maintaining the road falls as follows: One quarter each upon the parish (town) and district (county) in which the road is situated. The remaining one-half upon the State treasury.

In Hesse-Darmstadt the roads are divided into two classes, called State roads and district roads, of which the former are a direct care and charge upon the general government, and when the district roads become so important as to require the attention of State officers, they can, under direction of the district assembly ("Kreistag") be declared State roads. Every district is bound to appoint the necessary officials connected with the district roads. These officials consist of a skilled person who must be capable of filling the office of district overseer and a proper force of laborers requisite for the work in hand. Annual

sums are allotted to each province out of the State budget to pay the cost of making and maintaining the public roads.

In Italy the Minister of Public Works is at the head of the Department of Public Roads. The construction of these roads is, in most cases, undertaken by contracts, the work being carried on under direction of Government engineers. These contracts extend also to the work of maintenance and repair, and include the transport of materials, the cost of earth works, embankments, drainage, masonry, iron-work, stonework, removal of snow, mud and dust and the care of border trees planted along the sides of the highways. The contractor



COUNTRY ROAD IN ITALY.

is bound to deposit a fixed sum of money in the hands of the public officials, to insure the performance of his contract, and on the termination of a contract, the road must be delivered up in perfect order and repair to answer the description contained in the specifications, and all defects becoming apparent within one month thereafter, are made good at the cost of the contractor, under an estimate of the chief engineer of the district. The money deposit of the contractor is only returned to him upon the compliance of all the terms of his contract and in case of his neglect or refusal to execute the orders conveyed

to him by the highway officials, the latter have power to direct the necessary work to be carried on at the expense of the contractor. A repetition of such offense or the perpetration of any fault on the part of the contractor, results in the termination of his contract and the confiscation of his money deposit. The Government road laborers are called "Cantonniers" and are selected with great care, special reference being had to character and honesty. They must be of robust constitution and must be able to read and write. Each one of these cantonniers is provided with a full set of tools and implements specified by law. His hours of work are from sunrise to sunset, and each day he is obliged to go over the entire track of road placed in his charge. He must be constantly upon the line of his work in all kinds of weather, and in case of necessity, is bound to work on public holidays. His chief duties are the leveling and repair of the highways; the removal of snow, mud, dust, etc. He must assist travelers in distress and vehicles disabled by accident or by weather, and for any neglect of duty, he may be fined, suspended or dismissed, according to the degree of the offense. The fines accumulated during the year are divided among the deserving cantonniers or given to one of the mutual benefit associations, of which they are members. Cantonniers who serve with credit and distinction for three or more years are promoted and given an increase of monthly wages. In the five years from 1873 to 1878, Italy spent about \$16,000,000 on her roads, although before that appropriation was made, many excellent highways existed in all parts of the kingdom. In 1881 Italy constructed about 120 miles of new road and had then about 11,040 miles in course of construction. Mentioning the policy of the Italian Government with respect to its maintenance of the public roads, Mr. Beauclerk, representing the British Government at Rome in the year 1882, in his official report to the home cabinet, said: "It is therefore evident that the Italian Government are doing their utmost to develop rapidly and extensively the means of communication in the kingdom, and there is little doubt that the large outlay incurred, is fully justified by the increased prosperity and wealth of the country." At that time, something more than 5,000 miles of roads were in charge of the Italian Government. More than twenty-five hundred cantonniers were employed and their services were devoted to the care of all the national roads, except five.

In the Netherlands, as in the countries already mentioned, the principal roads are maintained at the expense of the State.

In Portugal a similar rule is adopted. The State takes the responsi-

bility of the construction, maintenance and service of all important roads connecting the provincial capital and the principal frontier towns. The director of public works and skilled engineers have the principal direction of the Government work, relating to the common roads.

IX.

It is interesting to note that while some unimportant differences exist among European countries in the details of management and maintenance of the public roads, these countries are practically unani-



mous in their policy of placing the important roads under the direct management of the general government and of paying the expenses of construction and maintenance out of the general funds of the State. The result has been most salutary. The splendid facilities for the moving of travel and traffic over these improved roads, has proved the wisdom of placing the important roads under the care of skilled engineers and workmen, and the object lesson thus taught has borne fruit in the wonderful improvement of the provincial road, which are maintained under management of the local authorities. It is no uncommon thing in France, Baden, Germany, Austria or Italy to see loads, weigh-

ing in the aggregate from three to four times the load hauled by the ordinary farm team in our country, while the distances frequently traveled by the European draft horse with these immense loads are so much greater than the maximum attempted by the American farmer as to be almost beyond belief. On page 31 I show you a picture reproduced from a photograph, taken within the last year, upon one of the German roads. Here is a view showing a loaded two-wheeled cart, drawn by two horses, and bearing six large casks of wine, a load weighing in the aggregate several tons.

It needs only a casual view of this picture to show how easily this immense load is rolled over the smooth surface of the highway, and with what little effort the horses are able to perform their task. Thousands of miles of these roads exist in all parts of Europe; and so jealously are they regarded that no policy of State Government seems to be in favor which does not include a proper care for the country roads.

Two-wheeled carts are in very common use among the farmers of Europe, just as they are in some parts of our own country. They hitch their horses one before the other in "tandem" style, and most of their heavy loads are hauled in this way. Now let me show you a picture of an American tandem work team with an American load on an American public highway. Here you have it :



This picture was taken within five miles of the public buildings of one of the largest cities in the United States. The load contains only

400 bricks, which is considerably less than a fair load for one horse on a good road. The team has stopped to "blow," and double time is wasted in that way. These are the roads that make business unprofitable. They wear out horses, harnesses and humanity, kill patience, and keep you at the public house, when a better road would enable you to quicken your trip and save expense by dining with your family at home.

Your old friend, Horace Greeley, used to enliven his argument for better roads by relating the story of a farmer who took a drove of hogs a very long way to market, and found the delays and difficulties of his trip to be so expensive that he was compelled to dispose of his hogs at a considerable loss. On reaching home one of his enterprising neighbors, who had some thought of trying the pork-raising business himself, asked him how much he had cleared in his enterprise.

"Well," he replied after some reflection, "I had the company of the hogs."

Now compare the Philadelphia picture on page 32 (I really didn't mean to disclose the name of that city) with the last one before it, and take note of the fact that the German load is fully five or six times as great as the American load, and that this difference is due entirely to the difference between the road surfaces shown in the two pictures. You see there is no theory or guesswork in this matter which is not doubly proved by actual facts. You can't afford to do business with no better hope of profit than "the company of the hogs."

In lower Austria, near Vienna, where the material for road-making is not found to be conveniently at hand, the Government offered a very substantial reward a few years ago for the discovery of a solid and suitable substance which might be used in the improvement of the roads. The Austrians employ several thousand road cleaners regularly, together with a suitable number of inspectors and maintain a system of continual repair, clearing off the dust and mud as fast as it accumulates, and repairing the slightest defect in the road, so as to prevent the formation of ruts.

In Hungary the State roads are under the management of the ministry of public works, while the country and parish roads are kept up by local management.

In Bavaria the Government roads are made and kept in repair at the expense of the State, the money being voted by the legislative bodies of the Landtag. To prevent these roads being cut up a strin-

gent law is enforced against the use of narrow wheel tires, and the width of tire to be used is laid down as follows:*

| | |
|--------------------------------------|-----------|
| Two wheel wagon with two horses..... | 4 inches. |
| Two " " three or four horses..... | 6 " |
| Four " " horses | 2½ " |
| Four " " three or four horses..... | 4 " |
| Five " " five to eight horses..... | 6 " |

Carts having more than four horses, and wagons having more than eight are not allowed upon the public roads, except by special permission obtained from the authorities of the province. Fruit trees are planted along the sides of the roads under favorable conditions, and these are given into the care of the roadmen with permission to exhibit at the various fairs, where prizes are awarded for excellence of the samples.

X.

I have heard American farmers say that they were opposed to having the public roads put in charge of civil engineers ; that they had no desire to be " scientific " and were opposed to " scientific " management of the public roads. I think I have heard you say this. Let me tell you in the most friendly way in the world that you could not, to save your soul, help being scientific. You are scientific when you paint your house, put tallow on your boots, grease on your wagon-axle, hone your razor, smoke your hams, fumigate your hennery, or take peppermint for the stomach ache. That patent incubator of yours is a perfect marvel of science. It is not wise to think a man is more scientific than you are simply because he may know a thing or two in his particular line of business which you do not. He might object to your knowledge for the same reason, for in many things your superior wisdom makes you more scientific than he is. Besides, your average civil engineer is likely to be one of the best fellows in the world ; and if he is worth his salt you will find him wide-awake, practical and interesting ; democratic in his ways, plain in his dress, and with a head full of good sense. He is always looking for ideas and he will concede your superior knowledge of farming and be glad to learn of any valuable thing that you may tell him. He may not know the difference between timothy and mullen stalks but he can show you how to build a road as good as the best in the world and one that will last for

* These widths are here expressed in inches for the convenience of the American reader. They are reduced from the dimensions given in the Bavarian statute, where they are expressed in centimetres. The dimensions given above are practically the same as specified in the statute, the greatest variation being about one-tenth of an inch.

forty generations. He will tell you that it needs something besides horse power, axle-grease and profanity to move a loaded wagon from farm to market ; that the harder and smoother your road is made the shorter your distance becomes from farm to town, and the less power will be required to haul your produce.

Did you ever wonder why it is that the great railroads of the country are constantly improving their roadbeds, adopting improved rails and employing "section gangs" to constantly keep their tracks in the best condition? I will tell you why it is. Years ago it was found that the cost of running a great railroad line was decreased by every improvement which tended to lessen the grades and make the track smooth and hard ; and the best engineering talent in the world has been employed to bring these railroads to their present condition of excellence. Twenty-five years ago, before the general adoption of the long, solid-faced steel rail, the power required to move the rolling stock was considerably greater than at present. In 1870 it cost the New York Central Railroad Company about one and one-sixth cents to move each ton of freight over 1 mile of railroad. This seems a very small sum, but as small as it may appear it was reduced in 1889 to about five mills. Other railroad lines show a corresponding decrease in running expenses, all due to the improvement of the tracks or roadbed.

The practical conclusion is this: a good roadbed pays ; it saves power, shortens distance and time, increases speed, insures comfort and safety, and is, in whatever way you state it, a good investment. Now, the wagon by which you haul your loads to market bears the same relation to the road that the railroad car bears to the steel track ; the car and the wagon are both vehicles, and in the earlier days of railway traffic railway cars were drawn by horses just as wagons are drawn upon the common road, and just as street cars are now drawn in the cities. The ordinary street car, drawn by two horses, weighs 5,000 pounds ; the open car used in summer will seat fifty passengers, weighing 7,000 pounds ; total, 12,000 pounds, or 6 net tons, and this load is drawn by a team at the rate of 6 miles an hour without difficulty. The wheels of your wagon are made round and true ; they turn upon axles as smooth and well lubricated as those of a car ; your horses are as good as those employed in the street car service, and you have every facility for moving large loads quickly and cheaply, except the single requirement of a good road. Of course I do not intend to argue that wagon loads can be hauled upon a high-class road as cheaply as upon the steel railroad

track, but I have shown you enough to convince you that the ordinary dirt road is in no way fitted for your business and that a wonderful contrast exists between such a road and the well-made highways of other countries.

Another thing which your engineer will teach you is that work to be done cheaply must be done in a systematic way ; that the cheapest way to care for a road and to keep it in repair is to place it in charge of some person who will be held responsible for its condition throughout the entire year. In your township the roads are mended or "worked" once, or at the most twice a year, and for the balance of the season are neglected. Even when the warm weather of spring has dried up a considerable portion of the road so as to make it fairly



passable, great mud holes are found here and there in which the farmers frequently become stuck with heavy loads, causing no end of delay and trouble. Here is a picture taken on one of the busiest farm roads in this country, showing just the kind of mud hole I am writing about. This picture was taken long after the frost had left the ground and it simply shows the kind of neglect which exists all over this country and which grows out of the inefficient, shiftless and irresponsible methods by which our country roads are cared for. A chain is no stronger than its weakest link and a road is little better than its deepest mud-hole.

If you look at this picture you will see that the bank slopes off on either side toward the creek which runs under the bridge. Twenty

minutes' work with a pick and shovel would have drained that water from the road, and yet it had stood there for several days at the time when this picture was taken.

You might be able to haul a ton of hay over that dirt road for a mile on either side of this mud-hole and yet your team would be stuck at this point with a load of half that size.

And so you see that this is, after all, an important question and one which most of all concerns the farmer. Look at it in another way. Suppose that you and half a dozen of your clear-headed neighbors should form a kind of partnership and make a contract with all the other farmers in your county by which you should be required for a period of ten years to do all the hauling of farm produce between country and town. You would find that under present conditions you would have to feed and care for ten thousand horses every day; that you would have five thousand wagons to keep in repair, besides an immense number of harnesses; that you would be required to employ a great number of drivers; that your bills for horse feed, harnesses, repairs, blacksmithing, etc., etc., would be a constant and enormous drain upon your resources, and that for several months in each year your work would be done at an enormous loss. Suppose that you should sit down with your copartners for the purpose of devising a way of curtailing expenses and making the business profitable. Clearly enough the first suggestion in order would be that of reducing the number of horses and hired help and of devising some way by which more and quicker trips could be made and larger loads hauled between farm and market. There is one way in which this could be done and which stands prominently above all others, and I will leave you to consider what that is. Every State is a kind of partnership, a kind of corporation, in which we all hold more or less stock, and in which, as intelligent citizens, it is our duty to devise means for carrying on the State business with as little loss and as much gain as possible.

XI.

You know that the great volume of internal trade in every State is the common road trade. It exceeds by millions of tons the entire carrying trade of the railroads; for, in addition to the fact that the great volume of freight carried by the railroads is, in the first instance, carted in one form or another over the common highways of the country, you know that enormous quantities of produce of all kinds are wheeled over the common roads under the requirements of local trade

in rural sections, and that these vast quantities of produce consumed in the local market have no connection whatever with the railroad traffic. And so it becomes important to inquire in what manner this great carrying trade which is constantly going on over the common roads and which supplies not only the immense freighting business of the great railroads, but the more important inter-communication between neighbors in the local market, can be carried on with best facilities and with least cost. I have tried to show you that upon this question of economy the great railroad corporations of the country



have established a valuable precedent. Each of these corporations is in the business to make money. Their one object is to give little and get much; and yet, in spite of the gradually reduced rates charged by the great trunk lines to the general public, they have steadily increased in prosperity till the enormous wealth of many of these companies has become the wonder of the century. These railroad corporations began business in a crude, undeveloped, and in some cases unsystematic way. Their desire for gain sharpened their wits; they experimented, and by experiments they found that the greatest saving of expense in the management of their railroads was to be attained by the adoption of easy grades and by adding to the smoothness and

hardness of the roadbed. These two qualities of smoothness and hardness are the essentials of a good wagon road. You cannot have and keep such roads without good laws and intelligent supervision. Here is another picture, showing one of the roads of Brittany. Did you ever see a road like that?

It is made to last for all time, and is kept in repair at half the cost and labor expended on the average dirt road of this country. It is looked after with the same system and care that are bestowed in the management of the other departments of government, and every farmer living on the long line of that splendid roadway is happy and independent in the consciousness that he is every day and every way in touch with the great world of business and society.

XII.

It may be interesting for you to know that the exact difference in power required to move a given load over different kinds of road surface, has been determined many times, and so often verified as to be well settled. From these experiments you may know that on the smooth surface of a Macadam road one horse will haul twice the load that the same horse could haul on the best dirt road, and from five to ten times as much as can be hauled by a single horse when the dirt road is covered with soft mud and ruts. From this you will understand that the value even of a dirt road depends very largely upon its condition and the care with which it is kept in good repair.

And right here, I must say to you, that the great destroyers of the common earth roads are water and narrow wheel tires. In the first place, these roads are, as a rule, wretchedly drained, or in many cases not drained at all. If a deep side ditch could be maintained on each side of the ordinary dirt road, and kept clear so as to receive and carry off the running water, the quality of the road would be improved, in most cases 100 per cent. This is a point which farmers seem to meagerly understand, or, at all events, one which they rarely put to practical use. Water has no place in any road, good or bad. It is more hurtful than any other agent of destruction. It should be carried off and out of every road as soon as it falls if possible. Now, as to wheel tires, let me remind you that you said a little while ago that a road was good enough for your purpose whenever the mud would roll and pack under the wheel; and by this I understand that you look upon your wheel as a roller. So it is. Every road becomes smooth by the application of a roller, and this smoothing process is hastened or retarded by the quality of the roller

itself. If you have a wheel tire $1\frac{1}{2}$ inches wide, like those upon your farm wagon, every time you go down the road with a ton of produce, your wagon wheels sink into the soft mud, form ruts and tend to keep the road in a rough condition. Your $1\frac{1}{2}$ -inch "roller" will not profitably exert its rolling qualities until the mud becomes nearly dry. A wider wheel tire would serve your purpose much better; and if the farmers of your county would use wheel tires 3 or 4 inches wide, as are used abroad, your dirt road would be rolled into passable condition in half the time that is now required to accomplish this result.

Next to water, nothing is so destructive of a good road surface as a heavy vehicle running on narrow wheels. It has been proven over and over again that wheels with $4\frac{1}{2}$ -inch tires cause only one-half the wear on a road that results from the use of wheels with $2\frac{1}{2}$ -inch tires. It used to be the rule in England to make the tire 1 inch wide for every 500 pounds of load or vehicle; that is, if the vehicle and load weighed 2 tons, 4-inch tires would be used; but it was not found profitable to increase the width much beyond $4\frac{1}{2}$ inches, except in cases where wagons were used without springs, when they were sometimes made as wide as 6 inches.

You ought to treat this matter of wheel tires as you do other things in which you are interested, and give it the same sensible consideration that you apply to the things about your home. When you built your house you commenced by putting down a 16-inch stone foundation, and on that you built the framework of the superstructure. You made the foundation broad to prevent the settling of a load which was intended to remain unmoved as long as it should last, and yet you should know that the weight per inch upon that foundation is less than one-quarter the weight per inch upon your narrow wheel tires when you go to market with a heavy load, to say nothing of the fact that your wagon carries a moving load and is therefore much more likely to disturb the foundation than though it remained quiet. Your wheel tire is designed to touch the ground at one point only, and when it is pressed into the earth so as to increase this point of contact, the power required to move a wagon and its load increases very rapidly. You should use wide-wheel tires, and should encourage your neighbors to use them also.

Another thing in connection with the use of dirt roads is this: the ruts in every dirt road are multiplied and made deeper and more troublesome simply because the hind wheels of the ordinary farm wagon "track" the front ones; that is, when the wagon goes straight ahead a small rut is made by the front wheels, and the hind wheels

coming along in the same track enlarge and deepen the rut. Now you may easily see that if the hind wheels were placed a couple of inches farther apart than the front wheels, they would tend to rub out or wear off the edges of the ruts made by the front wheels, and the result would be that the roads would sooner become smooth and passable. You never saw wagon ruts at a turn in the road, did you? The reason of this is that when a wagon is turning the hind wheels do not follow in the tracks made by the front wheels. On these three points of bad drainage, narrow-wheel tires and "tracking" wheels hang many of the miseries and defects of a dirt road.

Two years ago the people living in the suburbs of a Pennsylvania town put down a mile or two of material intended for "Macadam."



It was a fairly good substance, but wholly unlike Macadam in form and finish, and, worst of all, it was left to settle and harden under the wagon wheels of passing traffic. In a short time the narrow-wheel tires worked the usual result, and several lines of deep ruts were formed, running throughout the entire length of the new roadway. Here is a picture of that road as it appears to-day. It shows more clearly than any argument I might offer the evil done by narrow-wheel tires.

XIII.

Sometimes I hear it charged by thoughtless farmers that the railroads are largely responsible for the existing misfortunes of farm life, and that the freighting of grain and similar products from the im-

mense and fertile farms bordering along railroad lines at low rates, has killed the business of farmers who own smaller and less productive farms, and shut them out of competition. I have also heard the opposite view maintained by other farmers, who assert that the railway freights are altogether too high, and that if these were reduced a farmer could ship his produce to distant points and still realize a comfortable profit. The railroad is the best friend the farmer ever had. It has enriched this country beyond a limit that could possibly have been attained before railroads were constructed. Your grandfather used to haul wheat 200 miles in a farm wagon and sell it for thirty-five cents a bushel. His farm had no fence to inclose it; his stock were protected by only a most primitive shed, and everything about his home life was conducted on a miserable and undeveloped scale. If you are living 6 miles from a railroad on an upland farm with gravelly soil, you cannot expect to raise corn and wheat as cheaply as the farmer who plants his crops in the black loam of the prairie and reaps a thousand acres at every harvest. His farm is perhaps close to the railroad station, and the railroad will haul his grain from Chicago to New York at twenty cents per 100 pounds, and make a handsome profit by the operation. With that sort of competition you will never grow rich at farming. Don't concern yourself too much about through freights. Look out for local freights and the cost of transportation right at home in your own county. It costs you more money to haul a ton of produce from your farm to the railroad station than it costs the railroad company to haul the same amount 1,500 miles. You are both using the same power. The main difference is in the track. When you are about to buy a steam engine to perform a given service the manufacturer tells you that you need an engine of say ten "horse-power." Steam tugs, passenger boats, steam pumps, steam locomotives, and all kinds of steam engines are rated according to the "horse-power" which they develop. All this came from the old custom of ascertaining the exact amount of work which a horse could do under certain conditions and comparing it with the steam engine. You haul your loads to market by horse-power; and if you give your horse-power the same chance to work its results to the best advantage, you will find that local expenses and home freights will be diminished in a wonderful degree.

Another thing; if you find it unprofitable to raise wheat and oats try garden vegetables or dairy farming; raise fruits and berries and sell them at home at the nearest market. The distant farmer who works the mellow soil of the prairie cannot deliver fresh fruits and vegetables,

eggs, butter and milk at your county seat as cheaply as you can do it, nor in most cases can he do so at all. Study the capacity of your farm and see if your soil and other conditions are not adapted to this kind of industry. One thing you must remember, however, it is an indispensable condition to the successful market gardener and dairy farmer that he should deliver his goods in the local market regularly at all seasons of the year, without regard to weather or the condition of the roads. Wherever a large town is found in which any sort of thrift has been established, there is a demand for the best quality of farm produce. Fresh butter, eggs, vegetables and fruits, if raised close at hand command a much better price than those brought from a distance and subjected to the trials of railroad freighting, delays and repeated handling. The distant farmer cannot compete with you in these lines and if your town customers can be made to see that the home supply is reliable and constant, the home farmers will control that market.

Last March (1891) the Government at Washington issued a very interesting census bulletin on the subject of "Truck Farming." Every farmer should read it. I will quote from the last paragraph of this bulletin, just enough to show you a bit of enlightened opinion on the point which I have just been urging. The author says :

"Taken in its entirety, this comparatively new industry is found
 "to be in a healthy, prosperous condition. New sections are being
 "developed from year to year that to a certain extent affect the pros-
 "perity of some of the older ones, and there is likely to be more or
 "less shifting of trucking centers every few years, all upon advancing
 "lines, however. New and better methods of culture, with the future
 "invention of labor-saving machinery, must of necessity reduce the
 "cost of production. *Better transportation facilities will place the*
 "*products of these farms in cities and towns more promptly, in better*
 "*condition, and at less cost, while the ever increasing population and*
 "*wealth of the cities and towns insure a greatly increased consumption*
 "*at satisfactory prices for first-class productions."*

XIV.

Of course you know that the distance of any farm from the nearest market affects its value. If located within a short distance of the town, it is worth much more than a farm of the same quality six miles distant. The reason of this is that the farmer nearest the town has many advantages which the more remote farmer has not. He can haul his load to market in a shorter time and save much labor in mar-

keting his crops. His social advantages are increased and he is possessed of many opportunities which would have been denied him had his farm been located any considerable distance from the town. But you know also that nothing shortens distance and saves time to the traveler as improved methods of quickening traffic and the means of transit upon which the traveler relies. It used to be a long week's journey for the American farmer to travel two hundred miles by wagon road to the nearest city, and since the railroad enables him to cover the same distance in five hours, he feels that his farm and home are so much nearer to the great center of trade and that its value has been enhanced accordingly. If you could drive over the six miles of wagon road between your house and the village in one hour at all times of the year, and haul a full load of farm produce into the bargain, you would feel your farm has been moved considerably nearer the market than it now seems to be and its value would feel the benefit of that difference. There is no guess work about this statement. It is a result which has always followed the construction of good roads. I could tell you of a hundred instances, but one or two will answer our purpose here.

Not very many years ago, in the State of New Jersey, there were three or four small towns in which the community was made up of a plodding population in moderate circumstances, doing business on a low scale, in accordance with their poor facilities for communication. When the mud was hub deep the patient New Jersey farmer who lived in those towns stayed at home and waited for the roads to dry up. No matter what might be the prevailing prices in town, he had no means of taking substantial advantage of them. Meanwhile, the consumers in the cities and villages depended in a measure upon the supply of country produce raised in that vicinity, and in times when the farmers were tied up by the bondage of bad roads, they were oppressed by a slack supply and consequently by enhanced prices. Trade was uncertain and farming was carried on with indifferent success. If you could go with me to those towns to-day you would find a marvelous transformation. From a collection of farms at one time connected by dirt roads, there has, in the last few years, sprung up one of the richest farming and residence localities in the United States. Many rich people have moved their homes to these towns and a flourishing condition of things has taken the place of the easy going and slipshod methods which existed in the days of the dirt roads. The prime reason of all this improvement is familiar to every resident who lives in those towns to-day. The beginning of prosperity began with the

construction of the first improved road. Land values increased, traffic was quickened and enlarged, social communication became more easy and more frequent, schools, churches, shops, market places and railroad stations became more accessible and the country in consequence more attractive as a place of residence.

One of the oldest inhabitants of that section*, in an interview relating to the roads in his county, a short time ago, made a practical explanation which his long residence and familiar knowledge makes worthy to be repeated. He stated that the common idea that the roads of these towns are well paved because rich people had come there was erroneous, and declared that rich men had come there simply because the roads were well paved ; that it had been found by the New Jersey people of his town that a team could pull twice as much over a smooth road as over the average dirt road and pull it twice as rapidly ; that he himself had teams at the time of that interview hauling stone to the



new "Prudential Building," and that these teams were drawing 6,500 pounds to a load ; that he knew by experience that the roads which they were using were hard and smooth and that these teams could not draw more than 3,000 pounds over the dirt road. Speaking of the general increase of land values brought about by the adoption of improved roads in the State of New Jersey, the same gentleman went on to mention the result of good roads in Union County, New Jersey, and stated that a few years ago certain lands belonging to his own brother (about 123 acres) was valued at from \$50 to \$75 an acre, but that the owner was unable to sell it at even that price. The farm was unprofitable ; bad roads made it difficult and expensive to get the farm products to market and the profits were insufficient to pay a fair rate of interest on the estimated value of the land. Every day that he owned that farm he became poorer.

* Mr. Thomas Nevins.

XV.

One day the "road improvement craze" took hold of the people in Union County, and about sixty miles of Telford roads were put down. The result was that his brother had just received an offer of \$200 an acre for the old farm which he had vainly offered to sell for from \$50 to \$75 per acre. Moreover, the farm became profitable.



To be sure, there was a little increase of taxes, but the owner of a farm the value of which had been increased \$125 per acre could hardly complain of the slight increase of taxes, which was, after all, quite inconsiderable. The whole subject was summed up by a statement in these words: "Why, there are fully 600 miles of Telford roads in the

“State of New Jersey, and I know what I am talking about when I say that *the increase in land values brought about in Union County alone would pay six times over the cost of every foot of stone road put down in the State.*”

Last month I received a photograph showing one of the roads of Union County, and I am glad to be able to produce it here for your benefit. The next time you are besieged and tied up at home by bad roads just sit down and look at this picture, and take my assurance that you can have just as good ones in your county if ever you have the courage to go about it.

At another time the same gentleman stated a little incident in his personal experience which might well be here related. He said that a few years previous he had bought forty-five acres of land for \$1,500 per acre not far from Orange. He opened up the land and put in the best kind of Telford road. This, with other improvements, brought the expense of the land up to about \$10 a front foot. He sold that land pretty nearly as fast as he could draw up the deeds and none of it brought less than \$30 a front foot. The party from whom he had purchased the forty-five acres still owned seventeen acres on the other side of the road and had offered it for sale at \$1,200 per acre before the new road was put down. A year later the purchaser of the forty-five acres bought the seventeen acre piece at \$2,000 an acre, and in less than two months afterwards sold enough of it to pay the purchase price and the cost of all improvements, and still retained a portion of the seventeen-acre piece for which he was then offered \$100,000. He adds: “This is only one instance of what road improvement has done for me, and it will act the same way for any individual or any community that takes it up in an intelligent way.”

Let me cite another instance showing the benefits resulting from improved roads; this one in the State of Indiana.

In Parke County, in that State, much improvement in this line has been shown, and the practical results of good roads have created a general demand for their extension in other parts of the county. It used to be the custom of farmers in that section to “work” the roads in the same manner and with the same ignorant attention to the work in hand that had been given it by their fathers and forefathers away back to the feudal times in English history. They went out on that streak of disturbed soil which by force of custom they called a “road,” and under pressure of annual assessment proceeded to scrape and maul the soil for three or four hours per day. When the farmer was too busy to indulge in this annual diversion with the neighbors, it was

permitted that two of his boys were allowed as a substitute for their father, and one of these "substitutes," writing at a later day, says: "It was as good as a holiday." One day it came to pass that two or three theorists and cranks began to talk to the people of Parke County about constructing turnpikes and gravel roads. They were met by arguments which the good people of Parke County would be ashamed to have repeated here, and they made few converts. Finally one enthusiast in the county built a mile of gravel road and paid for it out of his private purse. He was a radical on the road question and wished to convince his neighbors; but they only made fun of his efforts and plunged along in the mud till it became apparent that there was only one mile of good road in the entire county. This mile of good road preached a powerful sermon. It was a better argument and made



IMPROVED FARM ROAD IN PARKE COUNTY, INDIANA.

more converts than all that had been talked and written to those people for generations. A wave of common sense rolled over into Parke County which contained at that time the muddiest road in the State. A few enterprising people led the movement for an improvement of this road, and in a short time a solid highway was completed over which the farmers drew their loads with ease, pleasure and profit. This road was the second convincing argument in that part of the county and it routed the opposition. The people found that nothing served to increase their individual and collective prosperity so much as good roads, and in a few years seven splendid gravel pikes were completed, all leading to the county seat, while all main roads in the county and the worst portions of the cross roads were well graveled.

A writer*, whose early years were spent in this county, relating the great benefit which accrued by reason of the better system of roads, writes as follows :

“The common roads were also greatly improved, and to one who left the country, as I did in 1867, and crossed it only by rail till 1879, the change was wonderful. Country travel had become a delight. Those who had been there all the time could not appreciate it so highly, and the ‘old fogies’ were still kicking against every new road.

“To me there was something amusing in noting how many results there were which no one had anticipated. Of course the farmers hauled much bigger loads, and did it in March more easily than in August; wagons lasted a great deal longer; horses were rarely injured, and so it paid to keep better stock, and, what was of very great importance, markets could be reached at any season. But the most striking results were purely social, so much so as to suggest a revised text, thus: ‘Easy communications increase good manners.’ Good highways are certainly the prime factor in civilization.

“The farmers, formerly isolated for weeks together, discovered that they could go where they would with ease, and at the very season when they had the most leisure. To ride a few miles after supper was an actual pleasure, and soon almost every school district had its social or religious, literary or political organization, and some had all four. There were lyceums, lectures and joint debates, recitations and amateur theatricals—something really instructive and entertaining within a few easily-covered miles of the farmer for half the evenings of the winter. The Quakers of the northern township soon had a regular series of literary contests; the people of two villages got up very creditable musical societies, while the ‘young folks of Raccoon Valley’ capped the climax by taking the abandoned Bridgeton church, refitting it in semi-theatrical style and giving a fairly good season of the ‘legitimate drama.’

“Now it is quite the common thing for a popular lawyer or other professional from the county seat to ride out 10 or 12 miles after business hours, deliver a lecture to a crowded district school-house, and canter home by late bedtime. There has been a general ‘brightening up.’ The winter, once so gloomy to the isolated farmer, is now the season when he really lives. Another remarkable effect was to create a sort of furor for elegant turnouts. That

* Mr. J. H. Beadle.

“ county was long noted in the adjacent cities as the best market in
 “ the country for fine buggies and carriages, and at the county fair
 “ one may see hundreds of farmers’ families in vehicles so elegant as
 “ to attract attention and excite criticism, indeed, for a writer in one of
 “ the county papers lately alleged that ‘ the only trouble with the
 “ ‘ farmers is that they have been extravagant.’

“ The improvement in ‘ roadsters’ is remarkable. Now that a
 “ trotter is no longer liable to break his leg or his neck, indeed, on a
 “ country road, one can afford to put some money in him ; there are
 “ several noted stables in the county, and the ‘ Rockville track ’ ranks
 “ high in that racing circuit. These are a few of the many incidental
 “ advantages. No doubt some of these improvements would have
 “ come in time anyhow, but a very great deal must be credited to the
 “ five gravel roads.”

XVI.

In January, 1890, the New York semi-weekly *Tribune* published a communication from Mr. D. A. Barke, who stated that the town of Sweden, Monroe County, N. Y., then owned a stone crusher and hired men by the day to run it. In the spring of 1889 the town appropriated \$2,000 to crushed stone, and according to Mr. Barke’s estimate this sum was sufficient to furnish stone for 5 miles of perfect road. The stone was donated and the town paid for hauling and crushing, while the different road districts hauled the crushed stone from the pile and put it upon the roads where needed. Mr. Barke continues : “ I think that money thus expended goes ten times as far as any other in making highways. In the last three years the town of Sweden has made about 20 miles of road so good that a team can haul as large a load in this open muddy weather as in summer. The land is clay and the roads not laid with stone or gravel are simply fearful. It would pay a person to go a long distance to see what has been done to the roads in the town of Sweden. When the roads are all made with crushed stone and fences removed from the bleak places where snow drifts, the millennium will not be far away.”

Another thing ; you ought to have roads that you could be proud of. If there is any improvement in your town or county which makes it worth mentioning, you are bound to tell of it. You never saw an American town having good roads whose people did not know that their town was superior to yours ; they know the value of a good road

and they talk about it. I have been telling you what Mr. Nevins says about the Orange roads in New Jersey and what Mr. Beadle says about the improved roads in Parke County, Indiana. You see that they are both proud of the fact that they belong to progressive communities ; their children can go to school when yours cannot ; their wives and daughters can visit the neighbors, attend church, go to the village and get a little of the pleasures of life, while yours are shut up at home by the overwhelming bondage of bad roads. In spring and fall they are engaged in a continual warfare to keep the house clear of mud that is tracked in by everybody who steps outside the limits of the door-yard. The carpets become filled with grit which tends to wear them out in one-half the time they would otherwise last, and your clothing suffers in a similar way. In summer it is dust instead of mud, but in whatever time of year you take it, a dirt road is not only an intolerable expense to the farmer but an intolerable labor-making nuisance to the farmer's wife. Somehow it seems to be a common notion among farmers that a dirt road when dried by the summer sun and worn into fairly good condition by passing vehicles, is as good a wagon road as can be had for the purposes of farm traffic. This is a stupendous mistake. Every dirt road sinks more or less at the point of contact with the wheels of a heavy wagon. If the road is composed of soft material the depression is, of course, greater, but whether of soft gravel or clay it always exists in some degree. Many years ago an instrument was made, a kind of "spring balance" by which it could be ascertained exactly what power was necessary to haul a loaded wagon over roadways made of different kinds of materials. This instrument has been made in different forms and used on hundreds of different occasions, so that its results were proven to be of great value. It was found by these experiments that a horizontal force required to draw a wagon and load of 21 hundred weight over a "Telford" road was only 46 pounds, showing that the load was fifty-one times greater than a power required to haul it. To haul the same load upon a gravel road (laid on earth) required a power of 147 pounds or three time that found necessary on the Telford road. These results show that the hauling of loads upon gravel roads, which are commonly believed by the farmers to be as good as any, cost about three times as much as upon a well-made Telford road. The experiments which I am telling you about were somewhat extended, and their results were so interesting that they might well be studied by every person interested in the improvement of country roads.

XVII.

A bill was introduced one day in the Legislature at Albany to provide for the construction of improved roads in the State of New York. It was proposed that the main roads should be constructed and kept in repair by a general State tax; that a non-partisan commission should be appointed to supervise the laying out of these roads. Some of the opposition to that bill came from farmers who said they were opposed to having the public money spent by commission. It was a foolish objection. You will pardon me if I say that the farmer is not the only honest man in the world. No man has a monopoly of virtue. Every dollar of the thousands of millions collected by the United States Government, is collected by a public officer or a commissioner; every penny of the thousands of millions of dollars spent for government uses is spent by a public servant of some kind. Honesty is more popular than it used to be; there is less stealing in high places. Every administration for the last fifty years has improved upon the one which preceded it in the handling of public money. The population has been growing bigger; public methods have been systematized; the duties of public officers made more exacting and the number of defalcations is so small as to be hardly worth considering. The political parties are watching each other and are ever on the alert to find something wrong in each others camp.

It is right that the State Government should take care of the main roads just as the State Governments care for the main roads in other countries. Another thing, it is eminently right that the next generation should pay something toward the expense of constructing these roads. Your children and grandchildren will enjoy the benefits of these roads, and their property will be made valuable by their construction. Your State is practically out of debt and your public credit is excellent. You can borrow money at 3 per cent. on public credit and pay for it in twenty years if you like, or one-twentieth of it each year until the amount is paid. In the larger States the farmers portion of this burden will be exceedingly light. In the State of New York a careful estimate from statistics collected in all the counties shows that the farmers would be required to pay only about 7 per cent. of the entire cost, and that the other 93 per cent. would be paid by the incorporated cities and towns. Don't be frightened by every alarmist who screams "high taxes." Look well to your local tax and the State assessment will never give you trouble. You are paying less taxes than any other farmer in the world, and your op-

portunities are the grandest. Give yourself a chance to prosper and your taxes will become thin air. You have never really known what it is to be taxed. In 1820, when the best men of England were urging the adoption of better road laws and the building of better roads in that country, Sydney Smith wrote this sentence: "The school boy whips his taxed top; the beardless youth manages his taxed horse with a taxed bridle on a taxed road; and the dying Englishman, pouring his medicine, which has paid 7 per cent., into a spoon that has paid 15 per cent. flings himself back upon his chintz bed which has paid 22 per cent. and expires in the arms of an apothecary who has paid a license of a £100 for the privilege of putting him to death." England built her roads nevertheless. Think of that, and never again groan about taxes.

XVIII.

I think you will agree with me that your wagon roads should be much better than they are, and the main difficulty that troubles you, I believe, I can understand. You are wondering how you are to get the better roads which will give you the same advantages that are given to the farmers of England, France, Italy and other European countries.

The answer is not difficult. You are simply to insist that the main roads in your country shall be reconstructed and kept in repair at the expense of the State at large instead of by a tax directed against the farmers alone, and then you are to send a man to the Legislature who believes in the same doctrine and will stand up for it. Don't start again at the prospect of more taxes; you are not to pay more, but less. Did you ever take the trouble to find out what a ridiculously small portion of the State taxes you pay? It will do you no harm to look it up. Send a postal card to your Secretary of State at your State Capitol, and ask him to send you a copy of the last report, showing the State taxes collected in your State. Examine this book and compare it with your last tax receipt, and you will be amazed to find that the farmer cuts a comparatively small figure in making up these taxes. If you are good at figures, take out from the report which you receive the value of all the taxable property in the State. Then assume that, say \$10,000,000 were to be raised for the purpose of highway improvement; that this money should be raised by State loan payable in seventeen years; compute how much this would be for each year; divide the amount to be raised each year by the total value of all the taxable property in the State; this will give you the amount of tax on

each dollar of property. Then take the assessed value of your farm and you can easily decide what your proportion will be of that yearly tax. If you find that it costs you more than ten cents per acre of your entire farm, I shall be wonderfully in error. Now compare the amount of that tax with the time that you spend each year with your team "working out" your highway tax under the present system, and tell me which you think is the cheaper.

Consider the loss of time and energy, and the expenses of repairs and labor which the old road puts upon you. How much has your farm increased in value in the last ten years? Not one dollar. Think of this, and, if you can't do better, coax your neighbors into the desperate experiment of putting down half a mile of good solid smooth road, just to satisfy yourselves by a home-made object lesson.

Experience will convince you one way or the other, and if you find that after all good roads are a splendid investment, nail your conviction into the platform of your political party and fight hard for that policy which best tends to develop and enrich the country—keep thinking. "Second thoughts are the adopted children of experience."

XIX.

And so I have tried to show you that to have a good road is to save, to accumulate, to improve and prosper; for prodigality and waste are everywhere abroad, and there is no prodigal like a shiftless community. And I have written to you about the common roads, for it is high time that you should know that these roads are the most expensive of all the public property, and that for about a hundred years in the keeping of these roads you have been paying a good deal more than your share of the expense. The politicians have been making ducks and drakes of your resources at the rate of a thousand millions or so a year, and have stuck to the political dogma that anything is good enough for the farmer so long as his wits can be confined to the business of raising crops.

It will pay you to think of this from time to time, because it all comes down to a question between the farmer and the State, and if you bear in mind that the seven holes in your head were all made to use, you are likely to discover a big balance to your credit in the public accounts. Of course the "accounts" are more or less imaginary, but the balance is not; and I may as well say right here that as soon as you are satisfied that the day has come when the State should begin to square its everlasting debt with the farmer, you had better strike an

attitude and extend your hand for a settlement just after the manner of that despot down at the toll-gate who plucks your dime every time he accords you the privilege of traveling the public road.

Bear in mind, too, that the common highway is the property of all the people ; that the road which passes your door yard is only part of the great highway from Maine to California ; for I have tried to show you how it is that every other civilized nation on the face of the globe has repented its shamefaced imposition upon the farmer, and has made the care and keeping of the main country roads a direct charge upon the Government itself. They have found it to be immensely better for the Government, immeasurably better for the farmer, and more equitable for both. One of these days we are going to do things on the same plan in the United States, and it only rests with you to fix the time. You may hope to catch larks if ever the Heavens fall, but you'll get no help from the politicians unless you stand up on both feet and ask for it.

Besides, your average politician is not often " posted " on the question of good roads. Try him and see. Next November, about election time, when the fall rains have set in and your dirt roads have gone into their semi-annual pickle, candidates for the Legislature will appear in your neighborhood and you will find the man whose hand is like a dead porgie for nine months in the year to be the most genial fellow living. Go down to the corners and hear him make a speech. He feels an agony of apprehension that the State is not going to do the square thing by the farmer, and he has just wallowed through twelve miles of mud to talk to you about ballot reform and the tariff on tomato cans. His poor horse is half dead with fatigue, and his buggy is pasted and clogged all over with thick mud till every spoke is as big as the leg of a piano. Ask him what he thinks of the country roads ; and whether it isn't about time for the State to take the lead in a movement to improve the main highways. Tell him that in your State bad roads on election day mean the practical disfranchisement of twenty thousand intelligent farmers, and ask him if he doesn't see how perilous it is to leave the success or failure of the stupendous tomato can question dependent on the weather.

Suggest to him that it will be time enough to settle the best way to count the ballots when a way has been provided for every voter to cast one; that a bad road is a tax on your citizenship; that every general election day sees half a million of the best farmers of this country mud-bound at home and deprived of their votes because they can't get to the polls, and ask him to extend his ballot reform movement so

as to cover the entire question. It is just as important to get the ballots fully into the box as to get them fairly out of it. Every citizen should not only have the privilege of voting, but the public hand in this free republic should make every road good enough to invite all its voters to the polls on election day. When you compel a farmer to drive through 10 miles of mortar bed to cast a loyal vote you are making him pay for the privilege, and the State which does that in this advanced year of grace is guilty of a wrong.



Say all this to your political candidate. Tell him the people of this country are paying \$140,000,000 every year to support the common schools; that about \$45,000,000 of this sum are wasted because more than 30 per cent. of the pupils are kept out of school—mostly on account of bad roads and bad weather; that the farmers are bearing the greatest proportion of this loss and that a few miles of better roads in each county would tend to even up matters a little.

You are likely to find him bristling all over with a sedate and childish ignorance of these questions. He is fenced in by a party platform, a political handbook and a boss; but a little common sense from the home-market will do him no harm, and he will serve your interests just in proportion that you make him see that the farmer has no use for a narrow-gauge politician.

But your representatives in the law-making bodies of the State and nation will be found to include many able and far-seeing men who are ready to urge the movement for better roads as soon as they are

sure of the moral support of the farmer. They know well the crying need of this improvement, but they are not sure that you know it. They will pass the laws as quickly as you demand them; but as representatives they generally aim to reflect the popular will rather than to mould it. Few men in public office have the courage to lead.

In the departments of government at Washington the necessity for better roads is an accepted fact. The Department of State has lately received from our consuls and ministers representing the United States in foreign ports, a most interesting series of statements and descriptions respecting the improved systems of roads and road laws of other countries, and these reports are now being prepared by the Government printer for distribution. In the year 1888 the report of the Department of Agriculture contained a statement by the Commissioner so timely and so forcible that I have deemed best to quote it for your benefit.

The Commissioner says :

“The common roads of the country are the veins and arteries through which flow the agricultural productions and the commercial supplies, which are the life-blood of the nation, to those great ducts of travel and transportation—the railroads of the country.

“While our railway system has become the most perfect in the world, *the common roads of the United States have been neglected and are inferior to those of any other civilized country in the world.* They are deficient in every necessary qualification that is an attribute to a good road; in direction, in slope, in shape and service, and, most of all, in want of repair. These deficiencies have resulted not only from an ignorance of the true principles of road-making, but also from the varied systems of road-building in force in the several States of the Union, due to defective legislation. *The principle upon which the several States have based much of their road legislation is known as the ‘road-tax’ system of personal service and commutation, which is unsound as a principle, unjust in its operations, wasteful in its practice, and unsatisfactory in its results. It is a relic of feudalism borrowed from the ‘statute labor’ of England, and its evil results are to-day apparent in the neglected and ill-conditioned common roads of the country.*

“It is a question of vast importance to the welfare of this nation that these arteries of agricultural and commercial life should receive the attention that their importance deserves, and that an effort should be made to remedy the defects now existing and establish a system that could be made uniform and efficient in all the States of the Union.



“ By the improvement of these common roads every branch of our
 “ agricultural, commercial and manufacturing industries would be
 “ materially benefited. Every article brought to market would be
 “ diminished in price ; the number of horses necessary as a motive
 “ power would be reduced, and by these and other retrenchments
 “ millions of dollars would be annually saved to the public. The ex-
 “ pense of repairing roads and the wear and tear of vehicles and horses
 “ would be essentially diminished, and the thousands of acres of land
 “ the products of which are now wasted in feeding unnecessary animals
 “ in order to carry on this character of transportation would be de-
 “ voted to the production of food for the inhabitants of the country.
 “ In fact, the public and private advantages which would result from
 “ effecting this great object in the improvement of our highways are
 “ incalculable, not only to the agricultural community as a class, but
 “ to the whole population as a nation.”

Gladstone, who is perhaps the greatest Englishman of the century, says : “ The duties of a government are paternal,” and in that sentence includes the whole scheme of honest state-craft. It is this principle that pervades the road laws of every civilized country in Europe and insures to all the people a fair and equitable opportunity to enjoy, untrammelled, the full blessings of their vocations and live their lives “ in the pursuit of happiness.”

What “ paternal duty,” my dear American farmer, does your State exercise in your behalf? Post offices? Yes, it leaves your letter at the corners, four miles distant and permits you to wade and wallow for it. Free suffrage? Yes, my loyal friend, every year or two the election excitement gets into your borough and you are invited once or twice a week to shoulder a torch and chase the village band through miles of slime to the tune of “ Kemo Kimo ” till election day comes, when, if your rheumatism lets up and the mud isn't too deep, you drive the patient old mare through miles of mangled soil to help elect somebody who is apt to serve your interests last and least of all. Schools? Yes, the red school-house is there, but your children are half the time at home in spring and fall because the roads are bad. Churches? No, your Government leaves the religious question entirely with you, and I sometimes think when the old clergyman preaches the doctrine, “ A righteous man regardeth the life of his beast,” and “ The prudent man looketh well to his going,” that there is enough philosophy in those two texts to give you the first good lift to stronger ground.

You see, it is a kind of reform that must come from the people,



and, most of all, from the farmers. It is a reform that benefits all and injures none ; makes you broader and better in your person and in your possessions ; helps and hastens the happiness of your family ; shields and saves the patient friend that drags your wagon so many miles from year to year ; puts you on better terms with yourself and all mankind and leaves you wondering what sort of a farmer that was who lived and labored in a sea of mire. It is a reform that is now at the threshold of your State and one that will respond to your feeblest invitation.

I. B. P.

AREA AND VALUE OF FARMS.

The area and value of farms for 1890 can only be inferred from the figures of the census of 1880, by comparison with the acreage employed in the cultivation of the principal crops. These comparisons, given below, show that the increase in acres thus employed has been, during the past ten years, 27.1 per cent. The acreage improved in 1880 was 284,771,041, and assuming that the increase has been substantially the same, the total of improved acreage in farms should now be about 361,940,000, and the total acreage in farms 681,300,000, against 536,081,835 in 1880. No estimate of value can be made, since changes in the value of farm lands have not been officially reported for some years.

The acreage in the principal crops, as given in the agricultural reports for 1889, with such estimates as are warranted by the monthly reports for 1890, are as follows:

| | 1880. | 1890. (Estimated.) | 1880. | 1890. (Estimated.) |
|-------------|------------|-----------------------|----------------|-----------------------|
| Corn..... | 78,319,651 | 78,867,000 | Rye..... | 2,364,805 |
| Wheat..... | 38,123,859 | 36,373,000 | Buckwheat..... | 912,630 |
| Oats..... | 27,462,316 | 27,105,000 | | |
| Barley..... | 2,996,382 | 2,939,000 | Total..... | 150,179,643 |
| | | | | 148,626,000 |

To these must be added tobacco, potatoes, hay and cotton, of which the latest estimates given by the Department are for 1888. Reckoning these, with such changes as have been reported, the aggregate of acreage in all the above crops for 1890 would be about 204,457,100. In 1880 the acreage in all these crops was 164,710,567, thus showing an increase of 27.1 per cent. during the ten years.

The yield of the principal products, estimated from the monthly returns, may be roughly stated thus: Corn, 1,569,000,000 bushels; wheat, 403,750,000 bushels; oats, 637,000,000 bushels; barley, 61,710,000 bushels; rye, 26,084,000 bushels; buckwheat, 13,233,000 bushels; tobacco, 536,600,000 pounds; potatoes, 140,000,000 bushels; hay, 46,300,000 tons, and cotton, about, 7,800,000 bales. These show actual losses in several of the most important crops, in comparison with the yield ten years ago, on account of the partial failure of those crops this year.

LIVE STOCK ON FARMS.

The number and value of animals on farms, as shown by the Department of Agriculture for January 1, 1880, and January 1, 1890, compare as follows:

| | Number. 1880. | Number. 1890. | Value. 1880. | Value. 1890. |
|-----------------|------------------|------------------|-----------------|-----------------|
| Horses..... | 11,201,800 | 14,213,837 | \$613,206,611 | \$978,516,562 |
| Mules..... | 1,725,500 | 2,331,027 | 105,048,319 | 182,394,099 |
| Milch cows..... | 12,027,000 | 15,952,883 | 279,899,420 | 353,152,133 |
| Cattle..... | 21,231,000 | 36,849,024 | 341,761,154 | 560,625,137 |
| Sheep..... | 40,765,900 | 44,336,072 | 90,230,100 | 100,659,761 |
| Hogs..... | 34,034,100 | 51,602,780 | 145,781,515 | 243,418,336 |
| Total..... | | | \$1,576,917,119 | \$2,418,766,028 |

The values are calculated upon prices reported by the Department for each of the States. The following shows the average prices on farms at the two dates:

| | 1880. | 1890. | 1880. | 1890. |
|-------------|---------|---------|-------------|---------|
| Horses..... | \$54 75 | \$68 84 | Cattle..... | \$16 10 |
| Mules..... | 61 26 | 78 25 | Sheep..... | 2 21 |
| Cows..... | 23 27 | 22 14 | Swine..... | 4 28 |
| | | | | 4 72 |

No information is officially reported regarding the number of poultry or the production of eggs. All estimates on the subject are exceedingly loose. According to the latest official estimates, the yield of wool for 1890 is not far from 270,000,000 pounds.

GROWTH OF THE SOUTHERN STATES.

| | For year ending June 30, 1890. | | For year 1890. | Per cent. |
|-------------------------------------|-----------------------------------|---------------|-----------------|------------|
| Total population..... | 17,556,920 | 11,361,993 | 14,638,936 | Inc. 19.9 |
| Whites..... | 6,194,924 | 5,631,749 | 9,007,187 | Inc. 26.2 |
| Colored..... | \$3,844,057,164 | 96,460,126 | 5,631,749 | Inc. 10.0 |
| Assessed wealth..... | 183,772,353 | 26,533,260 | \$2,164,155,795 | Inc. 19.9 |
| State debts (net)..... | 171,690,670 | 2,339,170,000 | 118,195,252 | Dec. 18.4 |
| State public indebtedness..... | 171,690,670 | 2,339,170,000 | 189,345,464 | Dec. 3.0 |
| Total State revenues..... | 2,339,170,000 | 41,118 | 13,249,866 | Inc. 100.0 |
| Banking capital..... | 2,339,170,000 | 41,118 | 92,575,000 | Inc. 86.1 |
| Capital invested during decade..... | 41,118 | 19,572 | | |
| Railroad mileage..... | \$1,301,696,740 | \$612,000,000 | | Inc. 110.1 |
| Cost of railroad equipment..... | 56,714 | 34,563 | | Inc. 110.9 |
| Number of manufactories..... | \$551,483,900 | \$170,366,230 | | Inc. 64.2 |
| Capital..... | 742,865,200 | 315,924,794 | | Inc. 207.0 |
| Value of product..... | | | | Inc. 135.2 |

**NUMBER OF HORSES, MULES, OXEN, ETC., ON THE FARMS OF EACH
STATE AND TERRITORY IN THE YEAR 1890**

| States and Territories. | Horses. | | Mules. | | Oxen and other Cattle. | |
|--------------------------------|-------------------|--------------------|------------------|--------------------|------------------------|--------------------|
| | Number. | Value. | Number. | Value. | Number. | Value. |
| Connecticut..... | 51,376 | \$5,343,490 | ..... | ..... | 102,143 | \$2,778,071 |
| Maine..... | 99,657 | 9,388,168 | ..... | ..... | 157,386 | 3,739,024 |
| Massachusetts..... | 63,838 | 6,678,327 | ..... | ..... | 98,774 | 2,492,663 |
| New Hampshire..... | 52,402 | 4,662,079 | ..... | ..... | 116,169 | 2,772,447 |
| Rhode Island..... | 10,258 | 1,110,325 | ..... | ..... | 12,194 | 332,257 |
| Vermont..... | 84,353 | 6,718,276 | ..... | ..... | 160,053 | 3,834,563 |
| New England States.. | 361,884 | 33,900,665 | ..... | ..... | 655,719 | 15,949,025 |
| Delaware..... | 23,000 | 2,103,580 | 4,184 | \$462,269 | 26,866 | 665,614 |
| Maryland..... | 130,303 | 9,654,144 | 13,761 | 1,419,846 | 127,335 | 2,358,908 |
| New Jersey..... | 96,294 | 9,931,703 | 9,501 | 1,091,214 | 67,856 | 1,962,417 |
| New York..... | 673,950 | 64,834,410 | 5,288 | 537,577 | 783,634 | 22,034,214 |
| Pennsylvania..... | 666,031 | 56,973,887 | 24,021 | 2,502,471 | 852,267 | 20,175,387 |
| West Virginia..... | 146,647 | 9,638,581 | 6,867 | 514,411 | 286,538 | 5,150,882 |
| Middle States..... | 1,677,125 | 153,136,315 | 63,622 | 6,527,788 | 2,144,496 | 52,353,422 |
| Alabama..... | 134,805 | 9,740,488 | 143,258 | 12,456,013 | 454,042 | 4,060,682 |
| Georgia..... | 115,629 | 9,582,125 | 155,700 | 15,119,264 | 580,816 | 6,408,205 |
| Florida..... | 34,737 | 2,741,986 | 13,000 | 1,255,604 | 565,221 | 5,016,334 |
| Kentucky..... | 390,577 | 28,474,801 | 155,828 | 11,712,018 | 523,728 | 9,263,546 |
| Louisiana..... | 124,650 | 6,461,356 | 94,785 | 8,098,679 | 295,731 | 2,884,941 |
| Mississippi..... | 139,468 | 9,198,458 | 196,436 | 17,008,569 | 441,862 | 4,120,698 |
| North Carolina..... | 154,229 | 11,347,404 | 96,295 | 7,881,118 | 398,414 | 4,170,321 |
| South Carolina..... | 70,303 | 6,180,143 | 79,269 | 7,664,256 | 210,396 | 2,767,004 |
| Tennessee..... | 303,206 | 21,452,283 | 229,246 | 16,327,002 | 484,578 | 5,660,645 |
| Virginia..... | 293,317 | 18,172,031 | 30,083 | 3,116,584 | 419,523 | 6,569,393 |
| Southern States..... | 1,726,921 | 123,351,135 | 1,999,930 | 100,620,997 | 4,374,291 | 50,927,269 |
| Arkansas..... | 187,153 | 10,612,675 | 129,866 | 9,042,968 | 587,212 | 5,072,101 |
| Colorado..... | 137,835 | 7,631,317 | 8,000 | 696,487 | 1,048,933 | 17,595,648 |
| Dakota..... | 296,555 | 20,667,317 | 16,682 | 1,496,401 | 822,017 | 12,980,555 |
| Idaho..... | 137,865 | 5,790,330 | 1,704 | 98,832 | 374,247 | 6,175,076 |
| Illinois..... | 1,123,973 | 83,301,912 | 109,947 | 8,668,039 | 1,713,966 | 32,076,531 |
| Indiana..... | 667,577 | 52,677,062 | 53,827 | 4,310,109 | 957,843 | 18,027,577 |
| Iowa..... | 1,095,300 | 79,626,009 | 42,316 | 3,341,005 | 2,577,161 | 46,475,399 |
| Kansas..... | 726,318 | 46,117,430 | 94,714 | 7,195,907 | 1,820,422 | 30,563,067 |
| Michigan..... | 477,407 | 40,206,792 | 6,095 | 597,477 | 547,716 | 11,710,832 |
| Minnesota..... | 304,783 | 30,761,148 | 11,412 | 1,010,023 | 617,256 | 10,188,617 |
| Missouri..... | 789,769 | 47,189,413 | 230,097 | 15,597,676 | 1,515,935 | 24,221,922 |
| Montana..... | 216,495 | 8,989,946 | 2,450 | 135,316 | 981,786 | 16,925,993 |
| Nebraska..... | 522,036 | 37,787,194 | 45,792 | 4,040,759 | 1,306,372 | 22,242,548 |
| New Mexico..... | 52,350 | 1,552,854 | 10,263 | 409,282 | 1,383,357 | 15,560,693 |
| Ohio..... | 771,607 | 62,570,402 | 24,472 | 2,153,409 | 986,601 | 22,317,518 |
| Texas..... | 1,350,344 | 44,527,176 | 213,146 | 11,343,579 | 7,167,853 | 63,294,293 |
| Utah..... | 139,399 | 4,838,522 | 4,055 | 178,842 | 426,170 | 5,999,615 |
| Wisconsin..... | 437,820 | 33,673,249 | 7,066 | 610,681 | 805,170 | 13,772,432 |
| Wyoming..... | 141,570 | 5,556,097 | 2,880 | 209,884 | 1,217,890 | 18,240,047 |
| Western States and Ter. | 9,686,156 | 624,076,845 | 1,014,784 | 71,226,686 | 26,866,907 | 393,422,264 |
| Arizona..... | 32,670 | 1,519,155 | 2,936 | 205,520 | 604,170 | 9,062,450 |
| California..... | 372,084 | 23,664,984 | 42,803 | 3,347,496 | 697,805 | 11,719,707 |
| Nevada..... | 51,523 | 2,849,279 | 2,369 | 159,585 | 373,527 | 5,426,224 |
| Oregon..... | 186,841 | 8,480,719 | 3,315 | 197,058 | 762,728 | 13,070,341 |
| Washington..... | 118,633 | 7,537,475 | 1,268 | 108,069 | 360,381 | 8,684,635 |
| Pacific States..... | 761,751 | 44,051,612 | 25,691 | 4,018,628 | 2,807,611 | 47,972,457 |
| Total..... | 14,213,837 | 978,516,562 | 2,331,027 | 182,394,099 | 36,849,024 | 500,625,137 |

RAINFALL AND TEMPERATURE IN THE UNITED STATES.

PREPARED FROM NATIONAL WEATHER BUREAU DATA.

| Stations in States and Territories. | Mean annual rainfall (including snow melted), inches. | Mean annual temperature. | Highest recorded temperature in State. | Lowest recorded temperature in the State. | Stations in States and Territories. | Mean annual rainfall (including snow melted), inches. | Mean annual temperature. | Highest recorded temperature in State. | Lowest recorded temperature in the State. |
|-------------------------------------|---|--------------------------|--|---|-------------------------------------|---|--------------------------|--|---|
| Alaska—Sitka | 701.00 | 44.0 | 79 | *4 | Mont.—Ft. Assiniboine. | 16.32 | 40.3 | | |
| Alabama—Mobile | 64.01 | 67.5 | | | Fort Custer | 13.64 | 45.0 | | |
| Montgomery | 53.77 | 65.0 | 107 | 4 | Helena | 13.80 | 43.0 | 111 | -63 |
| Fort Grant | 16.77 | 60.7 | | | Nebraska—Omaha | 35.10 | 49.6 | | |
| Ari—Whipple Bar'ks .. | 16.09 | 52.5 | | | North Platte | 19.11 | 48.9 | | |
| Yuma | 2.92 | 71.0 | 119 | -18 | Valentine | 18.01 | 45.0 | 107 | -35 |
| Arkansas—Little Rock. | 53.47 | 62.4 | | | Nevada—Winnemucca .. | 8.92 | 49.7 | 104 | -49 |
| Fort Smith | 42.31 | 60.6 | 107 | -7 | N. H.—Mt. Washington | 90.00 | 26.3 | 74 | -89 |
| California—Red Bluff .. | 25.73 | 62.1 | | | Manchester | 40.00 | 48.5 | 94 | -11 |
| San Francisco | 23.40 | 56.7 | | | N. J.—Atlantic City | 42.75 | 52.4 | 101 | -10 |
| San Diego | 10.85 | 60.8 | 112 | †-26 | New Mex.—Santa Fe | 13.94 | 48.8 | | |
| Colorado—Denver | 14.58 | 49.8 | | | Fort Stanton | 17.72 | 49.8 | 115 | -18 |
| Montrose | 7.20 | 48.2 | | | N. Y.—New York | 44.37 | 52.0 | | |
| Pike's Peak | 29.07 | 18.8 | 105 | ‡-37 | Albany | 38.14 | 49.0 | | |
| Conn.—New Haven | 49.70 | 49.0 | 100 | -14 | Buffalo | 37.76 | 46.2 | 100 | -23 |
| Delaware—Breakwater. | 32.62 | 54.0 | 98 | † | N. C.—Charlotte | 55.24 | 60.3 | | |
| Dis. Col.—Washington. | 43.81 | 54.7 | 104 | -14 | Hatteras | 70.00 | 61.4 | 107 | -5 |
| Florida—Jacksonville .. | 56.92 | 66.9 | | | N. Dakota—Ft. Buford. | 13.37 | 39.8 | | |
| Key West | 39.17 | 74.1 | | | Bismarck | 18.57 | 39.5 | 107 | -49 |
| Pensacola | 64.86 | 68.1 | 104 | 15 | Ohio—Cincinnati | 41.54 | 55.5 | | |
| Georgia—Atlanta | 56.07 | 61.1 | | | Columbus | 40.41 | 52.2 | | |
| Savannah | 52.50 | 65.6 | 105 | -2 | Cleveland | 37.08 | 48.6 | 104 | -28 |
| Idaho—Boise City | 13.47 | 50.6 | 115 | -38 | Oregon—Portland | 50.89 | 53.0 | | |
| Illinois—Cairo | 43.90 | 57.7 | | | Umatilla | 9.70 | 52.5 | 110 | -39 |
| Chicago | 36.24 | 48.7 | 103 | -23 | Penn.—Erie | 42.40 | 48.9 | | |
| Indiana—Indianapolis .. | 43.00 | 52.3 | 101 | -25 | Pittsburg | 37.32 | 53.3 | | |
| Iowa—Dubuque | 38.18 | 47.4 | | | Philadelphia | 40.63 | 54.1 | 103 | -16 |
| Keokuk | 36.63 | 51.5 | | | R. I.—Newport | 49.97 | 50.0 | | |
| Des Moines | 37.50 | 48.9 | 104 | -32 | Block Island | 48.19 | 49.5 | 92 | -9 |
| Kansas—Leavenworth .. | 38.63 | 53.5 | | | S. C.—Charleston | 57.60 | 66.3 | 104 | -11 |
| Dodge City | 20.92 | 53.1 | | | S. Dakota—Fort Sully .. | 15.81 | 41.0 | | |
| Concordia | 25.60 | 51.5 | 108 | -20 | Huron | 22.98 | 43.0 | | |
| Kentucky—Louisville .. | 47.07 | 57.3 | 105 | -20 | Yankton | 27.84 | 46.2 | 111 | -39 |
| Louisiana—Shreveport .. | 52.54 | 66.4 | | | Tenn.—Nashville | 52.01 | 59.3 | | |
| New Orleans | 64.89 | 69.5 | 107 | 1 | Knoxville | 53.68 | 58.4 | 104 | -16 |
| Maine—Eastport | 50.64 | 45.4 | | | Texas—Palestine | 45.21 | 65.6 | | |
| Portland | 42.15 | 46.6 | 97 | -21 | Brownsville | 37.03 | 72.8 | | |
| Maryland—Baltimore .. | 43.16 | 55.6 | 102 | -6 | Fort Eliot | 24.53 | 54.8 | | |
| Mass.—Boston | 46.82 | 48.8 | | | El Paso | 11.06 | 64.0 | 113 | -14 |
| Wood's Holl | 44.11 | | | | Utah—Salt Lake City .. | 26.68 | 51.1 | 104 | -20 |
| Springfield | 47.04 | 49.6 | 102 | -13 | Vermont—Burlington .. | 28.76 | 45.1 | 97 | -32 |
| Michigan—Marquette .. | 32.74 | 39.8 | | | Virginia—Norfolk | 51.37 | 59.5 | | |
| Alpena | 37.37 | 40.7 | | | Lynchburg | 43.57 | 57.3 | 103 | -5 |
| Detroit | 33.31 | 49.0 | 101 | -33 | Wash.—Walla Walla | 16.74 | 52.5 | | |
| Minnesota—Duluth | 32.52 | 38.6 | | | Olympia | 53.75 | 40.8 | | |
| St. Vincent | 16.67 | 33.4 | | | Tatoosh I'd | 92.00 | 48.6 | 104 | -31 |
| St. Paul | 28.47 | 44.0 | | | W. Va.—Morgantown .. | 46.91 | 53.8 | 97 | -10 |
| Moorhead | 25.61 | 37.0 | 103 | -54 | Wis.—Green Bay | 32.02 | 43.5 | | |
| Mississippi—Vicksburg .. | 58.75 | 66.0 | 101 | 3 | Milwaukee | 32.81 | 45.1 | | |
| Missouri—St. Louis | 38.70 | 56.3 | | | La Crosse | 32.33 | 46.0 | 101 | -42 |
| Lamar | 37.37 | 54.4 | 106 | -22 | Wyoming—Cheyenne .. | 11.60 | 44.9 | 151 | -54 |

* Lowest for Sitka; Fort St. Michael's, -52.

† Lowest at Fort Bidwell; San Francisco, 34.

‡ Pike's Peak minimum; Denver, -29.

STATISTICS OF CITIES IN THE UNITED STATES.

| CITIES. | ACTUAL PROPERTY VALUATION. | | Tax Rate per \$100.† |
|-----------------------------|----------------------------|-------------|-------------------------|
| | Real. | Personal. | |
| Albany, N. Y..... | \$63,380,046 | \$6,282,525 | \$1.90 |
| Allegheny, Pa..... | 80,000,000 | 1,300,000 | 1.50 |
| Atlanta, Ga..... | 78,000,000 | 20,000,000 | 1.50 |
| Augusta, Ga..... | †15,717,000 | †5,241,000 | 1.25 |
| Austin, Tex..... | 12,524,018 | 4,946,686 | 1.65 |
| Baltimore, Md..... | 209,000,000 | 65,000,000 | 1.85 |
| Bay City, Mich..... | 10,550,000 | 4,400,000 | 1.64 |
| Binghamton, N. Y..... | †16,105,448 | †2,040,798 | 1.95 |
| Birmingham, Ala..... | 16,000,000 | 1,000,000 | 0.50 |
| Bloomington, Ill..... | 10,111,272 | 3,392,864 | 2.30 |
| Boston, Mass..... | 619,985,400 | 202,040,700 | 1.33 |
| Bridgeport, Ct..... | *50,000,000 | ..... | 2.45 |
| Brooklyn, N. Y..... | 430,911,794 | 21,846,807 | 2.56 |
| Buffalo, N. Y..... | 151,356,265 | 11,003,125 | 1.46 |
| Burlington, Ia..... | 13,000,000 | 2,000,000 | 5.48 |
| Cambridge, Mass..... | 52,235,000 | 15,339,925 | 1.56 |
| Camden, N. J..... | 18,342,050 | 1,091,795 | 2.48 |
| Charleston, S. C..... | 25,000,000 | 3,200,000 | 2.30 |
| Chattanooga, Tenn..... | 36,000,000 | 4,000,000 | 1.80 |
| Chelsea, Mass..... | 18,187,500 | 2,607,629 | 1.76 |
| Chicago, Ill..... | 170,553,854 | 48,800,514 | 4.35 |
| Cincinnati, O..... | †134,872,270 | †39,964,970 | 2.68 |
| Cleveland, O..... | *135,000,000 | ..... | 2.90 |
| Cohoes, N. Y..... | 9,989,195 | 658,212 | 1.05 |
| Columbus, O..... | †31,000,000 | †12,000,000 | 2.40 |
| Council Bluffs, Ia..... | 25,000,000 | 7,000,000 | 2.00 |
| Covington, Ky..... | 16,650,000 | ..... | 1.92 |
| Dallas, Tex..... | 30,000,000 | 10,000,000 | 1.50 |
| Davenport, Ia..... | 18,000,000 | 6,000,000 | 1.60 |
| Dayton, O..... | †20,000,000 | †10,000,000 | 2.24 |
| Denver, Col..... | 153,700,000 | 33,750,000 | 1.00 |
| Des Moines, Ia..... | *†1,922,180 | ..... | 2.51 |
| Detroit, Mich..... | 123,397,610 | 38,436,960 | 1.57 |
| Dubuque, Ia..... | 25,000,000 | 15,000,000 | 1.25 |
| Duluth, Minn..... | 100,000,000 | 15,000,000 | 2.48 |
| Eau Claire, Wis..... | 7,000,000 | 5,000,000 | 2.68 |
| Elizabeth, N. J..... | 12,580,925 | 1,495,345 | 2.98 |
| Elmira, N. Y..... | 13,163,139 | 1,701,348 | 1.41 |
| Erie, Pa..... | *15,214,000 | ..... | 1.65 |
| Evansville, Ind..... | 15,288,746 | 6,942,995 | 1.50 |
| Fall River, Mass..... | 32,459,650 | 21,013,533 | 1.64 |
| Fort Wayne, Ind..... | 22,000,000 | 8,000,000 | 1.10 |
| Galveston, Tex..... | 23,956,400 | 20,251,596 | 1.70 |
| Grand Rapids, Mich..... | 75,000,000 | 25,000,000 | 3.00 |
| Harrisburg, Pa..... | 20,800,000 | ..... | 0.50 |
| Hartford, Ct..... | 30,299,539 | 16,139,966 | 1.00 |
| Haverhill, Mass..... | 17,000,000 | 5,000,000 | 1.70 |
| Huboken, N. J..... | 17,275,600 | 1,622,862 | 2.47 |
| Holyoke, Mass..... | 16,014,870 | 5,158,955 | 1.60 |
| Indianapolis, Ind..... | 37,374,315 | 15,885,430 | 1.90 |
| Jackson, Mich..... | 5,533,345 | 1,503,695 | 2.55 |
| Jacksonville, Fla..... | 15,000,000 | 4,000,000 | 1.25 |
| Jersey City, N. J..... | 73,059,265 | 5,898,150 | 2.64 |
| Kalamazoo, Mich..... | ..... | ..... | 1.48 |
| Kansas City, Mo..... | 61,010,327 | 21,475,230 | 1.25 |
| Knoxville, Tenn..... | ..... | ..... | 1.25 |
| La Crosse, Wis..... | 11,820,756 | 1,884,563 | 2.00 |
| Lawrence, Mass..... | †22,297,625 | †8,178,598 | 1.48 |
| Leavenworth, Kan..... | 16,000,000 | 4,000,000 | 4.63 |
| Lexington, Ky..... | *13,500,000 | ..... | 1.20 |
| Lincoln, Neb..... | 25,000,000 | 15,000,000 | 4.00 |
| Little Rock, Ark..... | 8,000,000 | 3,500,000 | 2.40 |
| Long Island City, N. Y..... | †10,056,587 | †200,400 | 3.90 |
| Los Angeles, Cal..... | 88,864,000 | 9,778,000 | 1.20 |
| Louisville, Ky..... | 125,000,000 | 50,000,000 | 1.98 |
| Lowell, Mass..... | 45,316,150 | 17,037,462 | 1.70 |
| Lynn, Mass..... | 29,390,332 | 11,340,046 | 1.50 |

* Combined total valuation of real and personal property. † Assessed valuation. ‡ Tax on each \$100 of assessed valuation.

STATISTICS OF CITIES IN THE UNITED STATES.—Continued.

| CITIES. | ACTUAL PROPERTY VALUATION. | | Tax Rate per \$100.† |
|----------------------------|----------------------------|-------------|-------------------------|
| | Real. | Personal. | |
| Manchester, N. H..... | \$19,884,280 | \$4,206,320 | \$1.91 |
| Memphis, Tenn..... | 55,000,000 | 25,000,000 | 1.85 |
| Milwaukee, Wis..... | *105,455,000 | ..... | 1.75 |
| Minneapolis, Minn..... | 118,826,690 | 19,152,040 | 1.70 |
| Mobile, Ala..... | 25,000,000 | 15,000,000 | .60 |
| Montgomery, Ala..... | 8,899,748 | 4,676,985 | 1.12½ |
| Nashville, Tenn..... | 24,079,400 | 9,486,325 | 1.50 |
| Newark, N. J..... | 88,729,950 | 25,265,425 | 1.82 |
| New Bedford, Mass..... | *34,637,000 | ..... | 1.68 |
| New Brunswick, N. J..... | 17,900,000 | 12,150,000 | 2.46 |
| New Haven, Ct..... | 39,486,092 | 11,253,444 | 1.95 |
| New Orleans, La..... | 87,652,430 | 44,262,629 | 2.02 |
| Newport, R. I..... | 25,356,900 | 6,863,750 | 1.00 |
| Norfolk, Mass..... | 26,640,500 | 9,518,525 | 1.46 |
| New York City..... | 1,392,290,007 | 129,688,383 | 1.97 |
| Norfolk, Va..... | 12,685,245 | 1,968,480 | 1.80 |
| Omaha, Neb..... | *200,000,000 | ..... | 4.15 |
| Oshkosh, Wis..... | 10,000,000 | 5,500,000 | 2.25 |
| Paterson, N. J..... | 23,905,471 | 4,918,809 | 2.50 |
| Peoria, Ill..... | 16,604,600 | 11,732,560 | 5.60 |
| Petersburg, Va..... | 5,926,810 | 3,884,190 | 1.60 |
| Philadelphia, Pa..... | 1685,507,618 | 13,205,900 | 1.85 |
| Pittsburgh, Pa..... | *201,000,000 | ..... | 1.50 |
| Portland, Me..... | 23,184,400 | 12,427,590 | 1.97 |
| Portland, Ore..... | *15,250,000 | ..... | 1.00 |
| Poughkeepsie, N. Y..... | 9,718,890 | 3,813,850 | 2.40 |
| Providence, R. I..... | 1104,684,440 | 135,932,620 | 1.50 |
| Quincy, Ill..... | 16,500,000 | 3,000,000 | 1.00 |
| Reading, Pa..... | *45,000,000 | ..... | .95 |
| Richmond, Va..... | 35,763,639 | 17,707,704 | 1.40 |
| Rochester, N. Y..... | 188,049,075 | 15,935,700 | 1.52 |
| Rockford, Ill..... | 12,500,000 | 7,500,000 | 3.89 |
| Sacramento, Cal..... | 30,000,000 | 11,500,000 | 2.20 |
| Saginaw, Mich..... | 16,000,000 | 5,100,000 | 2.52 |
| Salem, Mass..... | 13,998,600 | 12,056,951 | 1.70 |
| Salt Lake City, Utah..... | ..... | ..... | ..... |
| San Antonio, Tex..... | 16,245,275 | 5,135,210 | 1.15 |
| San Diego, Cal..... | *55,000,000 | ..... | 1.00 |
| San Francisco, Cal..... | 234,672,468 | 66,243,938 | 1.61 |
| San José, Cal..... | 16,881,721 | 2,282,430 | 1.25 |
| Savannah, Ga..... | 18,500,000 | 11,000,000 | 1.50 |
| Schenectady, N. Y..... | 17,636,700 | 1567,970 | 1.65 |
| Scranton, Pa..... | 119,000,000 | 13,000,000 | 3.20 |
| Seattle, Wash..... | 22,745,975 | 3,598,070 | 1.00 |
| Sioux City, Ia..... | 50,000,000 | 10,000,000 | 2.85 |
| Somerville, Mass..... | 29,981,700 | 2,575,800 | 1.40 |
| Springfield, Ill..... | 13,000,000 | 5,000,000 | 5.00 |
| Springfield, Mass..... | 33,795,860 | 10,697,773 | 1.24 |
| Springfield, O..... | *16,580,104 | ..... | 2.10 |
| St. Joseph, Mo..... | 40,000,000 | 30,000,000 | 1.65 |
| St. Louis, Mo..... | 318,190,000 | 49,570,000 | 1.50 |
| St. Paul, Minn..... | 1106,000,000 | 119,000,000 | 1.00 |
| Syracuse, N. Y..... | 40,088,769 | 3,099,050 | 1.67 |
| Taunton, Mass..... | 14,000,000 | 9,000,000 | 1.78 |
| Terre Haute, Ind..... | 14,700,000 | 6,500,000 | 1.20 |
| Toledo, O..... | 23,718,070 | 9,423,310 | 2.90 |
| Topeka, Kan..... | 17,682,460 | 12,040,945 | § |
| Trenton, N. J..... | 20,199,162 | 6,981,643 | 1.75 |
| Troy, N. Y..... | 141,850,296 | 5,200,000 | 1.17 |
| Utica, N. Y..... | 16,461,052 | 2,330,606 | 1.69 |
| Washington, D. C. (a)..... | 41,493,154 | 11,699,250 | 1.50 |
| Wheeling, W. Va..... | *19,000,000 | ..... | .60 |
| Wilkesbarre, Pa..... | 4,688,831 | 50,000 | 5.10 |
| Williamsport, Pa..... | 7,955,723 | ..... | 1.80 |
| Wilmington, Del..... | *33,617,961 | ..... | 1.40 |
| Wilmington, N. C..... | 5,000,000 | 2,000,000 | 2.00 |
| Worcester, Mass..... | 57,810,194 | 15,607,809 | 1.56 |
| Yonkers, N. Y..... | 21,462,111 | 398,260 | 1.91 |

* Combined total valuation of real and personal property. † Assessed valuation. ‡ Tax on each \$100 of assessed valuation. § Under the laws of Kansas all property is assessed for taxation on a basis of 25 to 30 per cent.

(a) Statistics of the District of Columbia are given.

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