U. S. DEPARTMENT OF AGRICULTURE.

OFFICE OF PUBLIC ROAD INQUIRIES—BULLETIN NO. 25.

MARTIN DODGE, Director.

PROCEEDINGS

OF

THE JEFFERSON MEMORIAL AND INTERSTATE GOOD ROADS CONVENTION,

HELD AT

CHARLOTTESVILLE, VA., APRIL 2, 3, AND 4, 1902.

WASHINGTON:
GOVERNMENT PRINTING OFFICE.
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MONTICELLO, THE HOME AND TOMB OF THOMAS JEFFERSON.

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LETTER OF TRANSMITTAL.

U. S. Department of Agriculture,
Office of Public Road Inquiries,
Washington, D. C., December 20, 1902.

Sir: The Jefferson Memorial and Interstate Good Roads Convention, held at Charlottesville, Va., near the home and tomb of Thomas Jefferson at Monticello, on April 2, 3, and 4, 1902, was one of the greatest and most successful meetings ever held in this country for the consideration of highway improvement. Its national scope was shown by the fact that fifteen States were represented, including Maine, Oregon, and Florida. The convention was addressed by governors, members of Congress, generals of the U. S. Army, the Assistant Secretary of Agriculture, presidents of universities and of railway companies, and others.

I have the honor to transmit herewith the manuscript of the most important addresses delivered at the convention. These addresses brought out much valuable information relating to highway improvement which will be of interest throughout the United States, and I respectfully recommend that the same be published as bulletin No. 25 of this Office.

Very respectfully,

Martin Dodge,
Director.

Hon. James Wilson,
Secretary of Agriculture.

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PROCEEDINGS OF JEFFERSON MEMORIAL AND INTERSTATE GOOD ROADS CONVENTION AT CHARLOTTESVILLE, VA., APRIL 2–4, 1902.

INTRODUCTION.

In response to a request from the Office of Public Road Inquiries, Mr. R. E. Shaw, civil engineer in charge of the work, prepared in December, 1902, the following statement showing the origin, character, and progress of construction of the Jefferson Memorial road:

The idea of building an ideal highway to connect the city of Charlottesville with the home and tomb of Thomas Jefferson (Pl. I, frontispiece) originated with Hon. Martin Dodge, in a conversation some two years ago with certain citizens of Albemarle County, Va., who were earnest advocates of good roads. These gentlemen were much impressed with the vast amount of good which would accrue to their section with such a highway in daily use. Preliminary surveys were made in the early summer of 1901, and a petition for a relocation of the "Old Monticello road" was placed before the county authorities. Their action was very slow, and it was the middle of autumn before matters began to take definite shape, and the Jefferson Memorial Road Association was formed for the purpose of building this road as a memorial to the great American.

The organization was perfected with its present board of officers, Gen. Fitzhugh Lee being president, and prominent officials of the county, the city, and the University of Virginia serving as directors. Subscriptions were solicited and money enough was subscribed to start the work. Through the cooperation of the Office of Public Road Inquiries of the Department of Agriculture and the Southern Railway Company, the "good roads train," then touring the South, was listed to make the last stop of its schedule at Charlottesville, and arrangements were made for holding the Jefferson Memorial and Interstate Good Roads Convention.

When the visit of the train was arranged for there remained only five weeks in which to make preparations for the road work, which included the making of a 5-foot cut through rock within the city limits. The preliminary estimates were based on the use of convict labor, which had been promised at a cost of 25 cents to 30 cents per man per day; but the outbreak of smallpox among the convicts prevented this and we had to use the much more expensive free labor. On account of the scanty finances, it had first been planned to make the rock cut only the width of a single track, leaving it to be widened to the proper distance—i. e., 40 feet—when funds should be more plentiful. The gentlemen having charge of the good roads train, however, urged the desirability of having the memorial road the proper width, not in the country only, but also for the half mile of its length within the city limits, including this rock cut. It was, therefore, decided to risk the additional expense and give the road its proper width from its beginning at the Chesapeake and Ohio

Railway station. This made the cost very much larger than the preliminary estimate, as the following statement shows:

Preliminary estimate of cost.

Excavating, 1,200 cubic yards, at 20 cents	$240.00
Macadamizing	600.00
Tile and incidentals	100.00
Total cost	940.00

Actual cost.

Excavating, 5,391 cubic yards (largely rock), at 20.4 cents	$1,099.76
Cutting ditches (2,700 linear feet), draining springs, and tiling	199.40
Carpenter work, changing fences	80.23
Grubbing, clearing, and extra work	143.58
Macadamizing	600.00
Opening quarries and getting out stone, 960 cubic yards, at 90 cents	864.00
Hauling stone 2 miles, at 50 cents per yard	480.00
Engineer's pay	175.00
Total cost	3,641.97

The good roads train spent a week at Charlottesville and during that time the metal was laid upon about 1,000 feet of the road, which was a very satisfactory result, considering that about half of the time was lost on account of bad weather, rain, and snow. Owing to the numerous springs in this rock cut, the side ditches had to be carried down ahead of the main roadbed. The close proximity of the houses and the shallowness of the cut made blasting unsafe. About 18 inches of cobblestone (the result of 50 or perhaps 100 years of road mending) had to be removed from the old roadbed. All these conditions made the work tedious and expensive.

A good deal of earth excavation was done by the machinery of the good roads train on the first half mile beyond the city limits, and after the departure of the train, this work was carried on by the use of the county road machines, and plows and wheel scrapers, the teams and labor being contributed by the neighboring farmers, so that at present (December, 1902), in addition to the completion of the half mile within the city limits, the grading for a large part of the next mile has been finished, and the right of way has been paid for, the total expense to date being $4,570.

Two cuts are still to be completed—one about a mile, and the other about a mile and a half from town. These cuts can be completed at a cost of $1,000 to $1,200, and the roadbed will then be completed to the Moores Creek bridge. In the opinion of the engineer it would be a wise thing, when the work is resumed in the spring, to complete this grading and turn travel over the earth road before laying the metal, in order to develop the spongy spots in the red clay soil, and by the judicious use of the roller to obtain a perfect subgrade. The "box" for the metal being then cut out, the metal will be applied: A first course 6 inches in depth of 2½-inch stone rolled to 4 inches in thickness; then a 6-inch course of 1½-inch stone rolled to a thickness of 4 inches; and then 2 inches of fine stuff and screenings rolled and sprinkled to an inch in thickness, and with a properly hardened and uniform surface. (Pls. III and IV.)

The present bridge over Moores Creek is an old wooden structure of small span and only 2 feet above high water mark. It is hoped that this unsightly old structure may be replaced with a handsome memorial bridge, a stone arch, if possible.

From this point, leaving the old road, which ran for a quarter of a mile down the creek and then climbed the steep shoulders of the mountains, the relocation rises gradually along the sunny southern slopes of the hills, thus giving a series of beautiful views, escaping the sharp ascents of the foothills, and finally rejoining the old road high above the valley (fig. 1). From this point the road rises on easy grades and with gentle curves, while unfolding to the eye of the beholder a superb panorama of

many miles of rolling hill or winding valley, only bounded by the huge rampart of the Blue Ridge, which itself fades away into the dim distance of the far northern and southwestern horizon.

The relocation has been so made that the maximum grade is only 4 feet in 100, whereas the maximum grade of the old road was 16 feet in 100 (fig. 2).

Upon the highest reaches of the memorial road where it winds along the shoulder of the gorge, not far from the gateway of the Monticello estate, at the point where the moss-grown "spout spring" (Pl. II) leaps from the rocks at the roadside, it is the desire of the association to erect a memorial fountain of handsome and unique design to replace the wooden trough which is now—unless one fords the creek—the only place where horses can be watered for many miles along this mountain road, which has for a century been a highway of rough footing and hard pulling.

Preliminary estimates place the cost of completing the first section (one and a half miles from Charlottesville to Moores creek) at $5,000, and for the second mile and a half, owing to the rock encountered and the parapet walls to be built (fig. 3), at from $12,000 to $15,000, depending upon the amount of rock encountered.

If the association could raise sufficient funds to purchase its own crushing and metaling outfit, it would greatly reduce the cost of the work, besides assuring its being finished in a much better manner.

It is the desire of the association to make this memorial road not only a fitting monument to one of the wisest founders of the Republic, but also to have it one of the best pieces of object-lesson highway in the whole South. It can be done with a very slight effort if the admirers of Jefferson will unite in this purpose with the friends of good roads.

FIRST DAY—WEDNESDAY, APRIL 2, 1902.

The meeting was called to order by Gen. Fitzhugh Lee, first temporary and afterwards permanent chairman of the convention, and the proceedings were opened with prayer by Rev. Dr. Petrie, Charlottesville, Va.

OPENING ADDRESS.

By Gen. Fitzhugh Lee, *President Jefferson Memorial Road Association.*

The duty has devolved upon me not only to call this convention to order, but to explain briefly the objects for which we have assembled. Some months ago a few of our citizens conceived the idea of building a road from here to Monticello. The plan was adopted and an organization was effected. It had a twofold purpose: (1) To give the people of this section of Albemarle County and the city of Charlottesville a lesson in making good roads, and to show them the latest modern improvements in road-making machinery; and (2) to connect the home and tomb of Thomas Jefferson (Pl. I, frontispiece) and the University of Virginia (Pl. V) and Charlottesville with a splendid broad avenue, in which work we have now made a beginning.

Everybody recognizes the value of good roads; the farmers all know it; they know the great benefit that would accrue from being able to haul two tons to market where before they only hauled one.

They realize that the bills would be less for wagon repairs, and that the horses would go more miles without being shod. I don't think it is necessary to dwell upon the great value of public roads. We all know that; but the problem is how to secure the funds to build the roads. If you can get a large road fund and have it intelligently applied, you can build roads all over your county. There are a great many ways in which to raise that money. I think the time has come when the

National Government should make a great big annual appropriation for public roads in the various States of the Union [applause]; and this is one of the objects in getting these Senators and Representatives here to address us. They don't know much about making good roads; they couldn't throw stone into a stone crusher; they couldn't drive a wagon and distribute the stone, nor run a steam roller to compact it. But we want them interested in this subject of good roads so that when a bill is brought before Congress it can receive their support. If the National Government should make an appropriation of that sort there would probably be a certain amount of money to go to each State in the Union in proportion to its population, or in proportion to its desire to be helped in some way to build good roads. Then the State should regulate the amounts to go into the various counties, subject somewhat to the action of the counties themselves. A State, for instance, will receive a certain amount from the National Government to use in building roads. The State may then say to the counties: "If you want good roads and will raise a certain amount, a portion of this Government money will be set aside for you."

The United States appropriates now $20,000,000 a year to clean out the rivers and harbors of the country. I understand there is a bill before Congress to appropriate $60,000,000 this coming year. Now, I am told that nine-tenths of everything that goes either by rail or water transportation goes over the common roads first. Therefore, if you improve the roads, you begin at the foundation of prosperity for the people. The Government of the United States appropriates now a large sum every year for military purposes. It appropriates money for our mechanical and agricultural colleges. Now, inasmuch as good roads are the basis of prosperity both in country and city, why should not the Government appropriate an adequate sum of money annually for road improvement?

I know the great value of good roads. I knew it in war time. Without good roads I could not get away from the enemy quick enough, if I wanted to get away, and could not get up to them quick enough, if I wanted to get at them. [Laughter.] It is the same way in time of peace. Take your city of Charlottesville. Since I have had the honor to be one of your citizens, we have indeed had our share of bad roads. When you get onto one of these back streets, you feel that yourself, horse, and all are going down into the mud. Of course, it may be difficult to imagine that the streets of Charlottesville will sometime in the future all be nicely paved, that the roads leading into the city of Charlottesville will be nicely macadamized; but it is not difficult to imagine, if that should ever be accomplished, what magnificent results would ensue. Your storekeepers would have increased trade; your stables would derive a greater revenue; your professional men would have a greater amount of work to do, and everything would thrive in proportion.

Many of the States now are doing what they can without waiting for the National Government to make appropriations. The State of New York made an appropriation of some $50,000, I think, when they began the State aid work, and instead of finding it impracticable, they have increased it until they have five or six hundred thousand dollars; and some one told me yesterday there was a bill before the legislature of New York to appropriate $20,000,000 for public roads. Of course New York is a rich State; we can not hope to equal that in the State of Virginia. The State of New Jersey has increased her population in the last ten years to a greater extent than any other Eastern State, and it is not difficult to see why. She has paid the greatest attention to her road system, has appropriated money to build roads, and that money is all coming back to her.

This Jefferson Memorial road, as I have said, is meant to serve as an object lesson. I hear some ask: "Why select that road? Other roads in the county need repair much more than that." Very true; but other roads in the county can not get outside money to the same extent that this does, for it is of great historical interest.

So we selected that road for the object lesson, and we think we have made a very wise choice.

Your roads not only need repairing and draining, but in a great many instances they need relocating. On going outside of this town I have observed that your country roads run right over the hills instead going around them. It has occurred to me how easy it would be to relocate such roads; and I am quite sure that the persons who use them would give the right of way in order to get the benefit. How easy to run around the hill and save going up and coming down! We are carrying out this idea between here and Monticello. The old road goes up the hill and down again with a 16-foot grade, but by going around the hill a little way we have got a 4-foot grade.

This road was selected for improvement because some of us, indeed all of us, revere the memory of that great statesman, Thomas Jefferson. We believe that a memorial road to his home and grave will prove an inestimable blessing to all this section of the country. It will bring an increased number of visitors. These visitors will return to their homes filled with patriotic inspiration by the thoughts and deeds of this great statesman. [Applause.] If the great Jefferson, who is sleeping so quietly there at Monticello, could revisit these scenes and find that his countrymen, seventy-six years after his death, are designing this memorial which will stand in lasting attestation of his name and fame, he would surely consider it as the highest compliment that could be paid to him! We have not failed to read upon his tombstone there on the side of the mountain: "Here was buried Thomas Jefferson, author of the Declaration of Independence, of the Virginia statute for religious freedom, and father of the University of Virginia;" and he said, "By these testimonials I want to be known best." What does that mean? It means that while he had been President of the United States for eight years and chief executive of the State of Virginia; had given his country splendid service in foreign lands; and had been Secretary of State of George Washington's Cabinet; he preferred to be remembered as the author of the Declaration of Independence and the father of the University of Virginia. [Applause.]

Now a great opportunity is afforded to you. It is your cooperation and your interest in this matter that will make this road a great success. And I want to mention, "lest we forget," that Jefferson, lying on his last sick bed, gave his last thought to that great seat of learning, saying, "I wonder who will succeed me as rector of this university. I hope Mr. Madison will be selected, and that he and the other members of the board of visitors will make this university a great and enduring institution." Just before he closed his eyes on all the scenes of earth, Jefferson's thoughts went back to his university. Now, then, is it not the duty of those who survive, of all who admire the magnificent character and splendid deeds of that man, to do what they can to connect his university with his home and tomb by a big broad way, over which the pilgrims can annually go and drink at a fountain that never goes dry? [Great applause.]

ADDRESS OF WELCOME.

By C. W. Allen, *Mayor of Charlottesville.*

Those of us who have been looking around in the past year or so must recognize that no subject is receiving more serious thought than that of building good roads. We know that those communities in which this thought has taken the most definite shape, resulting in concerted action, have been the most benefited in every way.

A potent factor in this movement is the National Good Roads Association, whose president is with us to-day. His efforts are directed to the cause of better roads here as well as in other parts of the United States. To his efforts may be largely attributed the calling of this convention and the building of our sample road.

The National Government, recognizing the need and the popular demand for good

roads, has already established its Office of Public Road Inquiries; and to-day we have with us the chief of that Office. To his efforts also may be ascribed the calling of this convention, for he and the president of the National Good Roads Association have worked together.

To all who have come to attend this convention I wish to say we heartily and cordially welcome you. In the city of Charlottesville you will find the people hospitable and glad to see you. We trust that you may feel at home, and that you may go way from here feeling that you have been among friends.

LESSONS FROM MECKLENBURG COUNTY, NORTH CAROLINA.

By Dr. P. B. Barringer, *President of the University of Virginia.*

The presence of this good roads train in our midst is to my mind the greatest blessing that has come to Albemarle County in many years. It is one step in the education of this county. This object-lesson education appeals to all the senses. If you will put in three days on this subject I believe there will hereafter be a change of sentiment in this county regarding good roads.

The fault of the South is that the people have not learned to appreciate the difference between the education of the sixteenth century, which we inherited from our grandfathers [laughter], and modern education. We have not learned to appreciate the utilitarian element of the present century. We have put social duties and pleasures ahead of the duties of citizenship. Until we change that, until we come down and get to making taxpayers instead of politicians, we shall never do anything. [Applause.]

About three or four years ago, we knocked off work and put in a whole summer discussing the ratio between gold and silver. We did not have enough of either to quarrel over. [Laughter.] The fault of this country is that we think too much about political affairs. The average Southern boy knows more about politics than five Northern boys, and one Northern boy knows more about business than a whole Southern county. Let us change that. To make this convention a success we have got to have a change. That is the long and short of it. I am not a Virginian, as you know. I am a native of Mecklenburg County, North Carolina. Twenty years ago we had exactly the same problems that you have. I lived in the country practicing as a country doctor; got out at the call of every nigger within 20 miles, and went night and day. And the roads were such that my people had to leave home Friday night to go to church. [Laughter.] We made up our minds finally that we were going to have a change or a revolution, and you know what that means in the South. We had a man named Alexander, and his name is immortal. The Alexander road law went into effect. From that dates the beginning of the modern Mecklenburg County, with 45,000 inhabitants and $15,000,000 worth of assessed property. Before the change a doctor whom I knew was unfortunate enough to own a couple of thousand acres of land in that county, and he didn't make enough to pay the taxes on it. All his practice went to the maintenance of a few nigger tenants. The doctor determined to join the revolution. When we started in twenty years ago we had funds amounting to $10,000 a year (exactly what you have now), and we macadamized 3 or 4 miles of public road a year. To-day I believe we have over 100 miles of such road in that county, and we have a city of 30,000 inhabitants, which had the same population at that day as your town has now. In 1880 we had about 5,000; now we have 30,000. I know of a 30-acre farm that cost $10 an acre, and $46 an acre has been refused for it, and yet not a dollar has been put on it, not even to fertilize it. Some of the farms 5 and 6 miles from town have quadrupled in value.

Now all you have to do in this county to get these results is to do what we did, that is, go to your county commissioners and get them to resolve that they will not

spend a dollar on a road with a grade greater than 4 feet in 100. The next suggestion is, take every dollar that you can raise by taxation and build as much good road as you can every year. I am in favor of your new constitution because it gives the privilege of local taxation. The State is not going to tax you heavily any longer. It gives you local taxation, and you must be your own arbiters. First select a road and improve it for 5 miles out into the county. You can do that in two or three years. Then take another road. In my own Mecklenburg County, the townships bid against one another to see which shall have its roads macadamized first. A heavy tax is temporarily put upon the township getting the road, but the tax is not long continued. And as for the right of way the township never thinks of paying for that. The increase in the value of lands more than makes up for the right of way granted.

In the county seat of Mecklenburg, brick used to cost $10 a thousand laid in the wall. When I left there they cost $6. Why the difference? Because the price of wood used in burning them was greatly reduced by the improved roads. We have done one bad thing. We have ruined all the country churches. There is not a country church within 6 or 7 miles of our town. People will not support a church in the country when they can have a church in town. That is the only evil result I know of, and that will be remedied by local pride.

If you will do the two things I have said: (1) Declare that you will not waste money on impassable grades and in repairing mud holes, and (2) determine to put in during this next year 2 miles or more of public road well macadamized, you will lay the foundation for future prosperity in this county such as you have never dreamed of.

IMPORTANCE OF GETTING TOGETHER.

By Stuyvesant Fish, *President of the Illinois Central Railroad Company.*

What Dr. Barringer has said has impressed me profoundly, and if you will pardon me, I will say one word along the same line which is borne out by twenty-five years of observation as a Northern man, who has been devoting his time to the development of railroads and their industries in the Southern States, mostly in Mississippi, Louisiana, Tennessee, and Kentucky. It is in regard to this difference between you gentlemen of Southern birth and training and those who are of Northern birth and training. You have inherited the ideas and the traditions of large landed properties without proper means of transportation from one to the other, where on each great property the whole work of a town or a village had to be done. You had your sawmill, your blacksmith shop, your carpenter, your mason, all on each large plantation, and that was a kingdom to itself. Now in New York and in New Jersey, where my parents came from, and throughout New England, everything requiring considerable capital was done by a community of interest and a community of capital. If there was a sawmill to be put up no one person built it, but everybody contributed a little and it was built by a joint-stock company. I am talking of the days before the civil war. For generations of people there in the Northeast it was the custom to do everything large by almost every one in the community contributing a little. Here in Virginia, and more particularly in Louisiana and Mississippi, where the plantations were larger, such things were done by the landed proprietor himself; he did not seek the patronage of his neighbors, and he did not patronize their interests. What has struck me more than anything else in my relations with the Southern people has been this lack of community of interest and effort all through the South. I have been trying for years to get our friends in the extreme South, in the Lower Mississippi Valley, to combine their capital and combine their efforts on these various matters of common interest. You people of the South have opportunities for advancement which are superabundant. You have soil, you have

climate, you have standing timber, you have iron and coal in your mountains, but you lack the capacity of getting together in your combined strength and seizing the opportunity. [Applause.]

Now if I have said anything unpleasant, I hope you won't think it was from any lack of interest in the South, because I have given up my life to the development of a certain part of the South. True, I have labored as the representative of a great railroad corporation, but as such I have always known that no means of transportation, be it a navigable river, canal, railroad, or toll road, can live in prosperity unless its patrons are prosperous, unless the farmer, the miner, the manufacturer, and the proprietor of the sawmill shall continue to produce in increasing quantities valuable commodities for shipment. How else can they pay freights? How else can they afford to pay railroad fares? How can they contribute to the prosperity of a railroad? Only by being prosperous themselves. The carrier and the producer must get together and be firmly established in a community of interests.

It dawned upon me many years ago that we had in the United States generally a sufficiency of railroads, just as we have in this county and all over the country a sufficiency of wagon roads; but having seen the railways in England and elsewhere in Europe, I very soon perceived that our railroads were very inferior structures, and that we really needed better railways rather than more railways. And so it is with our wagon roads. We do not need more wagon roads, but we need better wagon roads. You have the material. The country in which I am interested in the Lower Mississippi Valley does not have the material. We lack stone and gravel. We have to transport it long distances to do what little we are doing there. But you have the stone and you have the gravel in your hills. I believe that this question of transportation is not beneath the attention of the highest minds. I want to remind you that, when George Washington had led the armies of the United States through a successful revolution against the greatest power on earth at that time, he retired to private life, and interested himself in transportation. What was he when he was called upon to become President of the United States? Why, gentlemen, he was president of a transportation company, of the Chesapeake and Ohio Canal Company, and that was in his day the highest order of transportation, calling for the largest expenditures of capital and the highest intellectual capacity; and from that position he was chosen to preside over the United States for eight years. Now, surely the business of transportation is something worthy the attention of intelligent, patriotic, high-minded citizens of this Republic.

REMOVING THE BURDEN OF BAD ROADS.

By Hon. Martin Dodge, *Director of the Office of Public Road Inquiries.*

In reference to the road matters in Mecklenburg County, I had the privilege recently of hearing Captain Alexander, the author of that Mecklenburg road law, state his experience. It seems that the people of Mecklenburg County, during the early history of that development, were not in favor of Captain Alexander's plan, and he was defeated for office when he stood for reelection to the legislature. [Dr. Barringer: If you will allow the interruption, they defeated him for the legislature, but afterwards reelected him, and five years later sent him to Congress.] That is my understanding. Captain Alexander's experience is a common one. You simply deceive yourselves when you imagine that you bring burdens upon yourselves by undertaking to improve the highways in a stable and scientific manner. We know very well from the testimony of all persons who are informed upon this matter, that instead of bringing burdens upon the community improved roads invariably raise these burdens from the community. You have these burdens, but you can overcome them. The most encouraging part of the system we are advocating is that these

FIG. 1.—VIEW ON OLD MONTICELLO ROAD.

FIG. 2.—SPOUT SPRING AND WATERING TROUGH ON OLD MONTICELLO ROAD.

FIG. 1.—JEFFERSON MEMORIAL ROAD—PREPARED SUBGRADE, AND FIRST COURSE OF STONE.

FIG. 2.—SAME—FIRST COURSE OF STONE AFTER ROLLING.

beneficial results can be obtained much more easily than you imagine. Within two weeks I heard the governor of your State say that, after investigating the subject, he had found no case where the people had undertaken to improve their roads and had levied taxes for that purpose where they had found it necessary to increase the tax above the prevailing rate, because the increase in the value of the property was sufficient to accomplish the purpose. This is the kind of encouragement we get everywhere, North and South, East and West.

I represent the United States Government in so far as it has a representative along this line at the present time. It is true that earlier in the history of the country, the General Government devoted large sums of money, aggregating millions of dollars, to the improvement of the highways, but latterly it has done very little, making only small appropriations from year to year for the purpose of securing useful information and disseminating that among the people. I see Lieutenant Shaw sitting in the audience here, and I will say that he first called my attention to the desire on the part of citizens of this vicinity to have something done in highway improvement. He asked me if we could not build an object-lesson road here that would display the essential principles of such work; and I replied that I thought it would be very useful if such an object-lesson road could be built from your city to Monticello. He agreed at once with that, and I sent an expert here to make an examination. You know we have a number of experts in different parts of the country examining the materials out of which roads can be made. We also have at Washington a laboratory for testing these materials. I sent an expert to make an examination of the Monticello roadway. He found that the road running up to Monticello had a maximum grade of 16 per cent, and we determined right away that it would be a waste of money, and a display of ignorance, for us to recommend or assist in the improvement of such a road. So I stated that we would not undertake to do anything on the part of the Government unless there could be a relocation reducing the grade to a reasonable maximum. A skillful engineer was employed, and he has made a relocation of that road so that it will be possible to make the ascent with a maximum of only 4 feet in 100 instead of 16 as heretofore. That relocation having been made, I was very glad to do everything in my power to aid in the construction of this road which will become an object-lesson to people in distant places as well as to those in this vicinity.

In regard to the cooperation we secured, let me say that the owners of property have been liberal in giving the right of way, the city council has been liberal in making an appropriation of money, the county commissioners have also been liberal in making an appropriation, citizens living in your midst have been liberal in contributing to the fund, and I am informed that persons living in places rather remote have contributed more or less money. Then the National Good Roads Association, of which Colonel Moore, sitting here, is president, brought its forces in, and the Southern Railway Company, following the example of the Illinois Central Railroad Company, represented by Mr. Stuyvesant Fish, has assisted by transporting the road-building machinery free, and the machinery has been furnished by certain road-machine companies; so you will see that we have here cooperation all along the line. We did not expect to be able to accomplish the entire result of building this road from Charlottesville to the gates at Monticello, but we did expect to locate and begin it so that it will be possible to complete it in the most admirable way. We did expect to give an example of road construction, and we did expect that there would be sufficient enthusiasm aroused here to secure the completion of the road. I am greatly encouraged by what I see. I am ready to believe that the results will be more beneficial than almost any of us expected.

We hope that in the course of time a new memorial bridge, costing not less than $10,000, will be built at Moores Creek (figs. 1 and 2). We hope and expect that a magnificent fountain will be erected at the roadside where the old drinking place

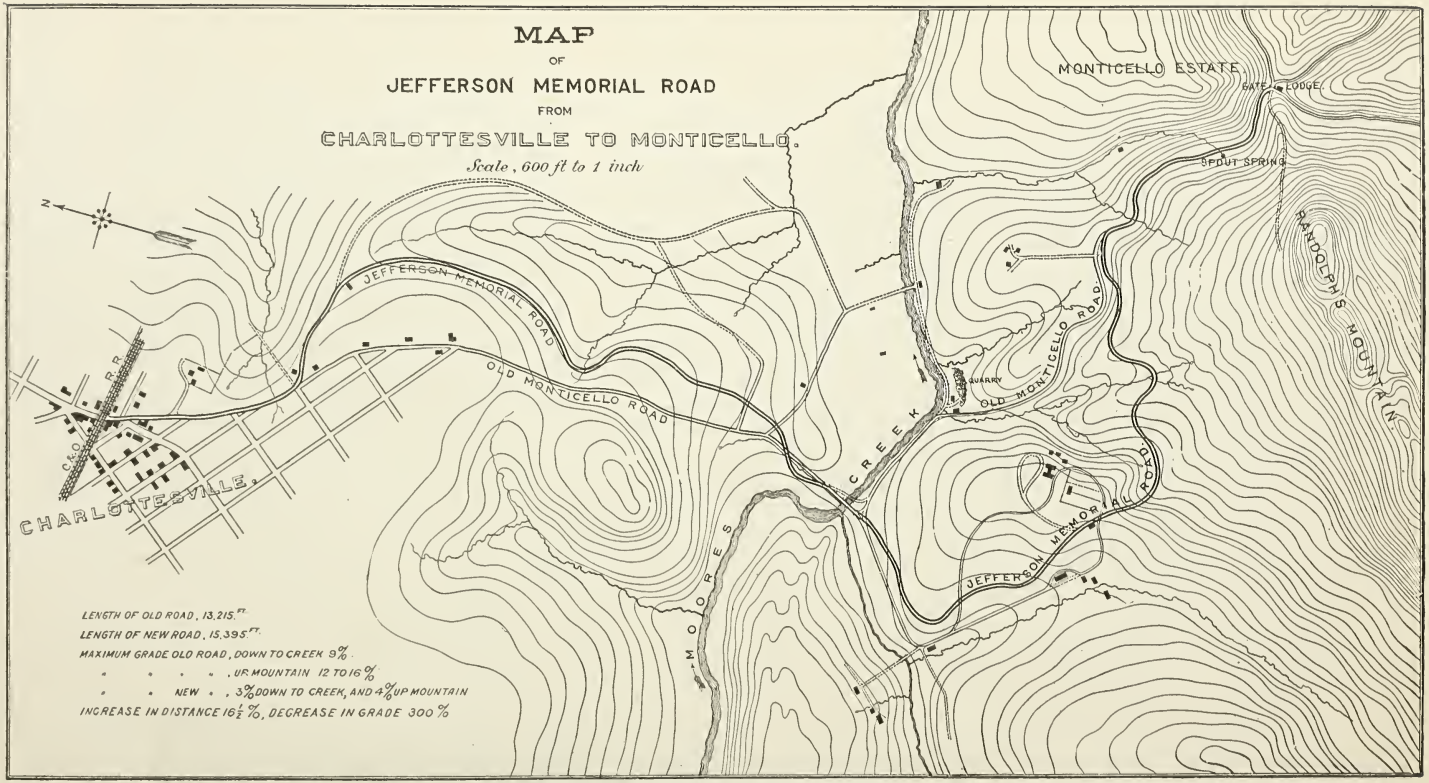


FIG. 1.—Map of Jefferson Memorial Road.

used to be and where the fountain still gushes forth (Pl. II, fig. 2). And, finally, we hope to have a sort of triumphal arch at the close (fig. 1). All of these, however, will be ornamental in their nature and none of them essential to the utility of this road. I think there is no doubt that we shall be able to raise sufficient money to make the necessary improvement within a short time; and these ornamental features, I believe, will come through the help of friends.

I will remind you again of the fact that the General Government did, very early in the history of the country, make very large appropriations to pay the entire cost of building a number of highways, and notably the great national road from Cumberland, Md., west through Ohio, Indiana, and Illinois to St. Louis. That is the longest straight road ever built by any government in the world. It cost about $7,000,000 and is 700 miles in length, making it cost about $10,000 per mile. Within the past few years Congress has been induced to take favorable steps looking toward road improvement. In 1893 it made a small appropriation of $8,000 and created the office of which I have the honor to be director, having succeeded Gen. Roy Stone, whom I see on the platform now and who will speak to you. We may say therefore that in 1893 began a sort of revival of activity on the part of the Government. Small annual appropriations have been made since that date, increasing a little of late years, until we now have $20,000. Of course we are not able to build roads, but only to assist, through such cooperation as we have here. It is said "The Lord helps them who help themselves." Similarly the Government of the United States is endeavoring to help them who are willing to help themselves.

There is a feeling in some quarters that the Government might be led to do too much, that it might spend too much money, and that it might do things which the State itself had better do. I want to remind you that the cheap rates of transportation which prevail upon our rivers, on the Great Lakes, and upon the great steam-road systems throughout the country have been brought about in a measure by the friendly assistance of the Government of the United States. You all know very well that for more than a generation the Government of the United States has appropriated annually millions of dollars, aggregating now about $440,000,000, to deepen the harbors and rivers and other interior waters of the country. The Government has also been very liberal in its grants of land and subsidies to many Western railroads. We have in fact made less progress in improving our highways than in any other direction, and yet there is more need for improvement along this particular line than in any other. The railroad companies are not particularly suffering. I am glad to hear Mr. Fish say there is no need for any more of these. We have gone through with the period of railroad development. It has been well done. We have cheapened transportation so that it is one-tenth of 1 cent per ton per mile upon the deep waters. It is only about one-half of 1 per cent per ton per mile upon the steam railroads on the long haul. But with your wagons on the common roads the cost of moving freight is 25 cents per ton per mile. The cost of moving 1 ton 5 miles equals the cost of moving it 250 miles upon a steam railroad or 1,000 miles upon steamships. We want to overcome as much as we can this great inequality. We want to take off the burden that rests upon the shoulders of the people.

We commend the principle of State aid. If the State contributes to road improvement out of a general fund to which all the taxpayers contribute, then your revenues do not come from the hand of the farmer alone, but from all the people, and especially from those that are more abundantly able to bear the burden of taxation. In those Northern States where the principle of State aid has been adopted, those who live in cities have signified a greater willingness to contribute to that fund than those who live in the rural districts, notwithstanding the fact that the law prohibits the use of that money within the limits of cities and towns. State aid tends to equalize the burden of taxation.

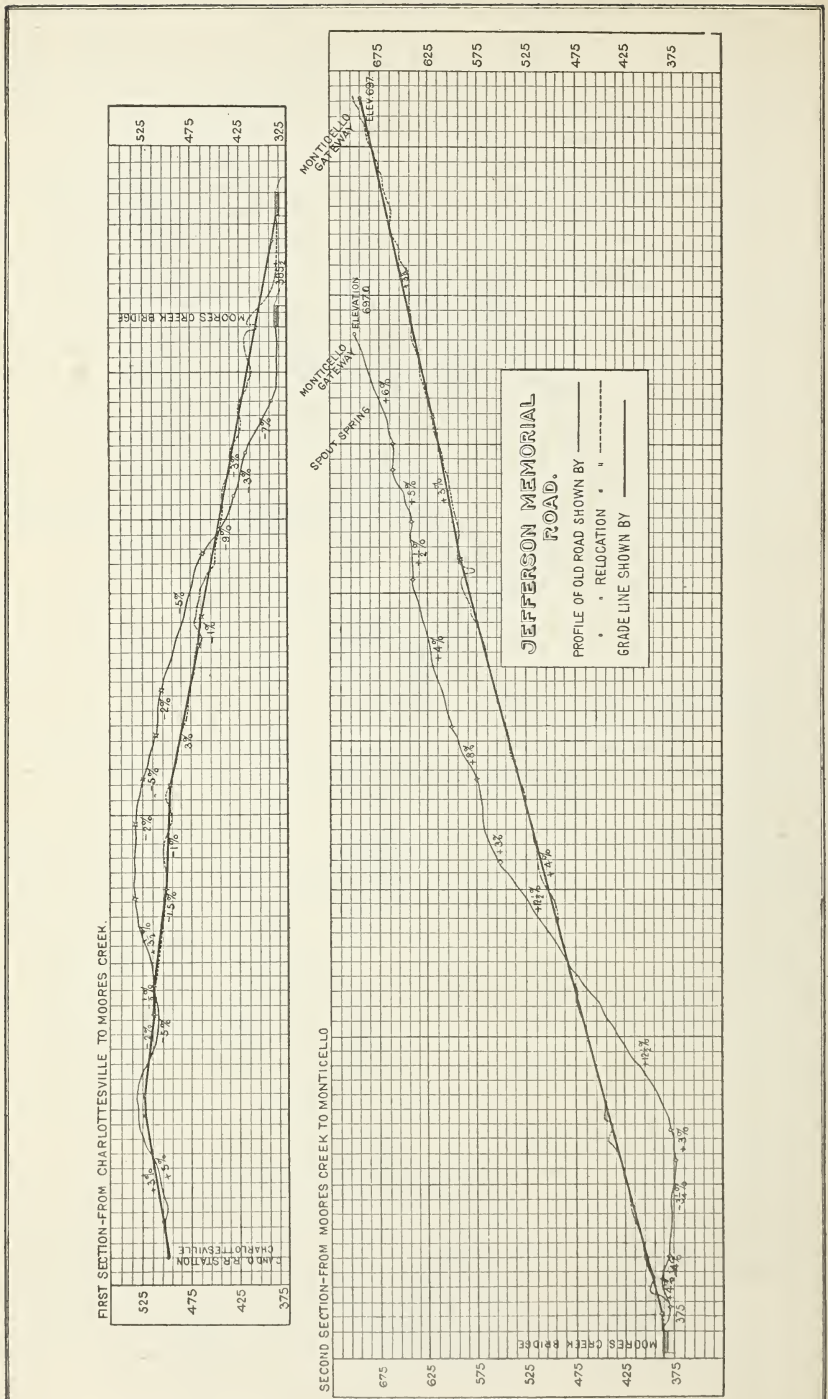


FIG. 2.—Profile of Jefferson Memorial Road.

The county should also certainly do its share. It will be worth while to study the Mecklenburg County road law. When we had a State convention at the capital of North Carolina Captain Alexander made a statement of the details of that plan,

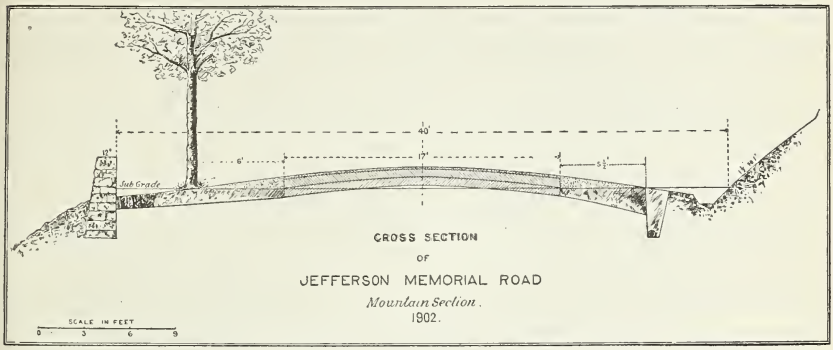


FIG. 3.—Cross section of Jefferson Memorial Road.

which will be published by the Department of Agriculture. It is a part of the work of the Office of Road Inquiries to prepare literature and give information in every possible way concerning road subjects. [Applause.]

REPORT OF COMMITTEE ON PERMANENT ORGANIZATION.

At this point the committee on permanent organization, consisting of Messrs. Daniel Harmon, C. P. Shaw, Frank Magruder, Murray Boocock, and C. E. Vawter, reported the following nominations:

Permanent chairman, Gen. Fitzhugh Lee; vice-chairmen, Hon. Martin Dodge, Dr. W. C. N. Randolph, Hon. Jefferson Levy, Dr. P. B. Barringer, Hon. C. W. Allen, and Hon. John B. Moon; permanent secretary, Mr. R. W. Richardson; assistant secretaries, Mr. Jos. W. Everett, Mr. W. C. Scott, jr., and Mr. E. S. Maloney. The report of the committee was adopted.

The chair next introduced Col. W. H. Moore, president of the National Good Roads Association, who spoke as follows:

WORK OF THE GOOD ROADS TRAIN.

By Col. W. H. MOORE, *President of the National Good Roads Association.*

It is easy to talk about the National Good Roads Association and about the Government of these United States and what they are doing. But after all the pivotal question is, "What are you doing in your own community?" We can not come from Washington and from Chicago to build your roads. We can only give you an object lesson. The question comes home to you locally and you can not get away from it. I might ask you also, "What have you done in the past to benefit these roads? What have you done to improve your streets?"

This road question is one of National importance. We find the same interest here as prevailed in neighborhoods that we have visited from ocean to ocean and from the Gulf of Mexico to the Great Lakes. We have not yet been in the States of Minnesota, the Dakotas, Washington, Oregon, Colorado, California, or Utah, but are planning to visit them.

It was a difficult task to start a good roads train. Mr. Stuyvesant Fish seemed, at the time of starting the Illinois Central trip, to be the only railroad president having the true conception of the great road problem and the beneficent results that would follow such educational work. In the States visited by the train the people are organizing road associations and preparing to spend thousands of dollars upon highway improvement. In Mississippi, for instance, they have very little stone or gravel, and yet they are making progress down there with Governor Longino at the head. It is true the Mississippi legislature did not pass a good roads bill this time; a great many people say they do not want it. But they are organizing in Mississippi, and within the next two years they will enact road laws, and they are going to build good roads.

The road question is the biggest proposition before the people. It is forcing itself into the legislatures. In 1904 you will have it in your National platforms. In your State legislatures two years from now you will have it, and the gentlemen you send from this community will give more attention to the road question than they have for twenty-five years past. Everything of an industrial character must come through politics. In the Northern States we find both parties putting the good roads question in the platforms, and when you get these things in the platforms in a short time you will get the best men of the community to take up this road cause and get better results out of the money you are spending.

You are spending about $12,000 a year in this county. I do not know how you raise the money, but I do know how you can raise it. I might say that $12,000 a year is only a beginning; it is not enough to make any substantial progress in your county. Every street car that you have here, every steam railroad, every institution of any great magnitude has been inaugurated by issuing bonds.

Now, in regard to taxation, as a rule the people of the cities are better able to stand taxation than the farmers. Many farms are not paying enough to support the farmers' families. Now, then, if you should adopt a plan of bond issue—and I think it is coming to that—if you issue bonds to the extent of $160,000 or $200,000, the $12,000 you are spending now would pay the interest and provide a sinking fund. Then you could make 80 miles of stone road in your county and 150 miles of gravel road. Now just sum it up. You will find that it amounts to only about 3 cents an acre annually. It is worth your while to consider that.

When we came here we found the road to Monticello in the same fix as it was when Thomas Jefferson used it. You have done little or nothing, gentlemen, to improve its condition.

Each year the United States is sending $50,000,000 or more to Europe. Those millions are spent by American tourists in Europe largely on account of the good roads they have there. You people who have been there will remember that you can ride almost all over Europe on good roads; you can go anywhere you wish. There is no country that has better roads than France. Its people are thriving. England, Germany, Italy, and many other countries of Europe have good roads. But now is it here at home? Within 113 miles of Washington are the homes and final resting places of Monroe, Madison, and Jefferson, three of our greatest Presidents, yet two-thirds of our members of Congress do not know anything about the conditions here, and do not even know where Monticello is. You should not be surprised that tourists are not coming here to visit you. How do you expect them to come? How do you expect them to send their sons to the University of Virginia?

Now, for the sake of local pride, for your own interest, let me urge you not to stop, not to find fault with those gentlemen who are interested in completing this Jefferson memorial road. Do not say you take no stock in the movement. You join these gentlemen and get that road completed. If you do that, my judgment is that within five years we will induce the Government of the United States, with your help, to build a Jefferson, Monroe, and a Madison memorial road. I believe that you can

make it pay, because you will bring thousands of pilgrims here that will spend hundreds of thousands of dollars in your midst. Do not find fault; raise as much money as you can locally, and I am sure that we will take this matter up. That is one reason we are bringing the Congressmen here.

I shall not say anything about the roads in your county. You will meet with difficulties in road building, but take hold of your local conditions. Make Charlottesville better known on the map. Try and induce Congress to help you make this one of the most historical points in the United States. I believe there is a movement on foot to connect the tomb of Washington at Mount Vernon with the city of Washington by means of a boulevard, the same to run through Arlington, Lee's old home. Now, that road is no more to the people of the United States than this Jefferson road; but you will not induce the Government to do anything at the present time. You are not quite ready for this; but when you invite the Senators and Representatives down here two years from now and show them a splendid road from the University of Virginia to Monticello, as well as other good roads, I believe you will induce them to take a great deal more interest and prepare the way to extend a finished roadway to Washington.

Now we are arranging to run a train away up through the Northwest to bring those States into line. In other words, we are endeavoring to establish uniform road building throughout the United States, and we want each place to profit by what the other communities are doing. When you see what other States are doing and you pattern after their best plans of organization, it strikes me you will do something.

Remember this point above all, that you must organize and prepare to build your roads locally out of your own money. We have tried to show you how to do this. Take this matter home with you.

Vice-chairman Dodge. I appreciate very highly the honor of being chosen to preside temporarily in the absence of the permanent chairman. I now have the pleasure of introducing to you my predecessor in the Office of Public Road Inquiries, Gen. Roy Stone. He was virtually the founder of that Office, and is a gentleman of great experience in all lines of road building and perfectly in sympathy with your cause.

THE NECESSITY OF CONGRESSIONAL ACTION IN ROAD IMPROVEMENT.

By Gen. Roy Stone, *of New York, formerly Director of Office of Public Road Inquiries.*

I have to apologize to a Virginia audience for inflicting upon them my written speech. It is not that I could not talk to you about good roads by the hour without any writing, but I happen to have something very important on that branch of the good roads subject to which your honored chairman and your vice-chairman have referred, and that is the necessity of Congressional action in road improvement. I put it in writing because I can give it to you more briefly and more in the abstract.

This occasion, which is so momentous to Virginia and so auspicious for our whole country, has a peculiar personal interest for me, for it carries me back through ten years of my life—years which have been devoted almost entirely to the one object for which we are assembled here to-day—and brings to my mind the hopes and fears with which I called the first national convention for good roads ever held in the United States, staking my reputation upon its success and risking, out of a slender purse, the entire cost of the venture. But it succeeded, and the National League for Good Roads was organized, and $10,000 in cash was raised and expended in its first year's campaign. Then the attention of Congress was awakened by holding a con-

vention in Washington, and the Office of Road Inquiry was established. What that office has done you well know, and I think I may say without vanity that its plan of operation and its effective methods of enlisting outside aid in all its measures have drawn more private means to supplement a small appropriation than has often, if ever, been done in any department of the Government. No one would believe that all its varied and widespread activities could be maintained on the trifling sum of $10,000 a year. The railroads of the country, however, with wise foresight, have given it liberal assistance, local associations have supported it everywhere, and in late years the National Good Roads Association has come out of the West to push the movement all over the land. In this work the good roads forces will have the support of every commercial, financial, and manufacturing organization in the country. The Chamber of Commerce of New York tersely says: "The products of the United States are handicapped in all the markets of the world by a needless cost in their primary transportation, which goes far to nullify the advantages they enjoy in all other respects."

Another powerful interest which has joined in the battle for good roads and which will be a great and growing factor in the future is that of the automobile. The users and makers of these machines are as urgent for highway improvement as the farmers or wheelmen, and their influence is already being felt. Their constant efforts at Albany have secured the expenditure of two millions in money for roads in the State of New York this year, and the Automobile Club of America has just arranged to make a test of steel track roads for the public benefit at a cost to itself of $10,000, and, if the test is satisfactory, to promote the general construction of these roads throughout the country.

And not only is every material interest in the land concerned in road improvement, but important moral and social interests are deeply involved as well, and even our national pride has begun to take fire at the national shame of our highways.

The road movement, therefore, is one to be reckoned with by the highest intelligence of the country. The question of how it can best be advanced must soon be a question of the hour in the practical politics of the nation, and, with party politics in their present nebulous and formative condition, this question may suddenly spring into great prominence.

This convention, if I judge it rightly, will not be afraid to take up this problem in the highest aspect of its National relations. Virginia, and I presume the majority here are Virginians, has been the birthplace of great ideas as well as great men, and if this gathering should mark the beginning of a definite and effective National policy of road improvement, it will add another glory to crown the Mother of Presidents.

PRESENT CONDITIONS AND REMEDIES.

Our campaign for good roads has aroused the public interest and silenced opposition, but it has revealed at the same time one of the most curious limitations of popular government, namely, that people who govern themselves will not tax themselves to build the roads they know they need. Means must be found, therefore, to lighten the burden of cost if we are to make any substantial progress in this regard, and evidently the first thing to do is to shift a portion of that burden to shoulders that are willing to bear it, but have now no opportunity to do so. The common roads of the country are the common concern of the whole people, but nearly half of the people and nearly all the concentrated wealth of the country have no share in building them.

In this important matter of highway improvement we have taken a long step backward in the past century. A hundred years ago our statesmen fully recognized the universal concern in highways, and a great system of National roads was laid out and begun. Why not return to the wisdom of the fathers? In other lines of public

enterprise we have freely used the National means and credit and spread the burden equally upon all the people. In this manner rivers and harbors have been improved and railroads profusely aided; but the common roads have been neglected and then abandoned, and their expense thrown wholly upon those least able to bear it.

In our insular possessions the Government does not shrink from road making to-day. We are building highways in these new possessions as costly and permanent as the Roman ways, while American farmers are left to build their own roads or go without.

Clearly, then, there is no constitutional barrier or other insuperable obstacle to Government action in this matter, and it is only for the statesmen of to-day to discover or determine the proper form for that action to take.

NATIONAL AID.

It may be proper for me here to suggest some of the forms of National action which have been discussed among the friends of good roads. The simplest and most obvious one is that of a direct contribution of a certain share of the cost in cases where suitable State and county aid is given to lighten the local burden. This would involve a National and State supervision of location and construction of roads and disbursement of funds which would secure intelligent work, and would stimulate progress.

Another and more economical plan would be by Government guaranty of county road bonds upon condition that the State give to the United States the right to take tolls on the roads to pay interest on the bonds in case of default by the county. This right would be rarely, if ever, exercised, since the rate of interest under a Government guaranty would be so low as to make it easily payable, while the taxable values of the county would, according to all experience, be increased from five to ten times the amount expended on permanent roads. These bonds would thus multiply their own security. They would be a favorite investment for trust funds, security for bank-note circulation, etc.

POSTAL SAVINGS BANKS.

Another plan of road improvement allies itself with a proposed public benefaction of a different kind, each one aiding the other and both going far toward perfecting the conditions of rural life.

Every civilized government but ours, and some that are but half civilized, give their people the benefit of postal savings banks. We refuse it to our people, ostensibly because we can not find a proper investment for the money, but really because the banking interests of the country stand in watchful opposition to the measure. When this opposition can be overcome postal savings banks can be established to the great advantage of the rural districts and of the general welfare, and the deposited money can be invested in county road bonds, guaranteed by the States, bearing a rate of interest so low that it can be paid out of existing road taxation.

Whoever will take the trouble to work this plan out in figures will find that good roads can be built almost everywhere, and without long delay, with no material increase of taxation and no cost to the Government whatever.

Estimating the deposits in the postal savings banks in the United States on the basis of those of Great Britain, we should in ten years have enough to build 1,000,000 miles of stone or gravel roads.

A NATIONAL HIGHWAY.

If we do return to the wisdom of the fathers, why may we not revive and enlarge upon the grandest of their conceptions and build a National highway—not to the Mississippi, as they proposed, but across the broad continent?

It is often easier to do great things than small ones, of the same kind, and this would be something big enough to excite the imagination and stir the pride and

patriotism of the country. The time is ripe for it. The old century went out with the triumphs of war and expansion. Let the new one bring in a triumph of peace and internal development. The country has wealth and credit abundant for the work. Moreover, the revolution taking place in road locomotion demands such accommodation in America in order that we may take our proper place among the nations.

Where should such a road be built, and how?

Various States are already building, or proposing to build, object-lesson roads, and these roads might, by judicious combination, be so located as to connect and form a continuous line and part of a continental route.

The Eastern division of this National highway should join all the States on the Atlantic by a coastwise line, and its Western division should do the same on the Pacific, while the continental division should connect the Eastern and Western divisions by a line from Washington through the central cities of the country to San Francisco.

Between Washington and Cincinnati low passes are found through all the mountain ranges within 7 miles of a straight line from city to city; the main plateau of the Alleghenies can be surmounted by a long incline with a grade of only 4 per cent, and that limit of grade need not be exceeded anywhere between the oceans.

These lines would traverse or touch two-thirds of all the States in the Union; they would run through the most picturesque regions of the country and the scenes of its greatest historical interest.

Along the east coast the road would be over the storied route of march of the Continental armies; crossing the Memorial Bridge at Arlington, it would traverse the civil war battlefields of Virginia, Kentucky, and Missouri; farther on it would follow one of the trails of the great explorers, and on the Pacific slope it would strike the oldest road on the continent, the Camino Real, or Royal Road, which joins the ancient Spanish missions.

This road should be worthy of its builders and of the age. It should have broad steel tracks for wagons, carriages, automobiles, and bicycles, bridle and foot paths, plenty of shade and fountains, plenty of room on the borders for ornamental trees and plants, not set in stiff rows, but artistically grouped or scattered, the whole forming a continuous and practical lesson in forestry, floriculture, and landscape art, as well as in road building.

Before many years such a road would be lined with handsome villas through the mountain sections, model farms on the prairies, and villages and wayside inns everywhere. It would become the main artery of American country life.

The cost of such a road is difficult to estimate, but there are some data for comparison.

The Government is now making, at an expense of $11,000 per mile, a stone road in Porto Rico, which follows the difficult canyons of the Arecibo and Fortugues rivers and crosses the precipitous mountains of the Cayey Range. Labor is cheap there, but, on the other hand, labor-saving machinery is barred out in order that the work may furnish the greatest relief to a suffering people. This whole line is more difficult to construct than would be the worst portion of our National road, but our road would be wider and better in many ways. All things considered, it would not be wise to estimate the cost at less than $20,000 per mile.

The equitable distribution of this expense would not be so difficult as it might seem. The General Government would naturally build the road through public lands and reservations and the District of Columbia, and would especially aid the Territories in building their portions.

Through the States a fair distribution, according to benefits, would perhaps be one-fourth to the Federal Government, one-fourth to the State, and one-half to the lands lying in the zone of local benefit. This zone would not be less than 5 miles in width on each side of the road, making 6,400 acres to the mile of road; $10,000 for

this area would be $1.50 per acre; but the assessment would be adjusted by local boards, according to the proximity and value, ranging say from $5 per acre on the best abutting lands down to 50 cents on the poorest or most distant. To lighten this burden to landowners the Government could safely advance the money at a low rate of interest, taking liens on the property and let the owners pay it off at their convenience, with interest at a low rate. On the highest assessment the annual charge at 2½ per cent for interest and sinking fund would be only 12½ cents per acre; on the lowest, 1¼ cents per acre.

The general advance in value of the property along the line would enhance the national wealth by hundreds of millions of dollars, which would be taxable by the the States, while so grand a lesson in the benefits of good roads would stimulate road building everywhere. State governments would learn to follow the same plan of anticipating benefits and easing the burden to landowners. States on the line of the National road would build branches to it and those not on the line would combine to reach it.

The first steps in so great an enterprise should be cautious and slow. A commission composed of one member from each of the States concerned, a representative each for the Departments of the Interior, Agriculture, War, and the Post-Office, and one or two from the Good Roads Associations, without salaries, could be assembled to discuss the legislation, State and national, which would be required to inaugurate the project, while a detail from the engineers of the Army, the Geological Survey, and the State highway commissions could be making a preliminary study of the routes. This would involve but a trifling cost, while it would speedily develop the facts, upon which Congress and the public could base a judgment as to whether it was worth while to follow up the project.

But whatever form National aid shall take, whether that of direct contribution, a guaranty of bonds, the postal savings plan, a National object-lesson road, or some other form yet to be devised, the day that sees the Government of the United States fully committed to the improvement of the common roads of the country will mark an era in the progress of the Nation and the prosperity and happiness of the whole people.

SECOND DAY—THURSDAY, APRIL 3, 1902.

THE JEFFERSON MEMORIAL ROAD.

By Lieut. C. P. Shaw, U. S. Navy, retired,
Member Executive Committee Jefferson Memorial Road Association.

Some fourteen months ago a casual word of Director Dodge, of the Office of Public Road Inquiries, started this ball rolling which has assumed such tremendous proportions. At first it seemed like a very simple proposition to build an object-lesson road to Monticello. The first requirement of Mr. Dodge was that the road should be built as ordinary object-lesson roads are, the Government providing engineers and experts. On that plan the agitation was begun and the matter started.

The first thing that had to be done was to establish a proper grade (fig. 2). This is a very important proposition in road building. If you do not have the proper grade all your work is thrown away. In the present case the grade on this side of the creek is some 9 feet in 100; on the other side, going up the hill to Monticello, it is 16 feet. Now, the practical effect of that grade is this: The cost of hauling between here and Monticello and other points beyond the mountain is made about four times as great as it ought to be, and the burden of this expense is borne partly by the farmers whose teams struggle over the road and partly by the people who buy the products brought in by the wagons drawn by those teams. The expense is always

divided in this way; the law of supply and demand regulates the price of articles in any market.

I took the trouble to have a record made of the traffic on the Monticello road, and I found that during one week there was an average of 90 vehicles a day passing over the road. I ascertained what would be the excess in cost of hauling over that road compared with the cost of hauling over a road which we could obtain with a maximum grade of 4 feet in 100. It would seem that it costs four times as much to haul over that road in its present condition as it will cost when it is improved along the lines which we propose to follow. Taking that traffic of 90 vehicles and cutting it in two, we have 45 vehicles making the round trip. The cost of hauling to this point from Monticello is certainly $1 a load—no man could do it for less than that. That represents an expenditure of $45 for the teams, wear and tear, time of the drivers, etc., of which sum at least three-fourths are unnecessarily spent or thrown away, because if that road were improved one-fourth the number of trips of the same vehicles would do an equal amount of hauling. That places us in the position of wasting every day nearly $34, or in the whole year a gross sum of more than $10,000.

The same sort of reasoning applies to nearly all the roads of Albemarle County. We have roads that need relocation almost everywhere. There is hardly a road in the neighborhood of Charlottesville which could be materially improved without relocation. Now, in the case which we have in point the grades are reduced by the proposed relocation (fig. 1) from a maximum of 16 to a maximum of 4 feet in 100, the distance being increased less than 20 per cent; that is to say, the road now is a little over 2½ miles in length, and the new road will be a little less than 3.

Now, one of the great points often overlooked is the immense increase in value of property lying adjacent to a road when it is improved. In Mecklenburg County, North Carolina, which is topographically very similar to Albemarle, they had the same obstacles and the same problem of relocation. Those problems they have solved successfully. The county began about fourteen years ago the systematic improvement of its roads, and it has now nearly 100 miles of good stone roads. And their means of making these roads are very little superior to ours. The assessed valuation for taxation there amounts to $12,000,000; in Albemarle County, including the town of Charlottesville, it amounts to $9,000,000. We have three-fourths of their means. But they make every year about 9 miles of road, while up to the present time we have made none.

The way they accomplish that is this: They have a separate tax rate, 18 cents on $100. They devote the whole of that tax to the construction of new roads, but they utilize convict labor, that is the key of the whole problem. [Applause.] It has been determined that by using convict labor the cost of building a road is less than half what it is under the free system. In using their convict labor they found that the cost per head, that is to say, the cost of each convict to feed, clothe, guard, etc., was 25 cents a day. That labor becomes the most efficient labor in the world. Your laborer who is free to come and go as he pleases is very apt to turn up missing some fine morning; every farmer knows this; there is a "big meeting," perhaps, and the laborer wants to attend; but the convicts can not go to meetings.

It is only necessary for us to do certain things to produce the same state of affairs as in Mecklenburg County. We have the same kind of country; we have an equal tax rate, and a nearly equal tax fund; and, if we exert ourselves to amend our laws and give us the benefit of this convict labor, we can have about the same state of affairs as exists to-day in Mecklenburg County. We have in this State, in the penitentiary, some 1,500 convicts, of whom at least 1,000 are able-bodied men. Taking these 1,000 able-bodied men and working them as intelligently and skillfully as they do in North Carolina, we ought to produce about 120 miles of good stone roads every year. And what would be the effect of this? The increased valuation in property, putting it at $10 an acre, would amount to more than $1,000,000 added to our State every

year as a result of using these convicts. If our present system of handling the convicts gives the State a net return of $50,000 we are getting only one-twentieth of what we ought to have. If our laws were so amended as to give us the benefit of the tramps and vagrants, another thousand laborers would be put on our roads.

I do not think this state of affairs is very creditable to our legislature, and I hope that men will be elected who will recognize the interest of the people at large and give us laws by which we can avail ourselves of this great force, which is misdirected or, worse still, is used for the benefit of a foreign corporation.

Intelligence and skill and the use of free labor reduced the cost of roads in New Jersey to about $4,000 or $5,000 a mile. This is more than we can stand here; but if we use our convict labor that cost would be brought down at once to less than half that amount. Two-fifths is the exact proportion that has been established; $1,600 to $2,000 would give us a mile of good road macadamized, 12 feet wide, properly ditched and drained. Of course, in the beginning we do not propose to build first-class roads all over the county. We must go slowly at first. The expense will be far less than we waste every spring in scraping the mud out of the gutters to be washed back by the first rain storm.

It is within the province of our legislature, if it saw fit to do so, to amend our laws, as was proposed in the recent act which came so near passing, and send all short-term convicts to the public roads. The effect of that would be to reduce at once the congestion in the penitentiary, with its train of filth and misery. Out of the 540 convicts sent to the penitentiary in 1901, 425 had terms of five years or less, so that one simple amendment to our laws would at once relieve the congestion and would give us a working force. That is a very simple thing to ask of the legislature, and we are going to keep on asking it; and as this movement grows we will demand it. [Applause.] The people have rights, and when they rise in their strength and demand them they are going to have them recognized. We are going to fight this out to a finish. This road movement is growing like an avalanche, and will sweep those people out of power who fail to see the people's rights. [Applause.]

This Monticello road is bound to grow. The experience everywhere has been that when a good road is once built the people realize its value; they see the comfort and ease with which they move their produce, the swiftness with which the doctor can come in time of need, or the ease with which they can go to church; in all these things they realize the great and abiding comfort that comes from a road permanently made good.

Now, the contrast between earth roads and stone roads is appreciated. There is a very simple instrument, known as the tractograph, which will show simply and exactly the effort it takes to move loads over the road. This arrangement, like a pointer on a butcher's scale, is attached to the tongue of a wagon, and as the team moves that pointer shows the load pulled. Put this on a road of only 4 per cent and see the slight effort; then on a 9 per cent grade and see the teams strain and sweat. That will explain better than anything else the way in which the grade affects the road. Another point about a good road is this: You take an earth road at its very best, when it is smooth and hard and dry. It looks like asphalt; it glistens in the sunlight. Take that road at its best, and then a macadamized road alongside of it, and you will find that a team will pull much more over the macadam road than over the other. Besides, while this earth road is only good a few months in the year, the macadam road is hard and smooth the year around. A little snow or a little rain makes an earth road soft, muddy, rough, and then dusty.

We want to get out of that condition here in Albemarle, and I believe if we start this movement and get one or two well-selected roads built as they ought to be the people will want them so badly that they will go to the polls and vote for men to represent their wishes, and will insist that the laws shall be so amended that we can make use of the vast amount of convict labor that is lying idle or misdirected. We

must organize, we must combine, and make our wishes known; for just as soon as the legislature realizes that the people are in earnest it will change the law. We do not want our State to violate her faith and break her contract, but we have made no contract to send 800 people to the penitentiary; so we shall get our rights.

Among our allies we find the labor organizations: For those convicts make shoes in the penitentiary, or other articles, that compete directly with free labor. If they are put on the farm to raise corn or wheat they compete directly with the farmer. But on the roads there is no demand for free labor, and there is, therefore, no opposition to convict labor, and that is the place where they ought to be, and we must work for this. But we must organize; we have got to have an organization of earnest men who will insist on their rights. I invite everybody here to join us in the attempt to get out of the mud, to get rid of the dust, and enjoy the fruits of civilized influences that will always come from these smooth highways.

We hope to carry this memorial road on across the creek and then up to Monticello, so that the people can see a real up-to-date stone road. Perhaps a little explanation is due here. The road was selected for these reasons: At the end of that road, in that shady spot on the mountain side, lie the mortal remains of the greatest statesman Virginia ever produced. I say that without fear of contradiction. Washington was a hero, a soldier, a statesman; Jefferson was without a peer. Now we can get the means to build the road that leads to the grave of such a man as that. His name is revered throughout the length and breadth of this land. Just at this time, when that great exposition is being prepared for in St. Louis in order to celebrate the famous Louisiana purchase, his name is heard everywhere, for his name is associated indelibly with that movement, and thousands of people wish to come here to pay homage to his genius. They come here to visit that tomb; and do they wish to go at the risk of their lives up that wretched gully that we call a road? [Applause.] I went up there a short time ago with some gentlemen through the snow, and it really seemed like risking our lives. Fortunately our horses were sure-footed and kept us in the track. We want to improve this. Strangers come here and say: "These people in Albemarle County appear to be satisfied; they surely are not very progressive." We want to remove the stigma of having it carried through the country that we are satisfied to call that a road. We must have a beautiful smooth road, and then people will say that we are progressive. Every day these real-estate men will tell you that customers are driven away because the roads are so bad. We propose to remedy this; that is the object of this work. That road may be the best road leading up to Monticello, but at the same time it is so very bad that it works to the serious disadvantage of this vicinity. Jefferson was a great believer in the cause of good roads; he advocated it, he worked for it. If he could see us now working on this road I believe it would be an especially gratifying sight to him, and I want to be one of those to carry to a successful end a reform that he worked for, but which he did not live long enough to see. [Great applause.]

LOCATION AND CONSTRUCTION OF ROADS.

By Prof. W. M. Patton, *Chair of Civil Engineering, Virginia Polytechnic Institute, Blacksburg, Va.*

This subject of good roads is the most important and far-reaching one before the people of this country to-day. We hear a great deal about money to build these roads. We have already raised the money to build them in the last thirty years. At a low, conservative estimate, we have raised and spent on the roads of Virginia over $10,000,000, and the roads now are no better than they were thirty years ago. Now the question will be asked, Why is that the case? There has been no corruption, no stealing of that money. It has simply been the want of any uniform system,

the want of any directing head, and no great and important development can be made on any such basis as that. And if we go on for another thirty years we shall spend another $10,000,000 and have no better roads than we have now. The whole point, then, is the proper expenditure of our money. We have waited thirty years for good roads and yet we haven't them. We do not want to wait another thirty years. Therefore, we must do something in the way of raising a considerable amount of money and paying the interest on it wtthout any greater expenditure than we would otherwise incur for the bad roads we now have. We have to make a start somewhere, and in my judgment the start will have to be made by the counties, and that will in time be supplemented by State and National aid. It takes time to bring about these things, but, in my humble opinion, they will come in time.

Now, as to the question of what constitutes a good road: It ought to be smooth; it ought to give a foothold for your horses; it ought to be impervious to water; and it ought to be durable and present a good wearing surface. These constitute the elements of a good road so far as construction is concerned. But there are other elements equally important, and these elements involve the question of alignment and grade and the proper formation, draining, and rolling of your roadbed. It is a matter of small importance what you put on a roadbed unless you have good grades and good drainage and a good foundation. If the money expended in the last thirty years had been utilized in changing the location of our roads, and in changing the grades, it would have been spent to very good advantage, because now we would be in a position to put this covering on, which in many respects, is like the roof of a house, it being intended to shed the water. You can never have a good road if the water gets into it and remains there. It makes no difference what you pave it with, or how much money you spend on it, if the water gets to the foundation, you will never have a good road.

The questions of location and formation of the roadbed are the ones on which we must concentrate our efforts. There are very few roads in this country which were ever really located at all. They just "growed," as the saying is. They followed along boundary lines between properties; they went over the hills when they should have gone around them. So the first thing to do is to aim at putting the location along the best line. We can not consider alignment without considering the grade; the two must be considered together. If you go around a hill, you can go around it on a level; if you go over it, you must go up a more or less steep slope. In loading teams, you have to load, not for the level portions of the road, but for the slopes. For one single excessive grade on a long line of road determines what load a team of horses may haul. Take, for example, a grade known as the "angle of repose"—that is, the grade upon which a vehicle would just be on the point of rolling down itself; on that grade a team must expend double the energy to draw a given load which would be necessary on a level; or, what is equivalent to the same thing, no more energy would be required to haul a given load two miles on a level road than would be necessary for one mile on this particular grade. That principle should be kept in mind in determining the grade on any road. Animals can exert about double their average effort for short periods of time, but on long grades they can not do this. A grade of 3 to 5 per cent on a road is not excessive, but on many of our roads the grades attain to 15 and even 20 per cent.

After properly locating the road and establishing proper grades, the roadbed should be properly formed. It should be crowned or sloped slightly toward the sides so as to shed the water freely to the side ditches. Then proper side ditches should be formed and the bed should be properly rolled. When that is done, we should have a dirt road which will be good during a large part of the year, and which can be paved at any subsequent time. Now after that the putting on of the gravel or broken stone follows. Gravel makes an excellent road. It is constructed in the same way as a macadam road—by putting down a layer and rolling that

thoroughly, then putting on another layer and rolling again. But in the case of clay roads we must provide for drainage under the road, because it will be impossible to make macadam roads on a large scale impervious to water. Some water must go through and we must put proper drains in so that the water will be carried off.

But there is no use of building good roads unless you are going to take care of them after you have built them. The only way to take care of a road is to give it constant attention, not let it get so bad that repairs practically amount to a renewal. The cost of continuous care of a road is less than the cost of waiting for several years to repair it. There should be a constant effort to attend to the small defects as they occur, and even a good dirt road, properly drained and crowned and packed, if taken care of, will constitute a good road for a large part of the year.

Any road built of soft yielding material will, sooner or later, cut through under heavy loads on narrow tires. We should use the broad tires and longer rear axles. On our country roads there is a great advantage in broad tires, because they roll the road rather than cut through. They are regarded as road makers rather than road destroyers. The wheels of a vehicle should be as large as practical. Large wheels do less damage than small wheels. The larger the wheels and the smaller the axle the less the resistance to be overcome, and the less the work to overcome this resistance.

The idea has been presented that something must be done by the State to give us proper aid in this matter of road improvement. Of course we can build roads for $2,000 a mile, but the average macadam road is going to cost you $2,500 a mile if it is properly constructed. You can not build a good road for less than that. We can build fairly good roads for less, and with convict labor we can materially reduce the expense, but we must expect that good broad roads leading from our county seats or important centers will cost some money.

Another great mistake commonly made in building roads is to put the macadam on too thin. If the macadam or the gravel is put on too thin, the road will be cut through with narrow tires, and the moment the paving is cut, the road will go to pieces. The covering should not be less than 9 inches after rolling, and this means 12 inches before rolling.

Since I attended the road convention at Danville, we have appropriated $16,000 to improve the road from Christiansburg to Blacksburg—a road that has really become impassable during this past month. We saw the results of the very bad roads during the winter. In going over the country meeting people, I find, as a result of this agitation, that every one is beginning to inquire about this thing, asking what it means, what it is proposed to do, and the like. Wherever you people interested in good roads have been, we can hope to accomplish something. I am satisfied that the people are being aroused to the importance and to the necessity of good roads, and that it will not be long before we can have them. But, as has been said, we must get out of this notion that every road in the country must be improved at the same time. Somebody must determine what roads shall be improved first. You can learn a lesson from the way things are done in the cities. How could they pave the streets if every property owner in the city demanded his proportionate share of the money annually to pave in front of his door? The council orders that certain streets be paved each year because it is better for the whole community. Give your whole county the benefit of certain improved roads, and in time the advantage will extend to every one else. This is the principle which must be acted on. We must build out from some common center, say from the county seat, and keep going as fast as we can.

A good system of highways is vastly better than any system of branch railways as feeders to a trunk line railway, and I believe that the railroad companies are beginning to recognize that fact. All of these companies are taking great interest in this matter of good highways, and I am satisfied that they will, in time, cooperate with the counties and people in securing good highways. A good highway 15 or 20 miles

long can be traveled over rapidly and easily. In Kentucky I was stationed at Frankfort while important railroad work was in progress at Georgetown some 15 miles away. I could take a team at Frankfort any day in the year, winter or summer, and, after a fairly early breakfast, could drive to Georgetown, put in a full day's work, and get back to my office in Frankfort in time for supper, putting in as good and as fair a day's work as I would have done had I lived in Georgetown. The horse can stand it and can travel the distance in an hour and a half or two hours, whereas it takes all day long to go 15 miles over dirt roads, if you can travel at all.

I am sure, when the people begin to think about these things and realize the great benefits they are going to reap from good roads, there will be little trouble in getting the means to build the roads. The money will be forthcoming without any trouble.

I want to close by saying that a number of times I have known of parties coming into Virginia to buy lands, and having ridden over our roads, they would not buy property under any circumstances. [Applause.]

At the afternoon session, Thursday, April 3, 1902, the convention was called to order by Dr. W. C. N. Randolph, grandson of Thomas Jefferson. Dr. Randolph introduced Hon. J. H. Brigham, Assistant Secretary of Agriculture, who spoke as follows:

GOVERNMENT AID IN HIGHWAY IMPROVEMENT.

By Hon. J. H. Brigham, *Assistant Secretary of Agriculture.*

I regret to state that, owing to sickness in his family, the Secretary of Agriculture felt that he could not be with you to-day. He is very deeply interested in the work that you have in hand, realizing that it is one of the most important works now being considered in this country. Agriculture must ever be the most important industry of the United States of America. It is true we have many and varied interests, but they all depend upon this foundation industry of agriculture. [Applause.] We came down to-day on a magnificent railway train, passing through your country. It represents wealth and influence and power; but it depends almost entirely upon the men who till the soil for its prosperity and its wealth. We might survive the loss of some of the professions: If the doctors should refuse to visit us on a sick bed some of us might manage to die without their help [laughter]; if the lawyers should refuse to undertake the settlement of our difficulties, we might possibly get along in a peaceful sort of way without their assistance; the manufacturers fill a very important place in this country, and yet we could survive the loss of the manufacturer and the merchant—not that we wish to do it; but if the farmer should refuse to till the soil for a few short months in the year the world would be brought to the verge of starvation. So we who are connected with the United States Department of Agriculture feel and believe that we are doing the most important and valuable work done by any of the Departments of the National Government. [Applause.]

We have in mind plans to devise ways and to discover means to restore the fertility of the soil where it has been lost; to teach people how to retain the fertility, how to add to it, how to grow better crops at less cost. We want to help them in practical ways that they may realize profit in tilling the soil Too many of the young men are leaving the farm and going to the city, entering professions already overcrowded, because they believe there is no profit in labor expended upon the farm. We believe this is a mistake. We are certain that the time is not far distant when the ambitious boy who is willing to work and to use his intellect in his profession, that of agriculture, will be as prosperous as those engaged in any other calling. [Applause.]

But the real work and purpose of this convention gathered here to-day is to discuss the subject of good roads, a very important subject, and one that ought to come near to the heart of every farmer especially. One of the drawbacks to the farm, one of the things that has caused many to leave the farm, is the fact that we do not have good roads on which we can go with our produce to town at reasonable cost; we do not have good roads where we can go and meet with our fellows and enjoy social intercourse. I know what it is to enjoy (if you allow that term) bad roads. When a boy I settled in northwestern Ohio. We traveled along that magnificent road built by the United States Government, through the black swamp; on either side the water was from 18 inches to 2 feet deep on the level. There were a few log cabins built out there in the water, and the people had to lay logs from the roadway out to their cabins in order to get back and forth. Now there is the best country in the world right along that pike, and that is saying a great deal in addressing people here from the Shenandoah Valley and the fertile plains and valleys of other States. But that soil is rich, and they can work it in the springtime before they can work the gravelly soil or the sandy soil. They drained it and got rid of the surface water. But they had a time with the road question. It is easy to drain the surface water, but not so easy to build good roads where the material is lacking. I know after we left that Government road, we were frequently stuck in the mud, and had to unhitch to get through. And just before I landed at my little cabin where my home was to be for a few years, we got onto one of those "corduroy roads." There was no chinking, no dirt thrown upon it, and to travel over a mile or two of that kind of road would settle the best dinner you can find in the State of Virginia. It was a rough road to travel.

For years we lived in that country contending with the mud and these rough roads, but now we are improving the roads. We have found that we could do it. It was a problem that we thought a few years ago would never be solved. We knew we could draw off the water; we knew we had a rich soil; we knew we could send an augur down into the earth and tap springs of pure water; but we didn't see how we could construct roads that would enable us at any season of the year to go to market with our produce, to visit our friends, or the young men to go see their girls without having to put their pants in the tops of their rubber boots and wade through the mire. Now it is an awful thing for a young man to be so situated that he can not go to see his girl, for after he reaches her through the mud he can not do justice to the occasion. [Laughter.] I suppose some of these young men will understand that. We are getting out of this condition. We found when we commenced the work that if we would build up the proper grade, get rid of the water, round up the roads, and then put on top of the clay a thin layer of gravel, we could get good roads. We have some sand that is very bad in the summer time—6 inches deep at times—and to wallow through that is as bad as wallowing through the mud. Put a little clay on the sand and you have got a good summer road. The sand is all right by itself in the winter. Now all through that section of the country where the farmers thought a few years ago that we could not possibly afford to build these improved roads, they are anxiously waiting for the time to come when they can commence operations in their neighborhoods. One of the important things is to commence; go slowly; do not hurry; do not burden the people too heavily with taxation; but commence the work. You will learn something as you go along, and you will be surprised to see how the work will extend and expand. I think that is the history of every attempt to improve the public highway. Now the farmers—I do not blame them; I am a farmer myself, lived on a farm in Ohio until I moved to Washington—are opposed to heavy taxation; they are strenuously opposed to it, and indeed, can not afford heavy taxation. That was one of the objections they had to improving the roads when it was advocated by Gen. Roy Stone, and the bicycle men, who wanted good roads so they could glide along on their wheels without any trouble at any season of the year.

[At this point the speaker was interrupted by the entrance of several distinguished visitors, one of whom was General Miles, U. S. A.] We are all greatly honored by the presence of these gentlemen. We all have a great admiration for the warriors, the men who do the fighting of the country; but after all, they would not amount to much or have much to do if we did not have a country to fight for, and to take care of [applause]. And if they ever have to march out to battle—let us hope they may never have to again in this country [applause]—we do not want them to travel over the roads where they drown the mules that haul the wagons, as I have known it to happen more than once in war times.

I believe the farmer is unfairly burdened in the matter of taxation as a rule. And the objection on the part of the farmer that, under any system devised up to this time, he has to pay more than his fair proportion is well founded. I don't believe it is right. I believe that as every man who uses the highway is benefited by the improvement, the general public should share largely in the burden of expense in constructing these highways. I do not know just how the matter can be arranged. We have to work out this problem. If all property was returned equitably for taxation, if rich and poor bore their fair proportion of the expense, it would not be a very heavy burden upon anyone.

Now, the question is: Can the General Government help, and if so, how, in this work of improving the highways? I believe that the General Government can help. I am one of those who believe that it is always right for the strong arm of the Government to be extended to help her people in every section of this country. Now, we can not appropriate money without a limit, without due consideration, but I believe that it would be possible to make appropriations with such limitations and restrictions that great good can be done. The Government could appropriate a certain sum, to be supplemented by appropriations from State and county, and then ask the locality where the road is to be constructed to contribute a certain amount, and bring these funds all together. Then it would not be burdensome upon anyone, and the work would be started here, there, and everywhere, and in a few short years, without unduly burdening anybody, without impoverishing the Nation or the State, we would see good highways extending all over our land, beautifying the country, enriching the people, and adding to their intelligence and happiness in many ways. We want the postman to come and hunt up every farmer and his family living out on the farms of this country, and bring them the daily mail, keeping them in close touch not only with the affairs of this country, but of the world. You can not do this without these highways.

So I say we are in favor of proper legislation under which money will be wisely expended. Personally I am in favor of having the General Government, the State, the county, and the township cooperate intelligently in building these improved highways all over our country. We have a Good Roads Office in the Department of Agriculture. It should have a reasonable appropriation for the purpose of leading on in this work. I think we would all favor that, and I am sure this large assemblage of people here to-day shows that you have unusual interest in this question.

You have many distinguished citizens and your State has furnished this nation many distinguished statesmen. One of them, the most distinguished, resided in this immediate vicinity. We are to visit his home and learn something individually and personally of the surroundings where he lived. If you want to know something of a man or of a family, you want to go to the home where they live and you will get information that is reliable. You can not tell what a man is when he is out on dress parade with his silver-plated harness on. If you want to know a man, know just what he is, and what he is worth, how to measure him, you must know him in his home. So I am glad we are to have the privilege of visiting the home of one of the distinguished citizens, not of your State alone, but of the United States. [Applause.]

Now I want to demonstrate the fact that a tolerably long man can make a pretty

short speech when it is necessary, the shorter the better, sometimes. [Laughter.] I want to say in conclusion that we are willing, as a Department, through our Office of Public Road Inquiries, backed up by and sustained by the Secretary of Agriculture, to render you any assistance in our power in the effort to improve the highways of the grand old State of Virginia. [Great applause.]

General Lee (having resumed the chair). We are all very deeply gratified at the interest displayed in this good-roads movement, and I have no doubt that it will be attended with very beneficial results in the future, because we are just at the threshold of this subject. In fact, throughout the greater part of the United States the people are taking an interest for the first time in the good-roads movement. As we have quite a number of distinguished gentlemen here this afternoon, and as there will be a number of speeches, we are going to ask each one not to make too long a speech, because we want to get them up to Monticello this afternoon to see the former home of Mr. Jefferson, and to witness the progress that is being made on this memorial road. We shall vary the programme a little. We want a speech from the governor who commands our State forces; and we want a speech from the General Commanding the Armies of the United States. We also have two very distinguished railroad men here in our midst. Yesterday we had the president of the Illinois Central; to-day we have the presidents of the two great railroads that cross here, bringing the people from every section right through your town. And I want all of you people here in this vicinity to know Mr. Spencer and Mr. Stevens better, because we are going after them pretty soon for a great big union depot here in your town of Charlottesville. We don't want to have one of those splendid trains stop way down there, and another over yonder in the opposite direction in a great and growing city like this. [Applause and laughter.] We want a big central station, and I think, if you treat these presidents properly and listen to what they have to say, that the station will be the next move after we get the good-roads idea firmly established.

I now take pleasure in presenting Governor A. J. Montague. [Great applause.] Very likely you have heard him before. He is one of those gentlemen who are very greatly interested in this good-roads movement. He believes as I do that, if the railroads are the arteries of the State, then good roads are the veins, and he was especially invited here to-day on account of his interest in this subject.

HOW TO SECURE GOOD ROADS.

By Hon. A. J. Montague, *Governor of Virginia.*

General Lee requested me to extend a welcome to those of you who reside beyond the State. It is difficult to put in fitting phrase a real welcome. Hospitality can better be shown by deed than word. However, we are very glad to have you with us; glad to have your cooperation in an enterprise of such merit and magnitude as

that which brings you together, and which is now enlisting the sympathies and thought of the people of the State.

I arise to say a word upon the subject of public roads. The people, and the people alone, can secure good roads. We will not have good roads unless the people make the legislatures pass proper and efficient laws. [Applause.] I want to say that I yield to no executive in the country in my purpose and desire to attach my signature of approval to a good-roads bill of some character. Proper legislation is not always gotten in a day, and after such legislation good roads are not made in a day. It takes time. What we need to do in Virginia is to start the enterprise. Build a few miles of good roads in every county in the Commonwealth and then the road question will take care of itself by its own momentum. I know of no country on either side of the Atlantic that has ever abandoned the improvement of the public highways after once enjoying the benefits and profits of good roads.

We Virginians have very little infusion of outside stock. We are pretty hidebound in our Anglo-Saxonism and we seem to inherit the antipathy of our ancestors for good roads. [Laughter.] We should remember that the good-roads movement of England has practically accomplished its great work since 1826. From the time the Roman armies built the good roads through the county of York, in England, up to the year 1826, the English stayed in the mud in the winter and dust in the summer. Therefore, it seems that we have an inherited opposition to good roads. Yet the good-roads movement of that country, in the short time of its existence, has revolutionized the domestic and economic life of that people.

The idea is somewhat prevalent that railroads are substitutes for good public highways; but the railroad does not run by the door of every farmer, nor the store of every merchant, nor the home of every villager. The railroad can not replace the highway, which is the primal system of transportation; for as far back as one can go, we have the agriculturist in the field and the man at the market place desirous of buying that which the agriculturist raised, and to get from the farm to the market-house the public highway was essential. And to police the public highway and to enforce the bargain made between the man in the field and the man in the market place, some system of jurisprudence is likewise essential. Therefore, coeval with civilization has been the farmer, the market place or town, the highway connecting the two, and some system of jurisprudence enforcing the cooperation of these two factors of economic life. No matter how long we may live or how rapidly our civilization may grow and take on new forms, it will never outgrow or relieve itself of the necessity of public highways.

May I ask those of Virginia who are assembled here to-day what we have done in this State for the promotion of the public highways? We are expending something over $500,000 per annum for our public roads. In the past few days I have approved, as executive of the State, a number of bills in which counties have been given the right to bond themselves for road construction and improvement. I beg to accentuate the statement that though we raise a sum for our roads equal to that derived by taxation in New York, yet, unless this sum is expended in pursuance of some intelligent design and scientific supervision, we have wasted it. Such design and such supervision has been lacking in this State. I am not an old man, yet within my experience it is doubtful if the roads of this State have grown any better. How, then, are we to achieve road improvement? How can we lift this social and industrial blockade that keeps us from church and stands in the way of public education? For the bad winter months reduce the attendance in our public schools most lamentably.

First, let us have some intelligent design and practical scientific supervision; and to this end we should have a road engineer or a road commission, or both, with sufficient authority. Take the commission and the engineer out of politics and never

let them get into politics. It might not be unwise for some of the professors of our colleges to select a man or a commission who can build a highway cheaply, honestly, and expeditiously. It is as useless to attempt to save money by the construction of a house without an architect or mechanic as it is to appropriate money for the building of roads without some commission or competent authority to design and supervise.

Of course money must be had. There are several ways to obtain this. Bonds can be issued by the counties, or the system of New Jersey and other States—which is known as the State-aid plan—may be adopted. Under this plan an appropriation is made by the State, conditioned upon a supplementary appropriation by the county, which in turn is conditioned upon a supervision by the State of the expenditure of the whole sum for the maintenance and construction of roadways. By this system of cooperation the State can properly assert her authority for the supervision of expenditure and work.

We should not, however, overlook National aid. I believe this in time will come. The so-called constitutional barrier against National appropriation must fall to the ground. The National Government has constructed public highways unopposed by the strictest constructionist of the Federal Constitution. Moreover, if the National Government can appropriate money to build harbors and to irrigate lands of the States, how much greater is the reason and the right for National aid to public highways, the primal and abiding factors of transportation, both local and interstate.

Recurring, however, to State and county aid—after much investigation and observation, I affirm that no county has ever expended its money in the construction of public highways, if intelligently and honestly supervised, that had to increase the rate of taxation either to meet the interest or to pay the principal on the maturity of bonds. [Applause.] I repeat that the most hopeful feature in the solution of the good-roads problem is that the improvement of our roads in turn so enhances the value of adjacent property that the same tax rate will yield sufficient revenue to meet the interest and principal expended in making the improvement.

I wish to advert to another feature in the construction and maintenance of our public highways in this State. I hope not to offend the sensibilities of anyone when I say that out of 1,400 convicts we should utilize some of them in constructing and maintaining the public roads of this State. [Prolonged applause.] If we can not successfully put these convicts upon the public highways, can we not at least employ them in the preparation of road materials? Can we not utilize this labor for the benefit of the present and the future as well? A people are responsible, not for what they have done, but for what they can do; not for past achievements, but for what they can achieve. The people of this Commonwealth can not rest upon the memories of their great men nor solace themselves with the glories and traditions of past deeds. These glories and these traditions should be a stimulus to better things.

We are gathered here to-day to inaugurate a memorial in the form of a public highway to Mr. Jefferson, one of the most remarkable men America ever produced [applause], perhaps the most scholarly, learned, and philosophic thinker upon governmental questions that ever lived. Writing to James Ross, he said:

I experience great satisfaction at seeing my country proceed to facilitate intercommunications of several parts by opening rivers, canals, and roads. How much more rational is this disposition of public money than that of waging war.

Again, he says in a letter to Humboldt that it is more remunerative, splendid, and noble for people to spend money in canals and roads that will build and promote social intercourse and commercial facilities than to expend it in armies and navies.

Therefore, no place and no name can be secured, more properly suggesting the needs and benefits of good roads, than that of Mr. Jefferson.

The people of Virginia should consider this road question, and, after consideration by mass meetings and at nominating conventions, they should instruct every man who

is a candidate for a seat in the general assembly to support a good roads measure. The instant the people show the legislator that their vote is needed to elect him he will be responsive to their demands. Public enterprises of this sort must move slowly, but in this Commonwealth they have been moving slowly long enough. I beg you to cooperate with your neighbors and friends to the end of securing the influence and the aid of him who represents you in the general assembly in the passage of such laws as will give this State the unspeakable aid and blessing of good public highways. [Great applause].

Chairman Lee. We have here the General Commanding the armies of the United States. It is a most honorable position, and it is a very great satisfaction to us all to find a gentleman occupying that eminent position who takes an interest in the public policy of the counties, cities, and States in our Union. The question of good roads may become momentous even to our friend General Miles, because one of these days it is possible we may get into war with a great nation, and we shall want good roads to move our soldiers and artillery out to our borders, and possibly to move them back again in case of any little trouble at the front. [Laughter.] General Miles has had great experience in all that work. He knows how to build an Indian path; he knows how to make a wigwam; and he knows how to build roads on which to move troops and supplies. I know I represent the sentiment of the people here to-day when I bid him welcome to Charlottesville and to the county of Albemarle. [Great applause.]

IMPORTANCE OF GOOD ROADS IN WAR AND PEACE.

By General Miles, *Lieutenant-General of the United States Army.*

I am gratified to be with you on this occasion and to enjoy a day of pleasure and recreation and rest from the duties and cares and anxieties and perplexities and responsibilities of life at the Capitol. I am delighted to come out into this beautiful country, to breathe again the pure air of Virginia and find myself here in this beautiful country on this spring day. In fact I may say that I always loved Virginia, for I remember a long time ago, myself and some companions struggled for four long years to see more of your country. We tried to get down here in this part of the country, but we encountered two almost insurmountable obstacles. One was the wretched condition of your roads, especially at a certain season of the year. I remember they were almost impassable for horses, mules, or wagons, or for those of us who were walking. It was almost impossible to make any progress, for the oftener we put down our feet the more of your real estate we took up.

And then we encountered another obstacle. There seemed to be a certain prejudice against strangers [laughter], especially those coming from the section from which we came. I thought the people of Virginia at that time were the most exclusive people I ever saw.

But notwithstanding that great contest, in which Americans were pitted against Americans, finally the mantle of peace was spread over the great theater of war and left a feeling of respect and admiration for the courage and fortitude and sacrifices of these Americans contending for what they believed to be right; and I rejoice to-day to meet here, in this delightful part of Virginia, a body of Americans interested in one of the noblest enterprises that can attract the attention of Americans, and also

to find here representatives from different States in the United States interested in the same great enterprise.

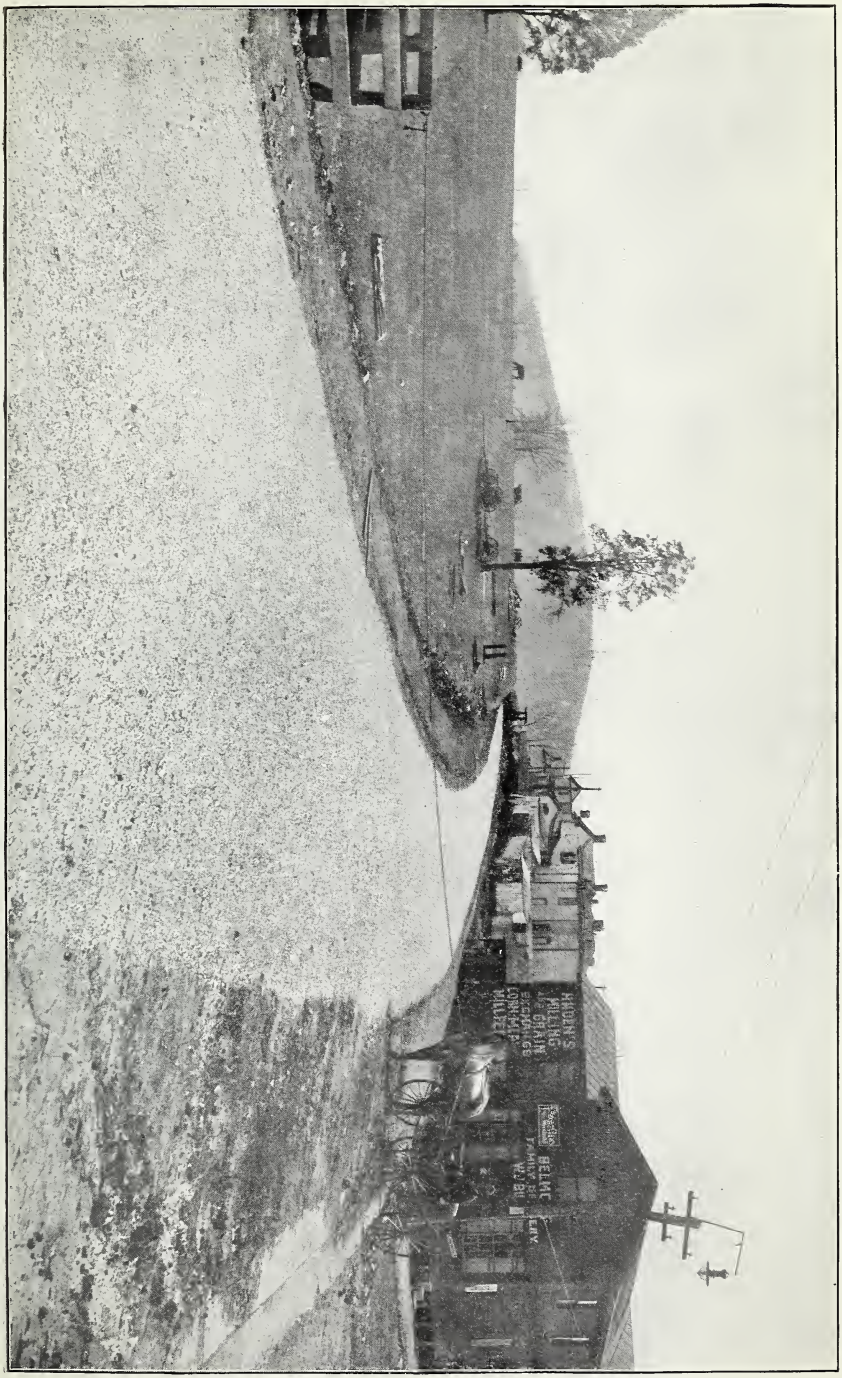
No more fitting place could be found for a convention of this character than here, at the home of one of Virginia's most prominent statesmen, a man who did so much to block out and frame the great Constitution, the great principle of government which we all enjoy, which our fathers before us enjoyed, and which we hope to transmit to our children and our children's children. [Applause.] Not only was that one of his great works, but he contributed largely to acquiring that invaluable western section of the country that is now a part of our national domain. It was through his wisdom and statesmanship that we are now enabled to look upon that section as our own, and one of the most important parts of the United States. It is also quite fitting that this convention should assemble here near the birthplace of two of the greatest explorers and pioneers that our country has produced; those two men, who under the direction of Jefferson, paved the way of civilization across the continent. I refer to Lewis and Clarke. [Applause.]

It is the explorer and the pioneer that studies the trend of the mountains, the currents of the rivers, the topography of the country, and blocks it out and maps it. Then follow the saddle routes and the rude roads of the pioneer and the home builder. These are followed by the more extensive and more important lines of communication and commerce, and finally there has been built up a system of railways exceeding anything that is known on the globe. We excel all countries in that respect, and our wonderful system of railways probably almost equals those of all other countries combined. Capital, genius, and enterprise have been devoted to building these great lines of communication. Now it is important to turn the attention of our people to improving the roads that are feeders to these great trunk lines. It is estimated that at least 95 per cent of products have to be moved over the common roads before they reach the railroads or the lines of steamboat communication.

The United States Government has appropriated $480,000,000 for rivers and harbors during the last seventy-two years, and only about $8,000,000 for the improvement of the country roads. Now it appears to us that it is a fitting time to draw the attention, not only of the people that are immediately interested, but of your representatives, both in the United States and the State legislative bodies, because it is one of the projects that is bound to contribute to your welfare and happiness. If there is one thing that indicates the intelligence and civilization of a people it is their means of communication. We find in the ancient cities of the old countries, such as Greece and Rome, the roads there indicate the high intelligence of those people.

I shall not undertake to go into the subject of road making, or what the advantages of it may be to this audience. All that can be much better explained by gentlemen who have preceded me and who may follow me, but yet I will say that I do not know of any question that has been so much neglected, or that is entitled to more consideration than this. The safety, the welfare, and the perpetuity of our Republic of eighty millions of people depend largely upon the intelligence of its citizens, and there is no one thing that contributes more to the intelligence and patriotism of a nation than the communication and dissemination of intelligence through the postal department of our Government. It brings the daily intelligence of the world, it brings to your door the history day by day of the affairs, not only of your own country, but of the entire world; it brings to your door the modern literature, the books and periodicals of the world; it brings to you business communication that is so important for an intelligent, enterprising country. Now it is believed that some measure can be adopted by which to promote the construction of better public roads, and thus postal communication and commerce may be still more and more improved.

I thank you for the opportunity of being with you, and wish you all prosperity and happiness. [Applause.]



SECTION OF JEFFERSON MEMORIAL ROAD, COMPLETED.

CHAIRMAN LEE. It has been well said that the railroads of our country are very intimately connected with our public highways. We have here on the platform one of the most distinguished presidents of one of the greatest railroads in the United States. It is not a tri-weekly line; it is not a "narrow-gauge," but it is a big road, connecting the North with the South. I have no doubt you have all heard of this gentleman, but may be many of you have not seen him, because he is a man that works all the time and he has not a great many leisure moments; but I know you will recognize his name, and I take pleasure in introducing to you Mr. Spencer, the president of the Southern Railway Company. [Applause.]

THE ROADS AND THE RAILROADS.

By SAMUEL SPENCER, *President of the Southern Railway Company.*

I did not know until our distinguished chairman this morning made his opening remarks why I was invited to be present. I now know that it was a union station at Charlottesville. [Laughter and applause.] It is only necessary now to add in that connection that I did not come prepared on that subject. I felt, however, a sincere pleasure in anticipation of being here again. It is the second time, or, possibly, the third, that I have stopped at Charlottesville for more than an hour since I left the walls of your honored university [applause] thirty-three years ago.

The enterprise with which I now happen to be associated, and have been for several years, has grown to be one of some importance in your State and throughout almost every State south of the Ohio River and the Potomac. In connection with that work I have thought a great deal about what is desirable and necessary for the development of the section of country to which I owe my birth as well as my education, and my thoughts have naturally turned to the question of her highways.

As our chairman has so aptly said, the railways of the country are its arteries, the roads its veins. That relationship must be apparent in many ways to anyone devoting his time and attention, as I have, to the building up or the management of those arteries. The occasion of your convention to-day grows in a measure out of an invitation extended by me last July to the National Good Roads Association to inaugurate a movement by means of a good-roads train that should furnish an object lesson to everyone in the Southern States of good-road building.

The movement of that train I hope has done some good. At all events, so far as my observation goes, it has attracted some attention, and in some cases aroused enthusiasm for an improvement which I regard as the most important one now before us in the development of the South and of the whole country. The work of this train is now in its last stage. It has completed 4,000 miles of an itinerary through 6 States; has built, or been the means of building, 14 or 15 sample or specimen highways, adapted to particular sections in which the work was done, and therefore of the highest value to that section as an object lesson of what could be done by the people. Nothing could be more appropriate than that the last work of this venture should be the construction of a highway from the University of Virginia to the historic home of Jefferson at Monticello. [Applause.]

Without detaining you by discussing the importance of the highway as an adjunct to the civilization, the progress, and the wealth of any country, I wish to say, as your distinguished governor has pointed out, it is an economic question; it is not a question of sentiment; it is a question of real benefit and progress; and, while there is

abundant explanation for the fact, it is none the less true that in the improvement of the highways alone America has lagged behind in the progress of civilization. It is not too much to say that there is not a great power in the world to-day that is not in advance of the United States in the general average conditions of its highways. Every European State of importance has her good roads to a greater or less extent, and to greater extent relatively than we have. You find this the case from Norway to Italy. The reason is very simple. The vigorous growth of the United States began almost at the same time as the advent of the locomotive. The United States, by reason of the losses suffered during the war of the revolution, and again after the depletion of her resources by the war of 1812, had not made much progress until late in the twenties, and with that period came the locomotive. America almost immediately stepped to the front in the development of her railways, and to-day, as General Miles has already said, she leads the world in that particular branch of industry, as now she is going to do in so many others. The railway was considered the highway in America.

Every suggestion of improvement in transportation facilities took one of two forms—the improvement of the waterways or the improvement of the railways. The highways were neglected and forgotten, until now, the railway system having approached a state of sufficiency for the needs of the country, and the railways having been put in a more perfect condition, all things considered, than any railways of the world, having developed an economy of transportation that no other country in the world ever enjoyed, naturally the American people are turning their attention to-day to the related question of the improvement of her highways. It has come late, but we may rest assured that the American people will address themselves to that subject with the same force, the same vigor, the same liberality, and the same resource and ingenuity which have characterized them in everything they have done. [Great applause.] Therefore, the subject of good roads has now developed in the United States into a real, a potent, a National question. And one of the leading necessities in inaugurating that movement has been to acquaint the people at large with what can be done and what has been done, to show them not only by literature, by addresses, and by arguments, but by practical lessons, actual demonstrations, what is necessary to make a highway, how to do it, and what its benefits will be.

The science of transportation has been developed in an inverse way in the United States. We are turning back and taking up the very elements, because the transportation on the highway is the elemental transportation of the entire earth. The farmer is engaged in transportation just as the railway is, though not of course to the same extent. He has to perform the first part; the second part comes to the railway. The development of economic transportation by the railways in America has reached a point where the charge for carrying freight is only an average of a little over a half cent for every ton moved a mile. The farmer who brings his crop to the nearest station for shipment, or to the market where he disposes of it without shipment, pays ten, twenty, a hundred times that amount. Therefore, one of the fundamental problems in benefiting the farmer is to cheapen that portion of the transportation in which he himself is engaged. And the chief purpose of the recent tour on the Southern Railway has been to show that cheaper transportation was available and ought to be utilized between every farmer's door and his nearest station or market. I know of no better way to bring that question home, and I hope in a measure it has been done.

A farmer hauls with a wagon a load of half a ton. He hauls it 10 miles. His team for the day on a fair road can make a round trip. Suppose the value of the service is $2 or $3 a day. He has hauled half a ton 10 miles, which is equivalent to one ton 5 miles, and he has spent $2.50. He has paid 50 cents per ton per mile in the crude transportation in which he is engaged. The railway takes that ton of freight at the nearest station and carries it to almost any point that the farmer desires at one-fiftieth or one-hundredth of the rate which he paid for this work. The science

of transportation is developed in one case; it is totally undeveloped in the other. Now, it goes without saying that if he can haul two tons over the road between his house and the station with the same team, the same wagon, the same driver, with which he formerly hauled one-half ton, his expense is reduced to one-fourth. His income is increased. If his farm is offered for sale, it commands a higher price because the product is worth more, and the entire country at large must necessarily be benefited. I thank you for your attention, and I hope that the enterprise upon which you are now engaged will meet with all the success which it ought to have and which you expect. [Applause and cheers.]

Chairman Lee. We have on this platform the president of another very large and flourishing railroad company. You may see his trains going by here at any hour of the night or day. I am going to introduce to you Mr. George W. Stevens, president of the Chesapeake and Ohio Railroad Company. [Applause.]

Mr. Stevens. I did not expect to be called upon to address this audience; in fact I did not know that I was coming to this hall until I arrived in the city, therefore I made no preparation whatever to address you on this very important topic. I can simply say that I am heartily in favor of the good-roads movement, and any community served by the Chesapeake and Ohio can be assured of my heartiest cooperation. [Applause.]

Chairman Lee. Mr. Stevens's modesty is equal to his ability. You notice he never said anything about a union station. They will have to come up to it you know, because we are progressing now.

Telegrams of regret at not being present were read from Hon. John W. Daniel, United States Senator, Hon. John Hay, Secretary of State, and Rear-Admiral Winfield Scott Schley.

A committee on resolutions was appointed by the chairman consisting of the following: C. P. Shaw, chairman, C. E. Vawter, John W. Goss, and George Perkins.

THIRD DAY—FRIDAY, APRIL 4, 1902.

THE IMPROVEMENT OF OUR HIGHWAYS.

By W. L. Dickinson, *President Connecticut Valley Highway Association, Springfield, Mass.*

The construction and maintenance of our roadways is before the American people to-day as never before in the history of this country. The people realize the importance of excellent roads, and their value to all our industries. The saving made on the wear and tear of our horses and vehicles, the heavy loads that can be hauled with a less number of horses on a good road as compared with a poor road, the saving made by business men in the difference in time it takes to ride over a good road and a poor one, are all points which show the need of having first-class roads. Good roads are a standing advertisement for the community in which they are built, making the city or town a desirable one in which to reside, helping thus to increase the population and taxable property. A stranger's impression of a city or town depends largely on the character of the roads.

Communities located on poor and isolated roads can take no successful part in competition with others located on good thoroughfares and having the advantage of prompt and regular communication with the markets at all times. Give to an

isolated community good substantial roads and they will do more toward bringing about a general prosperity than will any other reform that can be introduced.

A road, like every piece of human work, is bad or good just in proportion to the amount of sense and ingenuity that has been shown in its construction and maintenance. Every well-built road is a testimonial to its maker's intellect.

The problem of good roads is a very serious one, and it will be many years before it will be solved to the satisfaction of the public. However, we must all put our shoulders to the wheel and accomplish all the good possible. We should profit by the experience of others, and adapt ourselves to the means at our disposal, and to the conditions that exist in the different localities.

We must make a thorough investigation for local deposits of road material and test their value by actual use. Oftentimes a mixture of different materials will accomplish good results. Proper drainage should be secured wherever necessary, as standing water is an injury to any road.

In the construction of roads the fact must be kept prominently to the front that it is economy in the long run to build in the most thorough and substantial manner, using the most approved and up-to-date methods.

We must have systematic work. A plan should be adopted in every State, city, and town, and at least a portion of it carried out each year. The various road materials should only be used in their proper place according to the conditions that exist in the different localities. The weight of the traffic and the width of the road are points that must be considered.

A proper system of maintenance should be adopted, as you can not have good roads without it. Whatever material you use, the road will in time need careful repairs by men skilled in this work. The old adage, "A stitch in time saves nine," applies here with more than ordinary force.

Where the traffic is light good results can be obtained from a gravel road properly constructed and maintained, but on a country road where the travel is above the average it is necessary to use a more durable material.

In some sections of the country there is an absence of good road material. Even under these conditions the roads can be improved greatly by securing good drainage and by grading the road properly. Then a frequent smoothing up of the surface, filling the ruts with good material will keep the road in fair condition during the summer months.

In order that the users of the roads may derive the greatest benefits, the improved roads should be built in continuous lines, leading in various directions from the important centers of trade on the main arteries of travel.

A perfectly good road must have a firm and unyielding foundation, good drainage, hard and compact surface, the surface neither flat enough to allow water to stand nor convex enough to be inconvenient to the traffic.

In regard to the best practice in macadam road building there is a difference of opinion. The quality of the rock used has much to do with the value of the road when completed. The stone should be uniform in texture. The soft stone should not be mixed with the hard because it will disintegrate and wear out quicker, leaving the road surface uneven and full of holes. It is economy to use the best of trap rock even if it costs the most.

A solid, dry foundation must be obtained by draining where necessary and by the removal of clay or any improper material or vegetable matter. The foundation should be thoroughly rolled with a steam roller and graded to a curvature to conform to the final surface of the road when finished.

MACADAM ROADS.

There are many methods in use for building macadam roads. Among these are Telford foundation, and crushed stone in various depths. Some have a total thick-

ness of 8 inches in two layers with ¾-inch stone and screenings spread in uniform layers over the coarser stone for the purpose of filling the voids, all being thoroughly rolled with a steam roller. Water is applied in such quantities and in such a manner as to completely fill all the voids between the broken stone with the binding material saturated so as to secure a perfect bond. The roller should work from the side lines of the stone bed toward the center. Other roads have the voids filled with sharp sand carefully worked in with a broom. Another form consists in placing crushed stone, 2 or 2½ inches in size, with ¾-inch stone and screenings on the top as a binder.

Where a light macadam road is required, one layer of 2½-inch stone is placed on a very carefully prepared foundation and rolled in such a manner that this layer of stone will be thoroughly angled together. On top of this a layer of 1½-inch stone is placed and, after being well rolled, a binder of sandy loam and screenings is placed and water applied in such quantities and in such a manner as to completely fill all the interstices. The rolling is continued until the whole mass is brought to a solid bearing.

BITUMINOUS MACADAM.

By the use of carefully and scientifically prepared bituminous cements, skillfully mixed with crushed stone, under the direction of men who have had years of practical experience in handling bituminous materials suitable for street pavements, a great improvement is made over the ordinary method employed in constructing macadam roads.

The advantages of bituminous macadam properly constructed are its durability, its being impervious to water, frost-proof in winter, and preventing mud, dust, and loose stones in summer. It makes a clean, comparatively noiseless and attractive roadway. While the ordinary macadam road in general use in this country soon wears badly under traffic, making mud or dust, and soon allows the stones to loosen, a bituminous macadam road is waterproof. It does not absorb the filth of the street, and prevents the washing by heavy rains to which the ordinary macadam road is subject.

Good and uniform results can not be obtained by the use of common coal tar obtained from gas works in different sections of the country. In fact, it is impossible to secure a bituminous cement from the products of the average gas works which will produce good results. The construction of this form of roadway demands the services of experts in this line of work. Expert road builders pronounce this the most progressive, economical, and up-to-date method that has been devised.

The crown of a road when finished may vary on different roads, or even on different grades of the same road, from one-half inch to 1 inch to the foot. Of course, no inflexible rule can be given for the width, crown, thickness, or cost of a road until the requirements of that particular road are known.

Where the travel is light a good road can be built with 6 inches of gravel and a light coat of crushed stone placed on top.

GRAVEL ROADS.

Gravel roads can be built in many ways. The best is made from gravel that has been screened and placed on a prepared roadbed, similar to that used for macadam roads, with the larger stone at the bottom and the smaller size used on the top for a binder. Exclude the stones that are too large.

Where the gravel is not good enough to pay for screening a good road can be built by placing the gravel on the road in two layers. These layers must be thoroughly harrowed and rolled with a two-ton sectional roller until thoroughly consolidated and firm. With some varieties of gravel a good road can be built without the use of a roller, allowing the travel to consolidate the gravel. The wheel tracks must be

continually filled in. In all cases prepare the foundation in a similar manner to the foundation for a macadam road.

A constant and continuous system of repairs should be adopted on this class of roads as well as on all others.

MAINTENANCE.

The object of maintenance is to keep the roads in such a state that vehicles of all descriptions always find them in the best possible condition for travel. It is necessary, then, that it be directed in a way to remove at every turn every obstacle or source of resistance to travel, and to prevent or correct at the beginning all the impairments to which the roads are liable. This result can be obtained only by means of a constant watchfulness, and by the organization of resources constantly at hand in material and workmanship.

The secret of the excellent roads of Europe is good construction and the constant, systematic, and skillful method employed in the maintenance of roads. On these roads a force of skilled men is continually employed making repairs, and any defect, however slight, is immediately repaired. It is not considered that the necessity for continual repairs is an evidence of poor workmanship in the original construction, but rather that an earnest effort is being made to keep the roadways in perfect condition. This prompt and constant repairing explains the superior condition of the roadways of Europe. The men who have these repairs in charge are skilled in this line of work and hold their positions because they are thus qualified. Politics has nothing to do with them as it has in this country. These men are removed for neglect of duty only. It takes years to educate men in the art of road building and the proper method to be employed in making repairs. Generally, in this country, cities and towns pay for educating the men in charge of their roads, and then politics removes them; but time will make this matter right. It certainly will be made right when people find that it is the only way to have good roads. The trained road builder is just as necessary as the trained doctor, manufacturer, or educator.

In a great many towns you will find the road officials, once a year at least, at work with a road machine, taking the worn-out material which the water has washed from the road into the gutters and putting it back in the center of the road. This is wrong, because this material is worn out. It is soft, when dry it makes dust, and when wet it makes mud which holds the water, thus injuring the road. It is as necessary to keep a road clean as anything else. It lengthens the life of the road, and it should not be covered with this worn, loose, worthless dirt, whatever the the road may be.

In traveling over the country deep ruts may be found both where the horses and wheels travel. This would not be the case if a proper system of maintenance were employed. The roads can be maintained for a small sum of money, if promptly and properly attended to and with some diligence. For instance, if depressions are filled and not allowed to develop into deep ruts, it would be more comfortable to the traveler, and the water would not be held but would run off the surface of the road. Standing water is a detriment to any road. The very best built road will soon go to pieces unless it is kept constantly in repair just the same as a building.

One of the great economic issues of the day is the improvement of our highways. We can not afford to have poor roads, as the cost is excessive. The people appreciate this fact and are bringing pressure to bear on the National, State, and local governments to devise ways and means for the betterment of our roadways. This can not be done too quickly, as the annual loss by poor roads in this country is enormous.

The benefits derived from good roads have been fully demonstrated in States where they are progressive and have a large mileage of continuous lines of improved roads leading out in various directions from the main centers of trade. It is a fact that, in States where a proper policy has been pursued, the cost of the construction and maintenance of improved roads is nothing as compared with the great benefits

derived. With these facts before us, it is certainly advisable to improve our highways as soon as possible, using the most approved and up-to-date methods.

We should take advantage of the experience of men skilled in this work, and we would all be benefited by studying carefully the advice given by the most skillful road builder the world ever produced, John L. Macadam.

Without a doubt we shall have in a few years in this progressive and enterprising country the finest system of roads in the world.

REPORT OF COMMITTEE ON RESOLUTIONS.

The committee on resolutions submitted the following report, which was unanimously adopted:

Be it Resolved,

First. That the Jefferson Memorial and Interstate Convention heartily approves of the work being done in the cause of road reform by the Office of Public Road Inquiries, and in order to enlarge the sphere of its usefulness earnestly recommends to Congress that it be raised to a bureau, with an annual appropriation of at least $100,000.

Second. That it indorses the work of the National Good Roads Association for road improvement and recommends that all believers in that reform join the association, so as to make it a still more powerful factor in solving the most pressing problem in the development and civilization of our country.

Third. That it desires to assure the management of the Southern Railway of its appreciation of the broad-minded spirit which induced it to lend its aid at great expense in fitting out and transporting the good-roads special train throughout the South with a view to awakening an interest in this great economic movement.

Fourth. That it extends its thanks to the Hon. A. J. Montague, governor of Virginia for his patriotic efforts to secure a good-road law for the State.

Fifth. That it expresses its deep regret that a good-road law was not passed at the last session of the legislature, and it urges all friends of road reform to work unceasingly until there shall be placed on the statute books a law which shall embody the features of the utilization in the construction of the public highways, or in the preparation of material therefor, of all short-term convicts, tramps, vagrants, and jail prisoners, all such work being under the supervision of skillful engineers.

Sixth. That it recommends that the State provide for instruction in road building at all State-aided institutions.

Seventh. That it recommends that all citizens shall urge their respective members of Congress to vote for an amendment to the interstate commerce act which shall prohibit the shipment from State to State of prison-made goods, and that all other efforts possible be made to diminish the competition between convict and free labor.

Eighth. That the convention recognizes as a fact that the only way in which convicts can be employed without competing with free labor is on those works of public utility whose great cost retards or prevents their being undertaken by free labor, such as the construction of highways and the preparation of the material therefor.

Ninth. That the convention recommends to all the various localities that desire to see in this generation even the beginning of permanent road improvement to utilize at once all their own resources and not defer action in the hope of Federal aid. The history of road improvement shows that when a good beginning has once been made the movement is sure to go forward to success.

Tenth. We extend our thanks to the management of the Chesapeake and Ohio, the Southern, and other railroads for favors extended and to the press of the country for their liberal, patriotic indorsement, and to the local committee and to all others who have contributed to the success of the enterprise.

PIONEER ROAD BUILDING—A HISTORICAL PAPER.

By Hon. Binger Hermann, *Commissioner of the General Land Office.*

At the outset I desire to express to you my sincere appreciation of the honor conferred upon me and the opportunity of having the pleasure of visiting this interesting and classical portion of the grand old Commonwealth of Virginia, and of meeting face to face so many of her distinguished citizens.

In this age of inventive genius, wonderful industrial development, and marvelous riches, and with a nation of people unexcelled for their energy, public spirit, and patriotism, incredible strides have been accomplished in almost every conceivable direction whereby the comforts and conveniences of all our people have been the happy result. Among these advances something has also been done in a few sections of our country looking to an improvement in our road systems. Various counties, and some States, have actively entered upon a campaign of education along these lines, and satisfactory results have ensued, and the good work still goes on; but in most of the States of the Union, however, a sad deficiency is manifest, and even the last century has not contributed for good roads the proportionate stimulus which it has conferred on other material and industrial development. There is a lack of uniformity in the road systems of the different counties and States, which varies as much as the condition of the numerous roadways themselves. Unless this is remedied there will continue to exist indefinitely an obstacle to improved facilities for road travel whereby permanent, continuous, and easy transit may be assured direct from one community to another.

To that individual or association which may achieve this success there will be due the lasting gratitude and the devout blessings of posterity. If I were possessed of the gift of prophecy, I should say that the hour of relief is near at hand.

It is not so much the construction of roads that is needed as it is the construction of good roads. As an economic proposition, it may be said that a bad road is decidedly more costly than a good road. If I were asked my opinion of any section of country, I should first desire to know as to the system and condition of its roadways. Communities are poor in proportion as they are remote from transportation facilities. Cheap transportation means freer competition, and freer competition forbids unjust combination. Good roads are the advance agents of prosperity as well as equality. Good roads mean good markets, and they also mean cheaper and quicker transit between the market place, the farm, and the factory. Good roads mean a larger margin of profit to the producer, and also an easier rate to the consumer. Good roads mean appreciation in land values. Good roads also encourage production and induce population and social advantages. Good roads invite improved vehicles and require less power. It is estimated that 15 cents per ton per mile represents the difference between the cost of transportation on first-class good roads and on the common country roads. By competent authority it has been estimated that 99 per cent of the entire roadway mileage of this country is practically unimproved so far as we may define good roads. If this be only partially true, the hour can not strike too soon for the people to awaken to the real situation which confronts them. The great railways have been liberally aided by our Government, and the waterways have received generous recognition also. Let the next problem be, "What shall we do for the people's roadways?"

It was my lot to have been one of the early pioneers in the country west of the Rocky Mountains and in the dense forests facing the waters of the Pacific Ocean. It was necessary that we cross the rugged Coast Range to penetrate the interior, first upon Indian trails and often along the well-beaten highway traversed by the elk, then so frequently seen upon the western confines of the Republic. Later on as the pioneer element increased we blazed out and established our own trails, following

easier gradients than those of our aboriginal neighbors. Thereafter followed the rude wagon road upon grades and curves still better, though often the vehicles were elevated and lowered over precipitous cliffs and lifted and carried around mountain slides. Even this, however, indicated an advanced stage in the pioneer settlement. The crosscut saw, the shovel, the pick, the grubbing hoe, the ax, and the handspike represented the implements in use. This, with the muscle and energy of the American pioneer, prepared the way from one country to another, and thence to the highway of the territory. Crude implements, scanty means, few neighbors, and general lack of skill and uniformity made progress slow. Even as population increased, and improved methods and more plentiful means were obtainable, there were yet missing the essential methods requisite for good roads.

Necessity is the mother of invention, it is said, and to the pioneer this same necessity is often a blessing in disguise. It enabled us to reach the most inaccessible places and to establish routes which at first seemed impossible. With fifty years' expenditure of labor and liberal contributions of money the roads continue crude, unsatisfactory, and costly to the people who use them. While the advances of improved methods are noticeable everywhere, yet with few exceptions the country at large still moves upon roadways discreditable in the fair weather of summer and almost impassable, and too often invisible, in the inclement season of winter.

The demonstration we witness here to-day is an impressive object lesson, and it, with others which have preceded it upon a smaller scale in some favored States in the South and West, indicates unmistakably that there is a quickening of the conscience of the people, not only in many counties and States, but that it is also invoking a National interest. Education is coming to the rescue; advanced methods and improved implements and machinery are being adopted; experiments upon new lines are being applied; and good roads are coming to gladden the twentieth century.

The project is so vast that, to be of uniform and efficient service throughout the various States, a greater aid than that heretofore supplied by voluntary contributions, individual labor, or by road-district, county, or State taxes is required. It is argued that the assistance of the National Government is indispensable, especially upon the principal routes of travel in the States and Territories; that a judicious system, carefully devised by eminent engineers and applied to the more important and necessary routes, as may be mutually agreed upon between the State and National authorities, should be adopted.

For years the Government has extended its generous attention to the improvement of the navigable waterways of the country in order that facilities for cheap transportation may be increased and improved, and it is claimed that Congress unjustly discriminates in failing to provide for the landways of the country. This is the reasoning which may later on have consideration in the National Legislature. It may be said partly in reply that the General Government has manifested a very generous disposition to our railways, and contributed some aid to wagon roads by grants of public lands through Congressional legislation. To railroads 197,000,000 acres have been granted, while to wagon roads 3,273,816 acres have been granted directly and indirectly to various corporations and States. These wagon-road grants, though affecting widely distant localities, were open to the serious objection that many of them in character and safeguard were grossly improvident, and were secured more for speculative purposes than for subserving the greatest possible good for the greatest possible number. Even where in good faith attempts have been made in later years to establish roadways as a result of the beneficence of the Government, the construction has been based upon a mistaken principle and upon incorrect and crude methods, and the instances are exceedingly rare where any one of such roadways has answered the real purpose for which it was intended, especially after the grantee had secured an approved title from the Government.

There is much in the criticism of the good-roads' advocates as to existing conditions, and much in their advocacy of National aid which should enlist the hearty sympathy of every good citizen. The careful and economic administration of National aid for National roadways exhibited by our forefathers should have been a more valuable lesson to those who legislated seventy years later. Should the Government again be induced to return to its former participation in good road construction, the most comprehensive system (practicable as well as uniform) should be adopted, and with such skillful directors as will be equal to the task, and who will consecrate their best endeavors to a conscientious performance of the public trust. In the early days of the Indian wars, in the famous but ill-fated Braddock march from the Potomac to the Ohio, a Virginia road maker and surveyor, Colonel Washington, but later the founder of our nation, gave the colonies a lasting remembrance of the perilous disadvantages in time of war of bad roads, and as an obstacle in time of peace in reaching our extended frontier.

The construction of the famous National Pike, almost a century ago, extending from certain navigable streams entering the Atlantic to the waters of the Ohio, traversing seven different States of the Union and covering 800 miles, is a model for good road building of the present day. It followed the Braddock route long distances, and was costly in its construction. It affords an illustration not only of how good roads should be made, and what good roads can accomplish in any community, but what they can do in the upbuilding of a nation. Before its completion from four to six weeks were required to transport goods from Baltimore to the Ohio River, and the freight varied from $6 to $10 per hundred, while, after the completion the time as well as the cost was reduced to one-half from Baltimore to Wheeling, and comfortable stage coaches carried mails and passengers between these points in forty-eight hours' time. This road was the first through National highway ever constructed by this Government, and it is significant in having had its initiation under the patronage of the immortal Thomas Jefferson, and having been carried to completion under the administrations of the three illustrious Virginians—Jefferson, Madison, and Monroe.

It seems, therefore, to be eminently appropriate that this great demonstration should be held at this point, almost in sight of the homes of these three great Presidents.

Thomas Jefferson himself was born near this route. He appreciated the necessity for good roads, and further realized that, to make a system uniform and complete for all the country, it must have National aid and appropriate legislation. He lived to see it a success, and saw conveyed upon its well-planned grades and over its smooth and hard surface hundreds of thousands of people and millions of wealth. He saw it break the barrier of the Appalachian Mountains and also become a bond of union between the East and the West. He saw it when as many as 20 four-horse coaches could have been counted in line at one time, and when large broad-wheeled wagons covered with white canvas and carrying often 10 tons of merchandise drawn by 6 Conestoga horses of superb form and strength could be seen at all hours of the day and at all points of the road moving slowly, but surely, to the promised land of the West. It was indeed one vast and continuous caravan. He saw towns and villages grow up as if by magic, and substantial brick and stone taverns constructed at convenient points for the accommodation of the enormous traffic. He saw fulfilled to perfection the mission for which the road was designed. Twenty-five years after his time the steam locomotive entered upon the scene and competed for the constantly increasing transportation. Parallel highways for the iron horse quickly followed, and the glory and utility of this well-remembered road largely ceased. One of the old residents along the route expressed his farewell in these lines:

> We hear no more the clanging hoof,
> And the stagecoach rattling by;
> For the steam king rules the troubled world,
> And the old Pike's left to die.

This was the American Appian Way between the East and the West in the early years of our country's history. It was not, however, built, like the Roman Way, to gratify the vanity of kings and princes, emperors and empires, but wholly to aid in the development and upbuilding of a great Republic. The old Roman highway, however, early gave proof of what good-roads advocates claim to-day. It did a splendid part later on in adding to the material aggrandizement of the empire which was foremost among the nations of the earth in its liberality and public spirit in the construction of good roads. Panthon, the ancient classic author, informs us of the manifold benefits derived by localities along this famous route, and Horace and Virgil have testified their gratitude for many pleasures experienced in their travels over the Appian Way. It has come down to us as one of the monuments of the Roman people. It was so well built that it survived long after the country that built it had perished from the nations of the earth.

Of Jefferson's historic National road it may be said that, while it has gone out of existence and is largely but a memory, yet the benefits which it achieved in its day in aid of the mighty growth and expansion of our beloved country have left an impress which will continue to the end of time.

Virginia was the pioneer in urging and advocating a National system of good roads. The first official suggestion as to the old National Pike was contained in a report made by Governor Giles of Virginia in 1802, and, in the Congress of 1803 following, a similar report was made by Mr. Randolph, of Virginia, and this was approved. The act of April 20, 1802, for the admission of Ohio provided that one-twentieth part of the net proceeds of the public lands within that State sold by Congress should be applied to public roads leading from navigable waters emptying into the Atlantic Ocean to the State of Ohio, and through that State, to be laid out by authority of Congress. In 1803, Congress appropriated 3 per cent of the 5 per cent of the sales of public lands for constructing roads within the State of Ohio, leaving the 2 per cent for roads leading to that State. Similar acts were passed in 1816 on the admission of Indiana, and in 1818 on the admission of Illinois, and also in 1820 on the admission of Missouri.

On March 29, 1806, President Jefferson approved the act of Congress which formally authorized the construction of the great road. It was he who appointed the commissioners to lay out the road, and he who secured the consent of Pennsylvania, Maryland, and Virginia for its construction through those States. In their report to Mr. Jefferson, dated December 20, 1806, the commissioners say that:

> They can not withhold assurance of a firm belief that the purse of the Nation can not be more seasonably opened or more happily applied than in promoting the speedy and effectual establishment of a great easy road on the way contemplated. * * * Nothing short of a firm, substantial, well-formed, stone-capped road can remove the causes which lead to the measure of improvement.

This great enterprise seems to have been but an object lesson for Virginia and for Jefferson, as it led about the same time to that memorable exploration for another and greater road to the far-away waters of the Pacific Ocean, under the command of the two famous Virginia pathfinders, Capts. Meriwether Lewis and William Clark.

The centennial anniversary of this world-renowned expedition and of the memorable winter camp of the Virginia explorers near the great Columbia River, in what is now the State of Oregon, will be celebrated in 1905 in Portland, the flourishing metropolis of that State, with a splendor and liberality that will be worthy of the event which it commemorates.

In that fair land you will now behold more than a million of prosperous and contented American citizens producing and exporting to all quarters of the earth, by sea and by land, vast quantities of wheat, flour, salmon, lumber, hops, fruits, and live stock, and receiving in return the multiplied products of other lands. Thus Virginia and the far-away Pacific Northwest, bound together by this association, can meet in reciprocal union on that joyous occasion.

As if these glorious epochs were not enough for one State, there was still held in reserve another renown which should eclipse all the rest. A prophetic vision of the immortal Jefferson beheld beyond the Mississippi a vast empire reaching in seemingly endless expanse to the lofty summit of the Rocky Mountains, and all under the dominion of another nation. With his penetrating judgment he realized the value of this domain to the permanent peace and safety, the prosperity and the happiness of the nation. With the public sentiment, and with a Congress in cordial sympathy with his views, his purposes, and his efforts, he succeeded in acquiring from France this expansive area which now contains in whole or in part thirteen States and Territories of this our unrivaled nation, and being seven times the area of Great Britain and Ireland, more than four times that of Germany, and exceeding the combined area of Great Britain, Germany, France, Spain, Portugal, and Italy. The story is a long one but as splendid as it is long, and the historic page contains no achievement in the art of diplomacy, and in the course of honorable peace, more resplendent, more far-reaching in its results, or more potent in the welfare of millions of mankind than the purchase of the Louisiana Province. And when there shall assemble in the city of St. Louis in the year 1904 the legions of grateful and patriotic Americans and the multitudes who will gather there from the utmost limits of the earth, the proudest plaudits from heart and tongue will be those to the memory of the sage of Monticello.

In the fullness of our obligations to Old Virginia for its gallant men, and the priceless heritage they have left us, we must still remember that near this noted place another leader of those times was born—that heroic representative of the pioneer, the explorer, and the self-sacrificing patriot—Gen. John Rogers Clarke, he to whose daring and timely deeds, more than to any other one, we owe our possession of Ohio, Indiana, Illinois, Wisconsin, and a portion of Michigan.

From a certain mountain summit in this region we can view the birthplace of three of these Virginians who were instrumental in acquiring to the United States more than one-half of its present enormous domain; and almost in sight are the hills upon the Potomac where rests the illustrious Pater Patriæ, the one who laid the enduring basis for all.

As I seem to behold before me the shadowy forms of these immortals, there likewise appears to view in the majestic procession yet another, the stately presence of that renowned jurist, Chief Justice Marshall, whose home was also in this vicinity. We delight to dwell upon this glorious roll of honor—Washington, Jefferson, Madison, Monroe, Lewis and Clark, John Rogers Clarke, and the peerless and classic Marshall, whose habitations and associations were all within a radius of not many miles from this spot. How revered are such memories to every true American! Let me voice the wish that this road, which henceforth is to mark a magnificent way to the hallowed precincts of Monticello, will ere long be extended to the near-by localities which were the homes of Presidents Madison and Monroe; and still further to the remaining places not far away where the restive spirits of the intrepid Lewis and Clark impatiently awaited the call of Jefferson to depart upon their perilous journey across the trackless wilds,

> . . . Where rolls the Oregon
> And hears no sound save his own dashings.

Many of our fellow-citizens are prompted to make annual pilgrimages to foreign lands, there to pay their homage to the kingly graves within Westminster Abbey, to gaze upon the Pyramids, to revel upon the bright waters of Lucerne and Geneva, or to climb the mountain summits of the Alps, forgetting that in this our own land there are natural wonders and scenic grandeur both in mountain and lake unsurpassed by any other portions of the earth, and there are also sacred memories which attach to the tombs of American sovereigns, the heroic defenders of liberty, and

whose names are imperishably enscrolled upon the temple of fame. We have a Mount Vernon, a Monticello, a Hermitage, a Springfield, and other hallowed places which to every American heart should be fondly cherished and more zealously sought for than the tombs and pyramids of the emperors and kings of the Old World.

Let this fond hope be realized that the meditative pilgrim may approach these shrines from near and far to testify in profound reverence to the blessed memories so precious to our countrymen, and while doing so that he may be inspired with somewhat of the exalted spirit which animated these patriotic forefathers, pioneers, roadmakers, and American empire builders.

Where are they now? Of this glorious constellation not one star remains to shed upon us a mellow luster. All have set—

> . . . Not obscurely bright,
> But one unclouded blaze of living light.

[Prolonged applause.]

Chairman Lee. We have with us this afternoon a gentleman who represents the State of Ohio in the United States Senate, Marcus A. Hanna. [Applause.] He comes here to show his interest in our people and in our State and in the work that is being done. You know, I was wondering how Mr. Hanna happened to be such a fine good fellow, and I have ascertained the reason: His grandfather came from Virginia. [Laughter and applause.]

SOUTHERN DEVELOPMENT.

By Hon. Marcus A. Hanna, *United States Senator from Ohio.*

I came here at the very earnest solicitation of Hon. Martin Dodge, who is one of my constituents at home; in fact, I may say that it was not an invitation, but a command—I had to come and that was all there was about it. When I told Mr. Dodge that I did not know a thing about roads, he said, "Well, you see, you don't need to. I have a lot of hayseed fellows here that don't know anything else." [Great laughter.] "All we want of you is to come and show yourself and convince the good people of Virginia that you have not got any horns." [Laughter.] I was going to tell the story that your chairman has just told. My grandfather was born in Virginia, within 50 miles of your city; so if I have any horns they were sprouted in Virginia.

This road question, my friends, is a practical one. The question of transportation in this great country of ours has been a serious one, and especially so on account of the rapid development and the great expanse of territory, people going from the East to the West, and the enormous production of cereal products, of which the surplus must find a market. It is no wonder then that our whole attention has been centered in the great question of transportation until it should be solved to the extent of finding cheap transportation for the surplus which we had to send to market in our populous cities and in foreign lands. That engrossing subject naturally has caused our people to overlook this important question of home transportation—the transportation to the city, to the railroad station. It is a good sign to see that the people are going back over the line of progress to pick up the missing links, the points which they have neglected or overlooked in this great strenuous effort to better our condition and enlarge our facilities. I presume nowhere else in the country has there been more rapid development in the last decade than in the South, and I came here to-day more to express myself upon that question than to talk upon the subject of roads.

The development and enterprise of the South during my connection with public life has been to me a very interesting subject. It has been interesting because every business man, whether interested in industries or transportation, has known for years the great natural resources of the South. It is a known fact that the greatest repositories of mineral wealth in the United States east of the Rocky Mountains lie south of Mason and Dixon's line [applause]; and it is a pleasant thought to me that the attention of capital as well as effort is being turned in that direction. I wish I had the figures to demonstrate that statement, as to the development of your great manufacturing industries in cotton, springing and growing up in nearly all the Southern States; your great mineral productions in Tennessee and Alabama, destined, in my judgment, some time to be the great steel center of the United States. And although the subject of roads may seem small in comparison, the interest manifested in this is a demonstration of the fact that the people of the South are awakening to the importance of their own interests.

I have had a very interesting time within a day or two in the Senate listening to the eloquent appeal of your Senator, Mr. Martin, in favor of the waterways of Virginia. Well, he persuaded me, because I am just beginning to get acquainted with the necessities of the South, and where you have not the facilities of railroad transportation you should have the facilities that nature has given you to the greatest extent. The nation must take more interest in all the people as time goes on and wealth increases in this country; and wherever its interest is most needed, wherever its help will help the most, there we should devote our energies.

I am happy to have an excuse to come to Virginia and be able to stand before the people of this great State and feel that I am at home, and to give my most hearty approval to this great work inspired by men who have made a study of the proposition and who are able by their common sense and judgment to impress upon the people of this country the importance of it. You will have my hearty sympathy and cooperation. [Prolonged applause.]

Chairman Lee. The next speaker introduced will be the Hon. R. W. Davis, from the State of Florida, the land of sun and flowers, who represents the Second Congressional district. I present Hon. R. W. Davis, of Florida. [Applause.]

REMARKS OF HON. R. W. DAVIS, MEMBER OF CONGRESS FROM FLORIDA.

I came to-day, not to make a speech, but to listen to the discussion before this convention, because I am interested in the subject of good roads. I am one of the "hayseed" Congressmen to whom Senator Hanna referred [laughter], but while interested, I plead not guilty to the charge of knowing anything about it. I believe the Senator said he was not expected to know anything, because the hayseed fellows that Mr. Dodge had brought would know all about it. I know absolutely nothing. A lawyer friend of mine in southwestern Georgia was once a delegate to an agricultural convention. He knew little about law, but he knew less about agriculture. He was introduced, however, to this convention, and with the usual cheek of a lawyer, feeling that he must profess to know something about it, he undertook to advise the assembled agriculturists as to the best time of the year in which to plant hens' eggs in order to raise an early crop of spring chickens [laughter]. Now, if I were to undertake to talk to you technically at least upon the subject of good roads to-day, I should doubtless be as far off the subject as my lawyer friend.

It was my good fortune three or four years ago to induce my friend, the Hon. Martin Dodge, Director of the Office of Public Road Inquiries, to visit my State, and to talk to my people upon the subject of good roads. I promised him that if he would

go there, a convention of people would meet him; and I so arranged it that they did, and he talked to them on the subject of good roads. Down in Florida, although we have a God-given climate, all who have visited us know that we have little or no soil, that sand prevails all over our State, and that good roads are a difficult thing to be secured there, but the visit of Director Dodge put our people to talking. Communities began to discuss this question of good roads among themselves. They began to subscribe, and county commissioners began to vote public moneys in this direction, and to-day Florida with her sandy soil is coming to the front upon the subject of good roads. [Applause.] If we can do it there, what ought you to accomplish upon these historic old red hills in the grand old Dominion? If we can do it there, you ought to be ashamed of yourselves if you do not accomplish it here. [Applause.]

Nothing is more important to a people than good roads. Those old gray-haired fogies of us, like myself and many of you, are used to trotting along any sort of miry road, but knowing the difficulties we have had to endure, we ought to wake up to the necessity of giving posterity something better than we have endured ourselves. Make good roads in your community, and you will bring your urban communities into a better state of prosperity and your suburban communities into a greater state of convenience and happiness, and nothing will accomplish this more surely than the building of good roads.

I thank Senator Hanna for you for all the kind things he has said of the people of the South, and for all he has said tending to encourage us in the South. Let us go forward in the achievement of our final destiny. Men of Virginia, men of the South, let us go forward to fulfill the brilliant prediction that Ohio's brilliant Senator makes for us, and, in doing it, remember that we can do nothing that will put us more firmly in that course than looking after the public roads of our country. [Great applause.]

Chairman Lee. I now take great pleasure in introducing to you another Congressman. This last one came from the State of sunshine, down there in Florida, a very good State, too. The gentlemen I am now going to introduce to you is Hon. Charles E. Littlefield from the State of Maine, clear off on the other side of the country; and when we can unite those extremes on a great question like this, you know we are making progress in the direction we want to go. [Applause.]

REMARKS OF HON. CHARLES E. LITTLEFIELD, MEMBER OF CONGRESS FROM MAINE.

I thought I had succeeded in evading this tremendous responsibility, but it seems otherwise. I am very glad to be here even for a moment to contribute just a word of approval to the object of this convention.

I am glad to be here even for a moment, upon this magnificent historic ground, to contribute even my small mite toward the creation and development of good roads.

I entirely sympathize with you in this absolutely necessary improvement in which you are engaged. I live in a town by the name of Rutland. When I came into this little town of Charlottesville some one called my attention to the different streets and suggested that it was difficult to pass from one sidewalk to the other. In the town where I live, a town of 8,000 or 9,000 people, within ten years you could not cross from one side of the business street to the other after a period of rains without having on rubber boots, and sometimes the mud could get in the tops of the boots. But since then the people of Rutland have paved the streets. When they were paved there were lots of people who objected to the expense, but the city of Rutland

to-day has as fine a lot of streets as you can find in any city or town, paved with the granite that is dug from the granite quarries within 10 or 20 miles from where I live, the largest in the United States, with the greatest development; and there is not a man, woman, or child—because now even the children see the advantages of good roads—that will even harbor the thought of a change back to what existed before.

I wish you, Mr. Chairman and gentlemen, the utmost success in this very laudable undertaking. [Applause.]

Chairman Lee. The next speaker I have the honor to introduce is the Hon. T. H. Tongue, member of Congress from Oregon, who has just been renominated and, I hear, is going to be reelected. We have heard from the North and the South, and now we will hear from the Pacific coast.

BENEFICIAL INFLUENCES OF GOOD ROADS.

By Hon. Thos. H. Tongue, *Member of Congress from Oregon.*

The movement for good roads is important in many ways. It concerns not only the pockets, but the health, the tastes, and even the morals of the people. Problems of transportation have always been, are now, and will continue to be of pressing and exceptional importance. They have engaged the attention of governments, ancient and modern, European, Asiatic, African, and American. They are attracting the attention of private enterprises, and the greatest combinations of capital in the world are endeavoring to control and monopolize the avenues and means of transportation. Our own Government, in its efforts to furnish increasing facilities for water transportation, has expended for the improvement of its rivers and harbors alone the sum of $396,600,720.50. And yet it has only fairly begun this important work. In 1862 the total cash appropriated for the improvement of rivers and harbors was $20,000. In 1899 this had increased to the sum of $40,307,779.48. The House of Representatives has just passed a bill which, in the cash appropriated and the amount which the Secretary of War is authorized to expend under contracts, exceeds $60,000,000. As attesting the interest of the country in the class of transportation that this expenditure is intended to improve, we have the fact that the bill passed the House with scarcely a dissenting vote. In aid of railroad transportation the Federal Government has paid to assist in the building of Pacific railroads, principal and interest upon guaranteed debts, $138,102,919.88. In addition to this, it has granted, as an inducement for the construction of these railroads, an enormous amount of land, aggregating 196,569,372 acres. It is true the money advanced has been largely repaid, but the area of the lands granted as a gift to induce railroad construction equals a vast empire.

While the Government has dealt so liberally, expending hundreds of millions of dollars, and granting a wealth of land for the improvement of water and railroad transportation, it has been painfully parsimonious in its appropriation for the improvement of common highways. Over these highways a large proportion of the vast commerce that goes to form the great railroad and steamboat tonnage must first pass. In addition to this, millions upon millions of tons of local traffic pass over these roads. It is believed that the tonnage of freight and the number of persons carried over common highways equal, if they do not exceed, the tonnage and passengers carried by every railroad train and steamboat in the land. Yet during the last forty years the Federal Government has expended for the improvement of these roads the small sum of $100,000. What has been the result? Just such as might have been expected. Encouraged by the liberal aid extended by the Federal Government, private corporations have expended for the construction and equipment of

American railroads the sum of $11,491,054,960. They have constructed, equipped, and are operating within the United States 192,940 miles of railroad, or enough to encircle the earth eight times at the equator. Millions of money have been expended in building and equipping the finest vessels in the world, engaged in the lake, river, and coastwise transportation, and which in quality, speed, and beauty are unsurpassed by those of any other nation. In railroad and water transportation we have bounded forward with a speed and rapidity beyond the wildest hopes, while in wagon transportation we have remained stationary, or are moving backward. In railroad and water transportation we excel all competitors. In the condition of our common roads we are behind the least civilized nations of the Old World.

In 1870 it cost to ship wheat from Chicago to New York, by an all-rail route, 33.3 cents per bushel. Now over the same route it costs 9.98 cents per bushel, less than one-third. In 1870 it cost to ship a bushel of wheat between the same points on the lake and canal route 17.11 cents. For same freight over the same route now it costs 4.42 cents, practically one-fourth of the same cost. A short time ago the Secretary of the Boston Chamber of Commerce wrote me that fifteen or twenty years ago it cost to ship a ton of provisions from Boston to Liverpool $10; it costs now $1.75; to ship a ton of flour then, $7.50; now, $1.25; to ship a bushel of grain then, 16 cents, against 2 cents now; to ship a bale of cotton then, 2½ cents per pound; it costs 50 cents per bale now; $20 per head for cattle then, $6.25 now. Thirty years ago it cost the Western farmer to ship a bushel of wheat from Chicago to Liverpool by an all-water route 33.11 cents. It costs to ship a bushel of wheat over the same route now 6.42 cents. The struggle with foreign competitors in order to preserve our markets and maintain our trade and commerce, has forced us to rapid and unusual improvements in this class of transportation. During the same period there has been no improvement or reduction of cost, but rather with increase of wages an increased cost in wagon transportation. It costs the Western farmer as much to transport a ton of wheat from his granary to the railroad station or steamboat, 5 miles distant, as it does to ship the same freight from Boston, New York, or any great Atlantic port to the city of Liverpool. It costs the farmer along the line of the Northern Pacific or Great Northern Railroad in the Northwest States and Territories, as much to transport the wheat from his farm to the railroad station, 20 or 25 miles distant, as it does to ship it from Duluth to Queenstown.

Rates of transportation concern every human being in the land. If a purchaser, they affect the value of his product. If a consumer, the price of his purchase. They determine the rise or fall, the prosperity or decay, the wealth or poverty of communities, great centers of trade and commerce, and even of nations themselves. Magnificent cities spring up in a night; the growth of long years sinks to speedy decay with a change in the lines and rates of transportation. The conquest of markets, foreign and domestic, the balances of trade, frequently depend upon rates of transportation. The most important problems that now concern the great West from which I come, and which produces in such abundance the healthful, nourishing, and luscious foods needed to feed the workmen in your factories and the crowded inhabitants of your cities, are problems of transportation. This explains why fruits of unsurpassed flavor and healthfulness, so needed in the East, rot under the trees of Western orchards. It explains why timber of unexcelled quality, which could be made into homes for the homeless in the East, is, on the Pacific coast, cut down and destroyed as something that encumbers the ground. A few years ago our fields and farms and orchards and flocks were neglected, while in the East men, women, and children cried for bread, upon which they were unable to pay the transportation charges. It is because of this that so many of us are praying with all the fervor of our souls that the Senate of the United States will cease talking long enough to do business and pass the bill for the construction of an Isthmian Canal. During the fiscal year ending June 30, 1900, the American people paid for railroad transporta-

tion $1,579,570,830. We are said to pay to foreign ships alone for carrying our commerce to and from the United States $200,000,000 annually. The amount paid for ocean transportation upon American vessels, for water transportation upon the rivers, lakes, and in the coastwise trade, is beyond computation. It is safe to say that every dollar of money in the United States, gold and silver and paper, large denominations and subsidiary, is paid out every year of our existence for railroad and water transportation alone, and yet by far the greater part of the runs and rivulets that feed and swell these great streams of commerce run along our public roads, the common highways and common property of all the people. This probably is true in a smaller degree regarding the products of mines, but it is almost wholly true as regards the products of agriculture. In order to realize the full benefits of the sums we have expended and the improvements we have achieved by rail and steamboat, there should be a corresponding improvement in our common roads. The common road leads to the railroad station and to the wharf upon the bank of lake or river. The stream can not rise higher than the fountain. Without the common highways and the farm wagon, iron rails would rust upon the track and steamboats rot at the wharf. While great combinations of capital are seeking to monopolize and control the water and railroad routes, for the improvement of which the Government has expended so much, the common highways belong to all of the people of the United States. No combination of capital can monopolize or control them. Their benefits, like the dews of heaven, descend alike upon the just and the unjust, the millionaire and the pauper, the child of the poor, as well as the child of the rich. The people's money expended for the improvement of them will bless all the people. There will be no percentage deducted to increase the full coffers of those already rich. The cost of transportation constitutes the largest item of the expenditures of the American people. A saving of 5 per cent of this would represent an amount exceeding the output of every gold mine in the land. A saving for transportation of persons and property over the common roads would be more widely diffused, would inure to the benefit of more people, and to more people who need it, than a decrease on any other expenditure.

I need not dwell upon the importance of good roads as they affect the transportation of persons. They give us increased time and increase of pleasure. We accomplish more, see more of life, live more and longer in one year than our ancestors in ten. Time is becoming of supreme importance. Quickness of change from place to place, speed with which the powers of man can be transferred from one point to another, was never so much desired as now. Speed in transportation is economy of time, and the adage that "time is money" was never truer than now. But I shall not stop to dwell upon this phase of the subject.

Good roads do not concern our pockets only. They may become the instrumentalities for improved health, increased happiness and pleasure, for refining tastes, strengthening, broadening, and elevating the character. The toiler in the great city must have rest and recreation. Old and young, and especially the young, with character unformed, must and will sweeten the daily labor with some pleasure. It is not the hours of industry, but the hours devoted to pleasure that furnish the devil his opportunity. It is not while we are at work but while we are at play that temptations steal over the senses, put conscience to sleep, despoil manhood, and destroy character. Healthful and innocent recreations and pleasure are national needs and national blessings. They are among the most important instrumentalities of moral reform. They are as essential to purity of mind and soul as to healthfulness of body. Out beyond the confines of the city, with its dust and dirt and filth, morally and physically, these are to be found, and good roads help to find them. What peace and inspiration may come from flowers and music, brooks and waterfalls. How the mountains pointing heavenward, yesterday battling with storms, to-day bathed with sunshine, bid you stand firm, walk erect, look upward, cherish hope, and for light

and guidance to call upon the Creator of all light and of all wisdom. How such scenes as these kindle the imagination of the poet, quicken and enlarge the conception of the artist, fire the soul of the orator, purify and elevate us all. But if love of action rather than contemplation and reflection tempts you, how the blood thrills and the spirits rise as one springs lightly into the saddle, caresses the slender neck of an equine beauty, grasps firmly the reins, bids farewell to the impurities of the city, and dashes into the hills and the valleys and the mountains to commune with nature and nature's God. Or what joy more exquisite than with pleasant companionship to dash along the smooth highway, drawn by a noble American trotter? What poor city scenes can so inspire poetic feeling, can so increase the love of the beautiful, can so elevate and broaden and strengthen the character, and so inspire us with reverence for the great Father of us all? But for the full enjoyment of such pleasures good roads are indispensable.

Another blessing to come with good roads will be the stimulus and encouragements to rural life, farm life. The present tendency of population to rush into the great cities makes neither for the health nor the character, the intelligence nor the morals of the nation. It has been said that no living man can trace his ancestry on both sides to four generations of city residents. The brain and the brawn and the morals of the city are constantly replenished from the country. The best home life is upon the farm, and the most sacred thing in America is the American home. It lies at the foundation of our institutions, of our health, of our character, our prosperity, our happiness, here and hereafter. The snares and pitfalls set for our feet are not near the home. The pathways upon which stones are hardest and thorns sharpest are not those that lead to the sacred spot hallowed by a father's love and a mother's prayers. The bravest and best men, the purest and holiest women are those who best love, cherish, and protect the home. God guard well the American home, and this done, come all the powers of darkness and they shall not prevail against us. Fatherhood and motherhood are nowhere more sacred, more holy, or better beloved than upon the farm. The ties of brotherhood and sisterhood are nowhere more sweet or tender. The fair flower of patriotism there reaches its greatest perfection. Every battlefield that marks the world's progress, the victory of liberty over tyranny or right over wrong, has been deluged with the blood of farmers. He evades neither the taxgatherer nor the recruiting officer. He shirks the performance of no public duty. In the hour of its greatest needs our country never called for help upon its stalwart yeomen when the cry was unheeded. The sons and daughters of American farmers are filling the seminaries and colleges and universities of the land. From the American farm home have gone in the past, as they are going now, leaders in literature, the arts and sciences, presidents of great universities, the heads of great industrial enterprises, governors of States, and members of Congress. They have filled the benches of the Supreme Court, the chairs of the Cabinet, and the greatest executive office in the civilized world. Our greatest jurist, our greatest soldier, our greatest orators, Webster and Clay, our three greatest Presidents, Washington, Lincoln, and McKinley, were the product of rural homes. The great Presidents which Virginia has given to the nation, including one whose name is in every thought here to-day, whose monuments are all around us, whose remains rest in your midst, whose fame is immortal, drew life and inspiration from rural homes. The typical American to-day is the American farmer. The city life, with its bustle and stir, its hurry and rush, its feverish anxiety for wealth, position, and rank in society, its fretting over ceremonies and precedents, is breaking down the health and intellect and the morals of its inhabitants. These must be replenished from the rural home. Whatever shall tend to create a love for country life, to decrease the rush for the city, instill a desire to dwell in the society of nature, will make for the health, the happiness, the refinement, the moral and intellectual improvement of the people. Nothing will contribute more to this than the improvement of our common roads, to

facilitate the means of communication between one section of the country and the other, and between all and the city.

I commend the work now being carried on under the superintendence of Director Dodge. In proportion to the expenditure of public money, no work is now being carried on by the General Government that will bring so much good to so many people, and particularly to so many of those whom we call the common people, and whom Lincoln said God must love "because he created so many of them." This work merits the most considerate and liberal treatment from American statesmen. The work should be carried on in every State of the Union. On behalf of the people of Oregon, I extend a most cordial and sincere invitation to Director Dodge and his able assistants to come and bring their machinery to the great West. When you learn the way and come to know us, come again. Come often, and stay over several nights. Bring your friends with you, and above all, bring your Secretary of Agriculture, who inherits the patriotism of a Wallace, the courage of a Bruce, and the chivalry of a Douglas—that member of the Cabinet, who, more than all others, has the warmest place in the hearts of the Western farmer. We will give you a genuine Western welcome, than which none is more sincere, or comes more direct from the heart. We promise you such a country and such scenery as your eyes have never beheld, a climate of unsurpassed healthfulness, a land more beautiful than the garden of Eden, richer than the valleys of the Nile, and grander than the Alps of Switzerland. At noonday you can recline beneath the shades of forest giants, towering 260 feet above you, through whose branches sigh the spirit of the ages, and upon which linger longest the last rays of the setting sun, as it leaves the Western continent on its journey around the world. You can refresh yourselves with fruits fit for the gods, and gladden your eyes with flowers that never fade. You may look out upon rich prairies, bearing upon their bosoms magnificent crops, orchards burdened with fruits, rich with imprisoned sunshine, and pastures upon which graze the choicest of flocks and herds. Under the July sun you may gaze upon the whitened summits of our snow-capped mountains, the majestic Hood, the beautiful St. Helens, Mount Adams, the Three Sisters, Mount Rainier, Mount Shasta, and Mount Jefferson, typifying in its beauty and grandeur the life and character of that great American whose last resting place hallows the land all around us. You can witness a combination of beauty and grandeur not equaled in any other land; and when your day's work is done you may sink to rest to the murmur of the ocean, the music of the waterfall, and the sound of the great river, no longer lost "in the continuous woods where rolls the Oregon," but surrounded by a wholesome, happy, and prosperous people, while the mountains, like armed sentinels in the night, keep watch and guard over your peaceful slumbers.

Chairman LEE. I want to say a word for the purpose of testifying our great appreciation of the interest manifested in this very important subject by the large audiences that have attended the meetings in the armory, and I now declare this convention adjourned sine die.

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