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PROGRESS OF ROAD BUILDING IN THE UNITED STATES.

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INTRODUCTION.

The history of road building in the United States parallels in but few particulars the road history of the other great civilized nations of the world, and in many respects our highways bear but slight resemblance to those of the older countries. There is little doubt that had the first settlers arrived in this country when the Roman Empire was at the zenith of its glory our Republic would now be bound together with a perfect system of magnificently constructed highways, but when America was settled by the English, in the early part of the seventeenth century, the mother country was still using those systems in road building which it had inherited from the dark ages.

The Britons neglected the roads which had been made by the Romans, and, failing to build new ones, their country for centuries was provided with only bridle paths, or at most with narrow highways for small carts. These highways were, except in dry weather, practically impassable, and in the sparsely settled districts much of the travel had to be carried on by means of pack animals. The idea of a central control of road systems, which is the only means by which any extended work in this direction has ever been accomplished, had died out in the middle ages and had not at this time been revived. For these reasons the traditions relative to the construction and management of roads which followed the first settlers to this country were practically valueless.

ROAD METHODS OF THE FIRST SETTLERS.

The first settlements in the United States were naturally located along the seashore and upon the banks of navigable streams. Narrow and mysterious Indian trails led from the settlements along the coast to the interior, and aside from an occasional rude path beside some stream or along the coast, these were the only lines of communication up to the end of the seventeenth century. Indeed, for a century after the settlement at Plymouth Rock there were few roads in this country over which goods or passengers could be transported in wagons or carriages.

The little traffic and intercourse that were carried on between the settlements was maintained principally by boats or by horsemen or

pack trains over the obscure Indian trails. A systematic attempt at road building was then, of course, impossible, owing to the crude state of society and the sparse population. Soon there was an eagerness to penetrate the vast wilderness of the interior and communicate with settlers in other regions by shorter routes than those afforded by the winding streams. Acting upon this impulse, the pioneer blazed his way through the forests and brambles. He made temporary bridges over the streams by felling large trees across them, and threw brush and poles over the boggy places in his bridle paths. With the steady increase in wealth and population, this "pack-train era" in road building was gradually superseded by original trackways or widened trails and then by wagon roads, but without any attempt at improvement. Another century elapsed before anything like improved highways was established outside the eastern coast districts, and it was not until the beginning of the present century that there were any well-built roads in the rural communities.

ONE OF THE EARLIEST ROADS IN THE UNITED STATES.

The first great American road which the historian tells anything about was laid out in 1711, and ran from New York to Philadelphia. Its antiquity, and the fact that it connected these two cities, gave to it the name "The Old York Road." The opening of roads was an important affair in those days; money was more scarce than it is now, and doubtless it was more of an undertaking to construct roads than it is to build the railways of to-day. By studying the history of the Old York Road we at once realize the potency of the adage that "the history of roads is the history of civilization." The Indian trail, the blazed trees, and the footpath, followed by the bridle road for pack trains, and then the rough roads for carts and wagons, which were subsequently graded and paved, making a more easy means of transportation, are all stepping stones to higher degrees of civilization.¹

FORCED-LABOR SYSTEM AND ROADS OF THE EARLY COLONISTS.

In the early colonial days the roads were at first built and maintained principally by the use of volunteer aid or free labor. Each town or settlement had what was called a "village green," and in this open place the citizens assembled to discuss matters of public import. At these meetings the care of the poor, the infirm, the deaf mutes, etc., was discussed; the opening of new and the maintenance of the old roads were also among the most interesting subjects of discussion. The citizens would here offer their services free of charge to the community or town for building or maintaining the roads running through or by their lands. These offers to maintain the roads free of charge soon became so limited, however, that the towns were forced to pass

¹The York Road Old and the New Fox Chase and Bustleton, by S. F. Hotchkin.

ordinances compelling all able-bodied men to "work the road" a specified number of days, or in lieu of such labor to pay a money tax to the pathmaster or road overseer. It is easy to trace progress in all those matters which were discussed on the "village green" save one, and that is the "forced-labor" system of working roads, which exists in most of the States to this day.

The following extract, relating to the early methods of locating and building roads, is copied from a letter dated November 30, 1785, written by George Washington to Patrick Henry, then governor of Virginia:

Do you not think, my dear sir, that the credit, the saving, and convenience of this country all require that our great roads leading from one place to another should be straightened, shortened, and established by law, and the power in the county courts to alter them be withdrawn? To me these things seem indispensably necessary, and it is my opinion they will take place in time. The longer, therefore, they are delayed, the more people will be injured by the alterations when they happen. It is equally clear to me that, putting the lowest valuation upon the labor of the people who work upon the roads under the existing law and the customs of the present day, the repairs of them by way of contract, to be paid by an assessment on a certain district, until the period shall arrive when turnpikes may with propriety be established, would be infinitely less burthensome to the community than the present mode. In this case the contractor would meet no favor; every man in the district would give information of neglects; whereas negligence under the present system is winked at by the only people who know the particulars or can inform against the overseers, for strangers had rather encounter the inconvenience of bad roads than the trouble of an information, and go away prejudiced against the country for the polity of it.¹

This system of "working out" the tax was as unsatisfactory in the days of Washington as it is now. Much delay and inconvenience was caused by the deplorable condition of the main roads. The ruts were deep, the hills steep and full of gullies, and when stagecoaches were first used travelers were often compelled to get out and assist the driver in pulling the vehicle out of the mud. Even the roads running out of the large cities and towns were no exception to the general rule; they were often in such wretched condition that passage was rendered difficult and sometimes dangerous. It was no uncommon sight to see the horses floundering in mud up to their haunches.

York road, running out of Philadelphia, was a quagmire of black mud for nine months of the year, and on this road long lines of wagons were every day to be met with drawn up near Logan's Hill, where the wagoners unhitched their teams to assist each other in pulling through the deep sloughs. Sticks or rails were often stuck up to warn travelers out of the quicksand or mud holes, and the fences were sometimes pulled down in order to permit passage through the adjacent fields.²

In 1796 the worst road in the country was said to be the one from Elkton, Md., to the Susquehanna Ferry. It was so uneven and full

¹ Writings of Washington, Vol. XII, edited by J. Sparks.

² Watson's Annals of Philadelphia and Pennsylvania in the Olden Times.

of holes that stagecoach passengers were often requested by the driver to lean out the side of the coach to prevent being overturned. "Now, gentlemen," he would say, "to the right;" "Now, gentlemen, to the left."¹

INAUGURATION OF TURNPIKE ROADS BY CHARTERED COMPANIES.

The making of turnpike roads by chartered companies was inaugurated in the last quarter of the eighteenth century with the advance of population to the West. State and national charters were given to many turnpike companies, which at first yielded large profits to capitalists. The establishment of turnpikes and the maintenance of them by toll, however, effected but little improvement in the general system, and the tax imposed upon those who were compelled to use many of these roads was not paid without protest.

THE WILDERNESS TURNPIKE.

The Wilderness Turnpike was the name of one of the earliest of these roads. From the Shenandoah Valley, in Virginia, it followed for some distance the Holston River; thence it crossed the Allegheny Mountains at Cumberland Gap to central Kentucky. This route was opened at first for pack trains, but afterwards was so improved that it became the main road for wagon trains from Virginia to the valley of the Ohio. A large commerce was carried on between Virginia and the West over this highway, and it proved very advantageous to Kentucky and adjacent States in their early settlement and development. During the first decade of this century the Wilderness Turnpike was the best highway south of the Potomac River; but soon the traffic began to decrease and the revenues became so limited that it was neglected. For years, however, the tollgates were maintained and travelers were required to pay a toll of \$2 on passing the gates, which were 70 miles apart, although tools frequently had to be carried in the vehicle with which to repair the portions of the road that were impassable.²

THE PHILADELPHIA-LANCASTER TURNPIKE.

The desire to speculate in those days was as great as it is now, and such were the profits of some of these roads that they were often the subject of speculation. A notable example of this is shown by the organization of a company in 1792 to build a turnpike from Philadelphia to Lancaster, Pa., a distance of 60 miles. The charter was secured, and in ten days 2,275 subscribers made application for stock. As this was more than the law allowed, the names were placed in a lottery wheel and 600 were drawn; with these subscriptions the work began. The road builders of that day knew little or nothing regarding

¹ History of the People of the United States.

² N. S. Shafer, *American Highways*, pp. 19 and 93.

the construction of highways, and the mistakes made on this occasion taught them some valuable lessons. The land was condemned, the trees felled, and the roadbed prepared. The largest stones that could be found were dumped upon it for a foundation, and upon this colossal base earth and gravel were spread; then the work was declared complete; but when the washing rains came deep holes appeared on every hand, sharp stones protruded from the surface, and the horses received scratched and broken limbs as they sank between the bowlders up to their knees. The gigantic error of the road builder was then made plain. Indignation meetings were held, at which the turnpike company was condemned and the legislature blamed for giving the charter. Had it not been for an Englishman who offered to rebuild the turnpike on the macadam plan, as he had seen roads built in the old country, improved road construction would have received a severe blow. The Englishman's proposition was accepted by the company, and he was successful in completing the Lancaster and Philadelphia turnpike road, which was then declared to be "the best piece of highway in the United States—a masterpiece of its kind."¹

ERA OF SPECULATION AND RESTORATION OF FORCED-LABOR SYSTEM.

The success of the Lancaster pike encouraged road building everywhere, and before the first decade of the new century had elapsed many of the well-settled States were voting money, setting apart revenues derived from the sale of public lands, and establishing lotteries to build turnpikes between prosperous towns in the East and to the frontier. The prospect of increasing their land values by the building of good roads and the fascination of receiving large dividends from investments induced many people to risk their all upon these schemes. Speculation was rife in the land, turnpike building rapidly became the rage, and in a few years a sum almost as large as the public debt at the close of the Revolution was invested by the people in turnpike ventures. By 1811 over 317 pikes had been chartered in New York and in the New England States, their total length being 4,500 miles and their combined capital over \$7,500,000. Hundreds of miles of public turnpikes² were constructed in New York and in some of the Western States with thick, wide boards or planks, and for a few years it was thought that this method would supersede all others. While the planks lasted the roads were good; but the boards decayed very rapidly, and for this reason the method, proving unsuccessful, was

¹ History of the People of the United States, Vol. II, p. 554.

² The term "turnpike" is of medieval origin, having been first used in England to designate a graded road, for the use of which travelers were expected to pay toll. A pike across the road indicated a tollgate, where the traveler was required to stop before proceeding on his journey. After he had paid the fees the pike was turned and he was allowed to go on his way. "Turnpike" has now come to mean any public highway constructed of stone or gravel. As a rule, however, the term is only applied to a toll road or one upon which formerly toll was collected.

gradually abandoned. Except for a few short stretches in the New England and the Southern States, the toll system also proved unsuccessful, and many of the companies lost money. Some surrendered their charters and others were bought out by the States or counties. The turnpike system was gradually superseded by the restoration of the "forced-labor" system, explained elsewhere, and until within the last few years this method was universally followed, each county taking care of its own highways. The States exercised no supervision whatever, and skilled road builders or road engineers were unheard of. The "forced-labor" system was borrowed by our ancestors from the dark ages, and is not unlike the "militia" system adopted in Kentucky and a few other Southern States.

NATIONAL HIGHWAYS.

Early in the present century, with the movement started in England by Telford and Macadam in favor of broken-stone roads, the importance of improved roads for military, postal, and commercial purposes began to be widely appreciated. Road reform assumed such proportions that it was advocated by many of the great patriots of the day; indeed, the movement waxed so strong in this country that it became one of the leading questions of national politics, and was supported by such statesmen as Thomas Jefferson, John C. Calhoun, and Henry Clay. Next to the tariff, it was one of the most important subjects under consideration in Congress.

Those who believed in a liberal construction of the Constitution were favorable to the building of roads by the General Government, while the strict constructionists denied the power of the Government to spend money for any such internal improvements. During President Jefferson's second term the bill admitting Ohio as a State, passed April 30, 1802, contained a provision setting apart 5 per cent of the net proceeds from the sale of public lands in that State to the building of public roads leading from the navigable waters emptying into the Atlantic to and through the State of Ohio—3 per cent for road making within the State and 2 per cent for highways outside the State. Such roads were to be laid out under the authority of Congress and with the consent of the States through which they would pass.

THE CUMBERLAND ROAD.

In 1806 the sale of public lands in Ohio had amounted to over \$600,000, and after some discussion in both Houses of Congress a bill appropriating \$30,000 was passed. The construction of the so-called Cumberland road was then begun. From Cumberland, Md., it was to extend through southwestern Pennsylvania and over the Allegheny Mountains to the Ohio at Wheeling, W. Va., and then on to St. Louis, Mo. It was constructed after the principles advocated by Telford and Macadam, and was so well built that it is yet a good road, although



FIG. 1.—THE BIG CROSSING ON THE OLD CUMBERLAND ROAD, SUMMERVILLE, PA.



FIG. 2.—OLD CUMBERLAND ROAD APPROACHING CHESTNUT RIDGE MOUNTAINS, PENNSYLVANIA (LOOKING WEST).

it has since passed into the hands of the States in which it is located, and has not been systematically repaired for years. (Pl. XIII.) This road was well described by a writer in 1879, as follows:

It was excellently macadamized; the rivers and creeks were spanned by stone bridges; the distances were indexed by iron mileposts, and the tollhouses supplied with strong iron gates. Its projector and chief supporter was Henry Clay, whose services in its behalf are commemorated by a monument near Wheeling. There were sometimes twenty gaily painted four-horse coaches each way daily. The cattle and sheep were never out of sight. The canvas-covered wagons were drawn by six to twelve horses. Within a mile of the road the country was a wilderness, but on the highway the traffic was as dense as in the main street of a large town. Ten miles an hour is said to have been the usual speed for coaches, but between Hagerstown and Frederick they were claimed to have made 26 miles in two hours. These coaches finally ceased running in 1853. There were also through freight wagons from Baltimore to Wheeling which carried 10 tons. They were drawn by twelve horses, and their rear wheels were 10 feet high.

From Cumberland to Baltimore the road, or a large part of it, was built by certain banks of Maryland, which were rechartered in 1816 on condition that they should complete the work. So far from being a burden to them, it proved to be a most lucrative property for many years, yielding as much as 20 per cent, and it is only of late years that it has yielded no more than 2 or 3 per cent. The part built by the Federal Government was transferred to Maryland some time ago, and the tolls became a political perquisite; but within the past year it has been acquired by the counties of Allegany and Garrett, which have made it free.

From 1810 to 1816 six appropriations, amounting to \$680,000, were made by Congress for continuing the work on this road.

PROPOSITION IN CONGRESS FOR A NATIONAL SYSTEM OF ROADS.

In 1817 John C. Calhoun, Henry Clay, and others favored the creation of a new fund for internal improvements. A bill was introduced in the House of Representatives by Mr. Calhoun to set aside for roads and canals the bonus and dividends received by the United States from its newly chartered national banks. In supporting this measure Mr. Calhoun, although a staunch believer in the doctrine of State rights, delivered a speech before the House in which he thus expressed himself:

Let it not be said that internal improvements may be wholly left to the enterprise of the States and of individuals. I know that much may justly be expected to be done by them; but in a country so new and so extensive as ours there is room enough for all, the General and State governments and individuals, to exert their resources. Many of the improvements contemplated are on too great a scale for the resources of States or of individuals, and many of such a nature that the rival jealousy of the State, if left alone, might prevent. They require the resources and general superintendence of the Government to effect and complete them.

But there are higher and more powerful considerations why Congress should take charge of this subject. If we were only to consider the pecuniary advantages of a good system of roads and canals, it might indeed admit of some doubt whether they ought not to be left wholly to individual exertions; but when we come to consider how intimately the strength and political prosperity of the Republic are connected with this subject, we find the most urgent reasons why we should apply

our resources to them. Good roads and canals, judiciously laid out, are the proper remedy. Let us, then, bind the Republic together with a perfect system of roads and canals.

The first great object is to perfect the communication from Maine to Louisiana. This may be fairly considered as the principal artery of the whole system. The next is the connection of the lakes with the Hudson River. The next object of chief importance is to connect all the great commercial points on the Atlantic with the Western States, and, finally, to perfect the intercourse between the West and New Orleans. There are others, no doubt, of great importance which will receive the aid of the Government. The fund proposed to be set apart in this bill is about \$650,000 a year, which is doubtless too small to effect such great objects of itself, but it will be a good beginning. Every portion of the community—the farmer, the mechanic, and the merchant—will feel its good effects; and, what is of greatest importance, the strength of the community will be greatly augmented and its political prosperity rendered more secure.

Henry Clay also spoke in favor of the proposed act, particularly in reference to its constitutional merits, but the House amended and passed it in such a manner as to enable the States to prosecute the work under the supervision of the National Government, and in this form it passed the Senate. On March 13, 1817, President Monroe vetoed this bill on the ground that he believed it to be unconstitutional, even though its provisions were agreed to by the States. An attempt was made to pass it over the President's head, but failed of the necessary two-thirds majority.

CONGRESSIONAL ACTION REGARDING ROAD BUILDING.

Upon the defeat of the bill for a national system of roads and for the funds for the same, Congress returned to its former method of providing for road building from funds derived from sale of public lands. In 1811, 5 per cent of the net proceeds of the sales of public lands in Louisiana were, as in the case of Ohio, given to that State for the building of roads and levees, in 1816 the same percentage of a similar fund was given to Indiana for roads and canals, and in 1817 a like sum was given to Mississippi for this purpose. In 1818, 2 per cent of a similar fund was given to Illinois for roads leading to that State; in 1819, 5 per cent to Alabama; in 1820, 5 per cent to Missouri, and in 1845, 5 per cent to Iowa. In the meantime the annual appropriations for the Cumberland road, of sums to be replaced from the funds thus set aside in the States through which it passed, were continued. For the fiscal year 1819 over half a million was donated, and on May 25, 1838, the last appropriation, amounting to \$150,000, was made, the sum total being about \$7,000,000.

While the Cumberland road was being built twelve other great national highways were laid out in the States and Territories, making what was then regarded a complete system of roads, and more or less work was done in opening and constructing them. Congress provided in 1806 for a road from the frontier of Georgia, leading toward New Orleans, La., and one from Nashville, Tenn., to Natchez, Miss.

From 1806 to 1838 a total of \$1,600,000 was appropriated by Congress for roads in various places, and of this sum \$200,000 was used in Florida; \$286,000 was expended for a road from Chicago, Ill., to Detroit, Mich., and other points; \$206,000 was also used toward the construction of a road from Memphis, Tenn., to the St. Francis River, in Arkansas. In addition to the appropriations above mentioned, grants of land have been made from time to time by the States to aid in the work, and the labor of United States troops has been occasionally employed.

In 1822 the regular appropriation for the Cumberland road was vetoed by President Monroe, and in 1830 the Maysville and Lexington turnpike bill, authorizing a Government subscription to the stock of a turnpike company in Kentucky, was passed by Congress, but was vetoed by President Jackson.

The monetary crisis of 1837 put a damper on all projects requiring large Government expenditures, and from that time to 1854 only a few small appropriations were made. Another period of activity then began and lasted until the civil war, during which time over \$1,600,000 was laid out chiefly on roads in the Territories. From that time to this only a few military roads have been made, and of late years nothing has been done in the way of national aid, save the building of roads in the District of Columbia, in national cemeteries, and on reservations.

INTRODUCTION AND DEVELOPMENT OF STEAM RAILROADS.

The work of building national highways, it will be observed from the foregoing, progressed but slowly, and before much had been accomplished in this direction steam railroads were introduced. It was seen at once that this form of transportation would be far superior to the old method, and many people believed that railroads would eventually do away with the need of public highways. The national highways were, therefore, abandoned, and for several decades thereafter the public roads were almost completely neglected, while private capital undertook the construction of railroads.

The railroad had its birth in the United States on the Fourth of July, 1828. On that day the ceremony of breaking ground for the Baltimore and Ohio Railroad was performed by Hon. Charles Carroll, who was at that time the only surviving signer of the Declaration of Independence. From the small section that was operated at first by horse power has grown a system which places this country in the front rank in the character and extent of its railroads.

The mania for building railroads soon began to spread; speculators again came to the front, as they had done when turnpike building was so popular. Railway lines were projected which, had they all been built, would have far surpassed the number now in actual operation. Seven years after the commencement of the construction of

the Baltimore and Ohio, over 1,000 miles of railroads were in operation in the United States, and to-day they penetrate nearly every section of our land.

Thus, the rapid development and extension of railways has, to a large extent, monopolized the thoughts, energies, and finances of the people, and tended to exclude consideration of the no less important source of national development, the public highways.

There must, however, be a limit to the building of railroads. With all our railroads, the transportation problem has not yet been solved. Indeed, the building of so many railroads has made it more necessary than ever that the primary means of transportation, the country road, should be improved. Ninety-nine per cent of all the commerce of the United States which is transported by steam is carried for some distance over the public thoroughfares, and "it costs as much in some cases to haul goods to or from the railway station over the country road as it does to transport by steam the same amount of goods from ocean to ocean or from continent to continent."

DIFFICULTIES OF TRANSPORTATION AND OF TRAVEL.

For many years after the introduction of railroads so little attention was given to the construction and maintenance of the public highways that their condition in most places became even more deplorable than ever. The local roads as well as the interstate turnpikes became practically impassable. As an illustration of these conditions the following facts are cited:

When agricultural machinery began to be manufactured at Walnut Grove, Va., great difficulty was experienced in procuring some of the material which had to be brought from a distance. Neither was it easy, when the machines were once manufactured, to get them to market. Sickles were made 40 miles away, but as there were no railroads and but few highways fit for wagons, the blades, 6 feet long, had to be carried on horseback. It was soon realized that while reapers were luxuries in Virginia and the East, they were a necessity in Ohio and Illinois and on the plains of the great West. When it was discovered that the West was the natural market for these agricultural machines, the next and most difficult question was that of getting them there. The question was finally solved by shipping the first consignment, in 1844, by wagon trains from Walnut Grove to Scottsville, Va., then down the canal to Richmond, thence by water down the James River into the Atlantic and around Florida into the Gulf of Mexico, thence by way of New Orleans up the Mississippi and Ohio rivers to Cincinnati, Ohio.¹

When Charles Dickens visited America in 1842 he had occasion to travel by stagecoach from Cleveland to Sandusky, Ohio. His

¹Men of Achievement, Inventors, by P. S. Hubert, jr.



FIG. 1.—THE ROLLED FOUNDATION OF AN OBJECT-LESSON ROAD BUILT AT HOT SPRINGS, VA., UNDER THE AUSPICES OF THE OFFICE OF PUBLIC ROAD INQUIRIES OF THE DEPARTMENT OF AGRICULTURE.



FIG. 2.—FINISHING TOUCHES TO THE SAMPLE ROAD BUILT AT HOT SPRINGS, VA., UNDER THE AUSPICES OF THE OFFICE OF PUBLIC ROAD INQUIRIES OF THE DEPARTMENT OF AGRICULTURE.

description of part of this journey can be used here to good purpose in describing the condition of many of the public roads of that day:

At one time we were all flung together in a heap at the bottom of the coach, and at another we were crushing our heads against the roof. Now, the coach was lying on the tails of the two wheelers; and now it was rearing up in the air in a frantic state, with all four horses standing on the top of an unsurmountable eminence. * * * The drivers on these roads, who certainly got over the ground in a manner which is quite miraculous, so twist and turn the team about in forcing a passage, corkscrew fashion, through the bogs and swamps, that it was quite a common circumstance on looking out of the window to see the coachman with the ends of a pair of reins in his hands, apparently driving nothing, or playing at horses, and the leaders staring unexpectedly at one from the back of the coach, as if they had some idea of getting up behind. A great portion of the way was over what is called a corduroy road, which is made by throwing trunks of trees into a marsh and leaving them to settle there. The very slightest of the jolts with which the ponderous carriage fell from log to log was enough, it seemed, to have dislocated all the bones in the human body. It would be impossible to experience a similar set of sensations in any other circumstances, unless, perhaps, in attempting to go up to the top of St. Paul's in an omnibus. Never, never once that day was the coach in any position, attitude, or kind of motion to which we are accustomed in coaches. Never did it make the smallest approach to one's experience of the proceedings of any sort of vehicle that goes on wheels.

This description also serves to illustrate the condition of the country roads, except in a few wealthy communities, twenty or twenty-five years ago. Kentucky was famous for her fine roads a generation ago. Even before the Eastern States had made any decided progress in this direction the State of Kentucky aided the construction of turnpikes by large county and State appropriations. Few States have been more liberal in promoting the building of better highways than Kentucky. The wretched condition of the country roads as well as the ever-increasing need for better ones did not, however, begin to attract widespread attention until something over ten years ago, but, although the movement is yet young in years, the agitation has already led to a general crusade which foreshadows thorough reformation.

ESTABLISHMENT OF THE OFFICE OF PUBLIC ROAD INQUIRIES.

Some road reformers think, as thought many of the founders of the Republic, that the General Government should aid in the building of the principal roads. This idea, however, has met with little encouragement; but out of the agitation has grown a law, passed by Congress in 1893, providing for an office in the Department of Agriculture to collect and disseminate information on the road subject, to conduct investigations, inquiries, and experiments regarding road materials and road construction, and to encourage, by object lessons and otherwise, the building of better roads. (Pl. XIV.) Twenty bulletins and thirty-three circulars containing information of great value to good-roads reformers as well as to good-roads builders have been published by the Office of Public Road Inquiries, and the usefulness of such a good-roads propaganda seems to have been fully demonstrated.

PROGRESS OF THE MOVEMENT IN THE STATES FOR GOOD ROADS.

More than half the States have passed new and progressive road laws, and many hundreds of miles of good roads have already been built under the influence of the new conditions of administration, finance, and construction. The general trend of legislation enacted in these States is as follows: More rigid provisions for carrying out the old systems without radical change in the systems themselves; more liberal tax levies; substitution of money tax instead of labor; local assessment, according to benefits, for the construction of new roads; construction by townships, counties, and districts, with power to issue bonds; State highway commissions; provisions for working convicts; regulations compelling and encouraging the use of wide tires; State aid to road building; construction of State roads.

New Jersey was the first State to take any radical step toward the improvement of her public highways. Her State-aid law was passed in 1891. It provides that on petition of the owners of two-thirds of the lands bordering any public road, not less than a mile in length, asking that the road be improved and agreeing to pay 10 per cent of the cost, the county officials shall improve the road, one-third of the expenses to be borne by the State, if the road is brought to the standard fixed by the State commissioner of public roads, and the balance ($66\frac{2}{3}$ per cent) by the county. The State's expenditures for such improvements in any one year are limited to \$150,000, while the county is limited to one-fourth of 1 per cent of its assessed valuation. At this rate the law makes possible the expenditure of \$450,000 a year, and at \$3,000 per mile this builds 150 miles of road. Ten miles of road were built in 1892, 25 miles in 1893, 60 miles in 1894, and since 1895 the applications for new roads have been far in excess of the limit prescribed by law. (Pl. XV.)

Under this law about 450 miles of improved road have already been built in New Jersey, the State's portion of the expense being about \$715,800. The counties and towns have built out of their own treasuries 450 more miles, which brings the total mileage of improved roads for the State up to 900. These roads cost at first about \$6,000 per mile, but on account of the reduction in the price of materials and the increase of labor-saving machinery the cost has been reduced to about half this amount. The farmers, who at first strongly opposed the law, are now equally enthusiastic for it, and more roads are being petitioned for than can possibly be built in many years out of the limited State appropriation. The system seems to be popular with all classes, and it is being carefully considered by the legislatures of other States. Its principles have been adopted by Massachusetts, Connecticut, Rhode Island, New York, and California. These laws, of which State aid is the principle feature, are regarded by the active advocates of road reform as affording a satisfactory solution of the problem.



FIG. 1.—TYPE OF ROAD IN NEW JERSEY BEFORE IMPROVEMENT.



FIG. 2.—TYPE OF ROAD IN NEW JERSEY AFTER IMPROVEMENT.



FIG. 1.—TYPE OF ROAD IN MASSACHUSETTS BEFORE IMPROVEMENT.



FIG. 2.—TYPE OF ROAD IN MASSACHUSETTS AFTER IMPROVEMENT.

Massachusetts, like New Jersey, also has adopted a system of road improvement which, it is believed, will result in a few years in securing to that State highways that will be second in excellence to none in the United States and equal to some of the best in the Old World. The State has a permanent highway commission, consisting of three persons. Each year this commission is allowed to spend \$600,000 for building and maintaining roads, which are called State roads. The law provides that not more than 10 miles of road can be built in any one county in a year and that within six years after the construction of any State road the county in which the road is situated must pay to the State one-fourth of the money expended. Nearly 300 miles of excellent roads have been built in Massachusetts under this new system, the average cost per mile of which was about \$9,000. (Pl. XVI.)

Connecticut has made rapid progress in building highways during the last five years. It now has a highway commission, which was provided in 1895-96 with \$450,000 and in 1897-98 with \$400,000 for road improvement. In 1895-96 the State paid one-third the expense of constructing the roads, the town one-third, and the county the remainder, but in 1897-98 the State increased its part of the expense to one-half, the other half being borne by the towns. The amount of work accomplished is shown by the fact that in the two years last named the entire State appropriation was applied for by the towns, and this was done without any county assistance.

Although the Rhode Island commissioner of highways does not favor State aid, as adopted in the adjacent States, the legislature has at his suggestion passed a law which enables him to build a half-mile sample of good macadamized highway in each town. These permanent object lessons are of great benefit to the towns where good highways have not been built, and are conducive to more liberal appropriations for new roads, as well as more thorough construction, when the local authorities choose to carry the work forward. Out of 2,240 miles of highways in Rhode Island, about 500 miles have been improved by the use of gravel or stone.

The legislature of New York passed a bill last year which provides that the State's share in the improvement of highways shall be 50 per cent of the cost, the county's share 35 per cent, and the town's share the remainder. The boards of supervisors are given the right to decide what roads, if any, are to be improved, thus making the matter of road improvement entirely optional. No new offices were created, the State engineer being placed in charge of all road work. The law seems to give satisfaction; several miles of new roads have been built, and work is still in progress, under its provisions.

The legislature and people of California have not been idle in the work for good roads nor blind to the needs of the State in this respect. Up to a few years ago some of the convicts had been supported in comparative idleness at the expense of the State, while others had

been utilized in direct competition with free labor. In 1895 the legislature decided, at the suggestion of Gen. Roy Stone, to utilize convict labor in preparing road materials; a bill was passed providing for a highway commission and for the construction of a rock-crushing plant on one of the State prison grounds. Since that time the convicts have been turning out upward of 100,000 tons of crushed trap rock annually. Much of this material has been given to the counties as the State's contribution toward the improvement of the leading thoroughfares.

North Carolina, Delaware, Iowa, New Jersey, New York, Tennessee, and other States also have laws providing for the use of convict labor in improving the highways. North Carolina has made greater progress and has built more miles of roads under this system than any other State. Thus, one might, if space permitted, go through the whole list of States and find evidences of great progress in road improvement. Governor Mount, of Indiana, for instance, says that his Commonwealth is provided with 58,000 miles of graded, graveled, and piked highways, over 8,000 miles of which are comparable with the best roads of France. The public is now more thoroughly aroused to the importance of the movement for better roads than ever before, and more roads and better roads have been built in the United States in 1899 than in any previous year in its history.

The agitation which has become so universal will surely result in a well-defined public sentiment that will soon overcome all obstacles. With the new century, the good-roads movement is likely to receive valuable aid from the owners of horseless vehicles, already not uncommon on our thoroughfares. The aid of these new allies, added to that of the farmer, with his great pecuniary interest in the question, to say nothing of the army of wheelmen already enlisted in the cause, promises well for a rapid spread of the movement throughout the country.