UPON the keystone of the arch which so fitly symbolized the perpetual union of the thirteen original States, the name of PENNSYLVANIA was graven by our forefathers.

This great commonwealth was thus honored because of her geographical position, for while she held together the colonies to the north and the south, her boundaries also extended from the east, where the tides of the Atlantic wash her borders, westward to the shores of the Great Lakes. Although thus specially favored by nature, and notwithstanding the fact that the headwaters of the Susquehanna and Ohio rise in her midst, Pennsylvanïa, in the early decades of the century, was, on account of the rugged topography of the Allegheny mountains, placed at a serious disadvantage with her sister States in establishing a direct line of communication between the Atlantic seaboard and the newly-inhabited Western Territory.

I shall here record the history of the events which led the citizens of Pennsylvania successfully to surmount all natural obstacles by constructing the great iron highway, which, during a most eventful half-century, has developed the resources of the State and maintained the commercial importance of their metropolis.

The founders of the Republic feared that the Appalachian chain might prove a political, as well as a commercial, barrier to the perpetuity of the new nation.

Washington was apprehensive lest the difficulty of transport over the mountains might cause the pioneer settlers in the Ohio and Mississippi valleys to form new political affiliations detrimental to the continued union of the colonies.

Upon returning from a visit to some of the western settlements, Washington wrote to Benjamin Harrison, Governor of Virginia, on October 10, 1784:

"I need not remark to you, Sir, that the flanks and rear of the United States are possessed by other powers, and formidable ones, too; nor how necessary it is to apply the cement of interest to bind all parts of the Union together by indissoluble bonds, especially that part of it which lies immediately west of us.
"The Western States (I speak now from my own observation) hang upon a pivot. The touch of a feather will turn them any way. They have looked down the Mississippi till the Spaniards, very impolitically, I think, for themselves, threw difficulties in the way, and they looked that way for no other reason than because they could glide quietly down the stream; without considering, perhaps, the difficulties of the voyage back again, and the time necessary to perform it in; increased by them, and how amply we shall be compensated for any trouble and expense we may have encountered to effect it."

In another portion of the letter, which is a long one, urging the improvement of river navigation, Washington says: "There is in the State of Pennsylvania at least one hundred thousand souls who groan under the inconvenience of a long land transportation."

By the preliminary treaty of peace signed at Versailles, November 30, 1782, the territory and because they had no other means of coming to us but by land transportations and unimproved roads. These causes have hitherto checked the industry of the present settlers; for, except the demand for provisions, occasioned by the increase of population, and a little flour, which the necessities of the Spaniards compel them to buy, they have no incitements to labor. But smooth the road and make it easy for them, and then see what an influx of articles will be poured upon us; how amazingly our exports will be of the United States extended from the Atlantic ocean to the Mississippi river on the west, being bounded on the north by the Great Lakes and the St. Lawrence and St. Croix rivers, and on the south by Florida. To

1 Italicised by the author.
2 The final treaty, which was signed April 19, 1783, at Fontainebleau, was simply a ratification of this preliminary treaty.
3 See map showing boundaries of the United States, 1783.
CONSTITUTIONAL PROVISIONS CONCERNING TRANSPORTATION.

develop easy intercommunication between these diverse sections of our country, so varying in their interests, was of the highest importance to the growth and prosperity of the new nation.

During the five years (1783-1788) that intervened between the close of the war and the adoption of the Constitution, business was in a state of complete stagnation and the energies of the country seemed to be exhausted. The nation, as such, was penniless. The sacred debt due to the army for its patriotic and self-sacrificing service was in itself almost enough to bankrupt the treasury.

No satisfactory form of general government existed, the Articles of Confederation of 1781 having proved inadequate to the purposes for which they were framed. The labors of John Adams, as Minister Plenipotentiary to the Court of St. James in 1785, to obtain a fair commercial treaty with Great Britain, had been unsuccessful, that country refusing to remove the heavy import duty on American products, thus keeping them out of the English market, to the great detriment of our merchants and farmers. The land-holding class had hoped for an immediate and extensive immigration from the countries across the water, but these hopes were disappointed, and gloomy apprehensions universally prevailed throughout America.

The Constitutional Convention which met at the State House in Philadelphia, May 25, 1787, after sitting with closed doors for nearly four months, completed its labors when the Constitution of the United States was submitted to the several States, but the requisite number did not ratify the action of the convention until the following year.

Article 1 of the Constitution gave to the National Congress the power "to regulate commerce with foreign nations and among the several States," and "To establish post-offices and post-roads."

Section 9 provided that "No tax or duty shall be laid on articles exported from any State. No preference shall be given by any regulation of commerce or revenue to the ports of one State over those of another; nor shall vessels bound to or from one State be obliged to enter, clear or pay duties in another."

In these few lines are to be found the only provisions for the regulation of transportation contained in the Constitution which the great English statesman, Gladstone, pronounced "the most wonderful work ever struck off in a given time by the brain and purpose of man."

In the early times travelers who journeyed over the Alleghenies on foot or on horseback found the Indian paths "free from undergrowth, from the habit the Indians had of firing the woods in the fall."

A horse-path, impassable for wheeled vehicles, which led through the Juniata Valley and crossed the Allegheny Mountains at Kittanning Point, not far from the present line of the Pennsylvania Railroad, was for many years the most important route to the Ohio Valley and the lakes.

When the pioneer movements commenced in Southwestern Pennsylvania in 1764, trade over the mountains was conducted entirely by pack-horse, and this continued until the close of the Revolution. Salt, steel and iron castings were required in all the new settlements. These were only obtainable in the East, at that time pelts and furs were the sole resources of the pioneers, and every family collected as many as possible during the year for the purpose of sending them over the mountains for barter.

Monnet, in his instructive history of the Valley of the Mississippi, describes these interesting methods of conducting traffic by pack-horse: "It was customary in western settlements of Pennsylvania every fall for each little

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1 See section 8.

2 To transport a ton of merchandise by pack-horse from Philadelphia to Erie in 1784 cost nearly two hundred and fifty dollars.

3 Whiskey was then the circulating medium in all the towns and villages that lay along the banks of the Monongahela river. A gallon of "good rye whiskey" was the equivalent of a shilling piece until the close of the century.
neighborhood of a few families to dispatch a 'caravan' to the settlements east of the mountains. It consisted of a master, two or three young men and one or two boys, a few horses, with pack-saddles on their backs, stuffed bells on their necks, and a pair of hickory-withe hobbles attached to each pack-saddle. On each pack-saddle was secured a bag of shelled corn for provender on the way, to be deposited at convenient distances for the return route. A large wallet, well filled with bread, jerked bear's meat or boiled ham and cheese, contained the provisions for the drivers. Thus equipped, the cavalcade set out from the wilderness east of the Ohio. The path, scarcely two feet wide, and traveled by horses in single file, roamed over hill and dale, through mountain defile, over craggy steeps, beneath impending rocks, and around points of dizzy heights, where one false step might hurl horse and rider into the abyss below. To prevent such accidents the bulky baggage was removed in passing the dangerous defiles, to secure the horse from being thrown from his scanty foothold. This route, selected by experienced woodsmen, differed but little from that selected for turnpikes and railroads by professed engineers at a much later day. The order for the march, going and returning, was the same. The horses, with their packs, were marched along in single file, the foremost led by the leader of the caravan, while each successive horse was tethered to the pack-saddle of the horse before him. A driver followed behind, to keep an eye upon the proper adjustment of the packs and to urge on any horse that was disposed to lag: In this way two men could manage a caravan of ten or fifteen horses, each carrying about two hundred pounds' burden. When night came, a temporary camp and a camp-fire protected the weary travelers, while the horses, released from their burden, with hobbles on their feet and their bell-clappers loosed, were turned loose to graze near the camp."

After the close of the Revolution this method of traffic was continued. Five hundred pack-horses were sometimes assembled in Car-

lissle loaded with salt, iron and other merchandise. The bars of iron carried by the pack-horses were crooked around their bodies, and these "crooks," as they were called, made the frame of the pack-saddle, from which legs and bales were hung on either side, and a good business for those days was done by the blacksmiths in "crooking" iron and shoeing horses for the Western carriers.

The "diamond hitch," now extensively used among the packers of the West, appears to have been unknown before the invasion of California by the "gold hunters of '49."

Monnet states that "when wagons were first introduced, the carriers considered that mode of transportation an invasion of their rights; their indignation was more excited and they manifested greater rancor than did the regular teamsters when the line of single teams was started some thirty years ago."

The laws established in 1664, in force in Pennsylvania before the province was granted to William Penn, contain the following provisions for road-making:

"In all public works for the safety and defence of the government, or the necessary conveniences of bridges, highways and common passengers, the Governor or Deputy Governor and Council shall send warrants to any justice, and the justices to the constable of the next town, or any other town within that jurisdiction, to send so many laborers and artificers as the warrant shall direct, which the constable or two others or more of the overseers shall forthwith execute, and the constable and overseers shall have power to give such wages as they shall judge the work to deserve, provided that no ordinary laborer shall be compelled to work from home above one week together. No man shall be compelled to do any public work or services unless the press (pressment) be grounded upon some known law of this government, or act of the Governor and Council signifying the necessity thereof, in both which cases a reasonable allowance shall be made."

In 1678 the Upland Court of Chester County ordered every person "to make good
As early as roads leading from the north branch of the Susquehanna to Braddock, from Fort Duquesne, the work being done under the direction of General (then Colonel) Washington, who continued to improve and widen it during 1754-55.

In 1752 the Ohio Company opened up "Packers Path," following the buffalo and Indian trail from Wills Creek to the Alleghenies at the time of Braddock's defeat and was then abandoned.

In 1755, the Pennsylvania Assembly authorized the opening of a road to co-operate with Braddock, from Fort Loudon to Bedford, thence to Turkey Foot, where it was intended to connect with the Braddock road from Wills Creek. This had been constructed to the foot of the Alleghenies in 1760.

In 1758 a road from Bedford to Pittsburgh was built under the direction of General Forbes.

Rupp states that Conestoga wagons, named after that historic creek in Lancaster County, in the vicinity of which the powerful horses which drew them were first bred, were introduced as early as 1760.

In 1768 "emigrants having carts and oxen widened an Indian path," thus making the first road leading from the north branch of the Susquehanna in the direction of the Delaware River.

In colonial times Pennsylvania was better supplied with wagons than her sister colonies. As early as 1755 that colony, through the exertions of Benjamin Franklin, was able to contribute 150 wagons to Braddock’s expedition, and when, in 1780, General Washington made requisition upon the Council of Pennsylvania for 1066 wagons, the reply of President Reed gives evidence that the number of wagons in the State had continued to increase to the beginning of the Revolution.

"We are informed," says Mr. Reed, "that a further demand of teams to the amount of 1066 is to be made on this State. We should be wanting in duty to the public, as well as justice to your Excellency, not to take the first opportunity to inform you that we do not think it practicable to comply with it. The letters we receive from the wagon-masters assure us of the great difficulty in performing former orders. The number of teams in the State is greatly reduced. Lancaster County, which formerly registered 700, now does not register 500, and many of those are ordinary. Some of the other counties have declined in a greater proportion. We must intreat you to believe it is with real reluctance we decline any requisition, because we are persuaded you would not make any which you did not deem necessary, but we dare not mislead in points of so great consequence to give expectations where we have no solid ground to go upon.

The present resources and ability of this State are greatly exaggerated, whether through ignorance or design is not so material. The prices given in specie are the most undeniable proofs of it. The horses purchased by the French Commissary, though not of the first quality, have, on the average, cost £60 each. His wagons are engaged on a like scale. The justice of our remarks must appear more clearly when your Excellency recollects that the Army has been chiefly supplied with horses and wagons from this State during the War; that the most of them now attached to the army are drawn from this State. The quartermaster yesterday declared that half of all the supplies furnished the Army (imported articles excepted) had been drawn from this State for three years past."

1 Italicised by the author.
New Line Industry.

The subscribers beg leave to inform the public that they have erected a new line of STAGES, to start from Paulus-Hook, in a short time after the session of each day, except on Saturday, and proceed the same evening to Elizabeth-Town, and lodge at Mr. Witt's; start next morning at six o'clock; breakfast at James Drake's, in New-Brunswick, and dine at Charles Bellonette's, in Bristol.

The price for a passenger four dollars; 14 lb. baggage, gratis; small bags, the same as a passenger.

The proprietors have taken the precaution they mean to pay, to meet with that encouragement that may deserve from a generous public.

No more than eight passengers can be admitted in the New Line Industry, except by the particular desire of the company. Those parties and gentlemen who wish to travel with the New Line Industry, will please to apply for seats at Capt. Daniel Baldwin's, No. 49, St. John's-street, New-York.

Samuel Craig,    P. Shay,
Francis Witt,    James Drake,
John Voorhies,   Benjamin Gulick,
John M. Collon,   George Holcomb,
John Armstrong,  Michael Wartman.

M. R. Envy will be forwarded from this office at any time.

NEW-YORK, Printed by S. Loudon, Jun., No. 5, Water-street.

March 20th, 1792.
Before the Revolution nearly all the large settlements in America were upon the shores of navigable streams; only a few straggling settlements were located in the interior. In New York, Albany on the Hudson and Schenectady on the Mohawk; in New Jersey, Elizabethport upon the Passaic, New Brunswick upon Raritan Bay, Trenton, Bordentown, Burlington and Camden upon the Delaware, and New Castle in Delaware were growing villages. But in Pennsylvania there were many small inland settlements in Bucks, Chester and Lancaster counties. Lancaster, the first large inland town in America not connected with the seaboard by a navigable stream, had already become an important centre of trade. Harrisburg, known as Harris's Ferry for many years, though settled in 1726, was not laid out as a town until 1785. Pittsburgh was then a military post, "and dense forests and impassable morasses" covered the region between Harris's Ferry and Fort Pitt, "where rich deposits of iron and coal have since produced the Birmingham of America." As late as 1795 Cincinnati—Fort Washington—consisted of 95 log cabins with less than 500 inhabitants. St. Louis had been founded as a French trading post, though even the name of that city was known to but few Americans.

The country drained by the Ohio River was one vast solitude, and herds of buffaloes wandered over the rich plains which are now the granaries of Europe.

At this time no protection was exercised over the mails carried through long distances. Letters were opened, and the contents of packages removed and examined by the riders. To such an extent were the mails violated that, for a number of years after the Revolution, correspondence both between officials of the Government and business men was conducted in cipher. The few stage lines which had been established earlier in the century proved of great advantage to the development of New York, Trenton, Philadelphia, Lancaster and the adjacent country, but with the advent of the Revolution, wheel vehicles ceased to ply between these cities, traveling on horseback became common, and this condition of affairs existed during the whole of the Revolution. With the return of peace, stage wagons were again put upon the highway, but the traffic was inconsiderable for several years. From sixteen to eighteen hours were consumed in making a journey of thirty or forty miles. "One pair of horses usually dragged the stage some 18 miles, when fresh ones were put in." The traveler who reached his inn at 10 at night was "called at three in the morning and made ready by the light of a horn lantern or a farthing candle and went on his way over the worst of roads till 10 at night." When the coach was "stalled" in a quagmire or a rut, all of the passengers were required to alight and assist in righting the vehicle. The southern traveler then embarked in a sloop at the foot of Walnut Street, Philadelphia, sailed down the river to New Castle, then a thriving village, rode in the stage wagon across the peninsula to Frenchtown, where he embarked in another sail-boat for Baltimore, whose population, estimated in 1790 at 13,500, nearly doubled in the course of the next decade.

Engineering was in such a crude state that until 1795 no bridge had been erected in the United States over any important stream. The passage of the ferry over the wide river flowing between New York and Paulus Hook, now Jersey City, was always attended with discomfort and danger. Even on the short ferry from New York to Brooklyn there were many risks and delays, an hour being frequently consumed in crossing this narrow stream in a row-boat. The scows in which cattle and marketing were conveyed across

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1 Lancaster was incorporated as a borough June 19th, 1777, provision being made "to hold fairs for two days together in the months of June and October." The community was so prosperous that Franklin College was established there by the State authority in 1787.

2 The law erecting Dauphin county and establishing the county seat at Harris's Ferry was passed March 4, 1785.

3 The wooden bridge over the Delaware at Easton, renewed in 1895, was built in 1795.
these rivers were frequently overturned by the wind and tide. A few packet sloops conveyed passengers and merchandise between the towns located on the banks of navigable streams. No definite time was set for the sailing of these vessels, and the hour of arrival at their destination was a mere guess.

Such was the condition of affairs which stimulated Fitch, Runsey, Livingston and Stevens in their unsuccessful attempts to introduce steam navigation during the last years of the eighteenth century.

Among the events which were talked about in the coffee-houses of Philadelphia in the fall of 1795 was the arrival of the little undecked sail-boat—the Whitefish, eighteen feet long and six feet beam—which reached Market Street Wharf on the 10th of November, having come from Presque Isle (now Erie, Pennsylvania) all the way by water, except five portages aggregating 30 miles in length.

Two men had made the journey in her: John Thomson and David Lummis. They were both surveyors in the national domain in the Northwest Territory, and the former was afterwards the father of John Edgar Thomson, President of the Pennsylvania Railroad Company. The Whitefish had been built at Erie in the summer by Mr. Thomson and his comrade with a few imperfect tools, their timber being taken directly from the woods.

The boat had been launched on Lake Erie on the 22nd of September, and on its journey had passed the site of the present city of Buffalo and entered the Niagara river by a portage around the falls. Coming through Lake Ontario, the boat sailed eastward to the Oswego river, and thence by portages reached the headwaters of the Mohawk, and down the Hudson to the ocean, and along the New Jersey coast to Cape May, and up the Delaware river, the journey extending over 1,000 miles.

At this time transatlantic travel was seldom attempted, owing to the fact that from six to twelve weeks were spent in crossing the Atlantic in a small packet ship, with very dingy cabins filled with foul air. At the beginning of this century any person, except a seaman, who had been abroad, was pointed out on the streets as a curiosity, as "a man who had been to Europe."

In the proposals for a second settlement in the Province of Pennsylvania, published by William Penn in 1690, he suggested the practicability "of effecting a communication by water between the Susquehanna and a branch of the Schuykill."

In 1750, or thereabouts, the canals projected and in course of construction under Smeaton in England attracted the attention of the colonies. Brindley's success as a canal engineer for the Duke of Bridgewater was also fully appreciated on this side of the Atlantic.

In 1770, or earlier, the project of joining the waters of the Susquehanna and Schuylkill rivers by a canal was under discussion in the Province of Pennsylvania.

In a letter written by Benjamin Franklin to Mayor Rhodes, of Philadelphia, dated London, August 22, 1772, he said:

"With regard to your question whether it is best to make the Schuylkill part of the navigation of the back country, or whether the difficulty of that river subjects to all the inconveniences of floods, ice, etc.,

Jefferson, writing to a member of the ministry at the French court in 1790, states the time consumed in receiving letters from France to "average eleven weeks and a half; that the quickest are of nine weeks and the longest are of eighteen weeks coming." If an English paper was received five or six weeks after the date of publication it was regarded as remarkable.

It is stated that the first canal constructed within the present limits of the United States was a short line built in Orange county, N. Y., in 1750, for the transportation of stone from the quarries to the river.

The first charter under which large operations were prosecuted in America was granted January 5, 1785, by the Legislature of Virginia to the James River Canal Company, which constructed a canal around the falls of the James river to connect the city of Richmond with Westham, a thriving town located near the head of tidewater, a few miles below. The company also built a canal along the banks of the James river as far west as Buchanan.
I can only say that here they look on the constant practicability of a navigation allowing boats to pass and repass, at all times and seasons without hindrance, to be a point of the greatest importance, and therefore they seldom or ever use a river where it can be avoided. Locks in rivers are subject to many more accidents than those in still-water canals; and the carrying away a few locks by the freshets of ice not only creates a great expense, but interrupts business for a long time till repairs are made, which may soon be destroyed again, and thus the carrying a course of business by such a navigation be discouraged, as subject to frequent interruptions. The toll, too, must be higher to pay for such repairs. Rivers are ungovernable things, especially in hilly countries. Canals are quiet and very manageable; therefore they are often carried on by the sides of the rivers, only on ground above the reach of the floods, no other use being made of the river than to supply occasionally the waste of water in the canals. I warmly wish success to every attempt for improvement of our dear country."

Over sixty years, however, were to elapse before the Susquehanna was to be connected with the Schuylkill river at Philadelphia, and then it was to be by railway and not "a navigation." That railway was destined to become the first link in a great chain to connect the Atlantic seaboard with the Ohio Valley and the Great Lakes—the chain of transportation lines which have now become the Pennsylvania Railroad System.

Soon after the close of the War of the Revolution, public attention was directed to the importance of beginning and extending internal improvements. The necessity of bettering the navigation of the rivers Delaware, Schuylkill and Susquehanna was fully appreciated, as were also the advantages to be derived from the construction and improvement of the roads leading out of Philadelphia.

In 1784 the road between Philadelphia and Lancaster had been so much improved that stage coaches could make the round trip in three days, and in 1786 a mail route was established between Philadelphia and Pittsburgh "once a fortnight." Prior to this time mails were carried at intervals by travelers or by special pony express. In 1787 an act was passed by the Assembly for establishing a road between the Frankstown Branch of the Juniata river and the Conemaugh, over the mountains.

In a pamphlet published in 1795 entitled "An Historical Account of the Rise, Progress and Present State of the Canal Navigation in Pennsylvania, by direction of the President and Managers of the Schuylkill and Susquehanna and the Delaware and Schuylkill Navigation Company," there is recorded the first reliable information in regard to early canals in Pennsylvania. From this publication it appears that David Rittenhouse, Benjamin Rittenhouse, Timothy Matlack and John Adlum were, in 1770, appointed by the American Philosophical Society a commission "respecting the proper tract of the canal for the junction of the Schuylkill and Susquehanna, extending their prospects still further to the great plan now in operation, viz., the junction of the tide-waters of the Delaware with the Ohio and Western Lakes, but the dark and distressing period of the Revolution necessarily suspended all improvements of the nation in every part of America."

"The Society for Promoting the Improvement of Roads and Inland Navigation," was organized in Philadelphia in January, 1789, and the agitation of its objects by its members, who increased to over one hundred, residing in various parts of the State of Pennsylvania, led to immediate legislative action.

In March, 1789, the Assembly of Pennsylvania passed an act appropriating ten thousand pounds annually "For claims and improvements, opening roads, improving navigation and encouraging domestic manufactures." By the Act of September 28, 1789, a comprehensive plan for the improvement of navigation was inaugurated, and commissioners were appointed to view the navigable waters of the State: "1st, the Delaware, Timothy Matlack, Reading Howell and William Dean; 2d, the

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1 The Philadelphia and Columbia Railroad, built by the State of Pennsylvania, opened for traffic April, 1834.

1 It is stated that the first wagon-load over the Alleghenies was hauled in 1789, a distance of 140 miles; the round trip consumed one month, the rate charged being $3 per ton.
DIFFICULTIES IN REACHING PHILADELPHIA, 1790-1799.

river Schuylkill, Benjamin Rittenhouse and John Adlum; 3d, the Susquehanna, Bartram Gallbraith, Samuel Boyd and Thomas Hulings.” The President of the Assembly, in his message of February 9, 1790, recommended that especial consideration be given to the importance of improving these rivers, and the Assembly appointed a committee, whose services were conducted “with great diligence and care.” They reported that, in their belief, “these rivers might be made navigable with as little difficulty and expense as any in the United States.”

The importance of ascertaining the most practical method of forming a connection between these rivers and the Allegheny and Lake Erie was also dwelt upon in the report of this committee, who recommended that full examination of the narrow water-courses of the State be made with a special view of determining where portage by land would be necessary. The recommendations were adopted by the Assembly, and the Council appointed Timothy Matlack, John Adlum and Samuel McLay to examine the waters of the Swatara, Susquehanna, Juniata, Sinnamahoning and the Allegheny to its junction with the Monongaelse at Pittsburgh. Frederick Antes, William Howell and William Dean were made commissioners to perform similar services along the Lehigh and Schuylkill rivers.

The Congress of the United States, then in session in New York City, passed a bill, July 9, 1790, selecting the District of Columbia for the permanent location of the capital of the nation. This bill declared, however, that for ten years from the date of the close of the session the seat of the Government should be Philadelphia, where Congress assembled in December, 1790.

The difficulties in reaching Philadelphia during these ten important years in the history of the State and nation had much to do with developing that zeal for internal improvement which resulted in establishing the routes of communication, and which brought such great prosperity to the city of Philadelphia.

On the 2d of September, 1790, the Convention to frame a constitution for the government of the State of Pennsylvania completed its labors in Philadelphia. Thomas Mifflin had been elected the first Governor by a popular vote. The new Legislature met for the first time at the new State House on Chestnut Street on September 3d, 1790.

Soon after Washington’s first inauguration confidence in commercial affairs was revived by the action of the General Government in assuming the war debts of the several States and in providing for the redemption of the Continental paper currency at its face value, and the last decade of the century opened most auspiciously for the new republic.

At the date of Washington’s inauguration the population of the United States was nearly four millions (4,000,000), the centre of population then being located no farther west than Baltimore.

The roads throughout the country were in such bad condition that it was scarcely possible to establish trading towns except where they could be reached by water. In Pennsylvania, however, the inland town of Lancaster had thriven, and Philadelphia had developed an interior trade requiring the use of upwards of ten thousand great Conestoga wagons, each drawn by six or eight stout horses. Elsewhere, inland traffic continued to be carried on almost entirely with pack-horses.

The “Society for Promoting the Improvement of Roads and Inland Navigation,” early in 1791, addressed a memorial to the Legis-

1 Washington took the oath of office April 30, 1789, in New York City, at Federal Hall, on the site of the present custom-house in Wall street.

2 Alexander Hamilton, the first Secretary of the Treasury, established the credit of the Government by taking the ground that it was “the first duty of the country to pay its honest debts.” This principle prevailed also in Congress, which ratified his plan for the gradual payment of the national debt of $54,000,000. Of this far-seeing policy of Hamilton, Webster thus spoke: “He smote the rock of the national resources and abundant streams of revenue burst forth; he touched the dead corpse of public credit and it sprang upon its feet.”

3 Picture in Eggleston’s History, p. 205.
lature, in which its favorable opinion of canals is thus stated:

"By canals a people may be supplied with grain forage, fuel, materials for building, and also all other heavy and raw materials for manufactures, which otherwise would remain of little value, at a distance from the place where they are wanted, because of the great expense commonly attending their transportation by carriages, etc.; for a barge of a reasonable size, worked by two men and drawn by two horses, can transport seventy or eighty tons, which weight, by any other carriage, would have required forty men and about sixty horses. This calculation is made for the canals of England, where, by means of turnpikes, a level country and improved roads, land carriage has a great advantage over any land carriage that can for many years be completed throughout the greater part of the United States."

The urgent recommendations of Alexander Hamilton, then Secretary of the Treasury, favoring the establishment of a Bank, were approved by Congress February 25, 1791, and on that day a bill was passed granting a charter "To the President, Directors and Company of the Bank of the United States," with a capital of ten millions of dollars, the charter to remain in force until March 4, 1811, during which time no other bank was to be established by the General Government. The finances of the country were thus, for the time at least, placed upon a much firmer basis than ever before.

The committee appointed by the Legislature of 1790 submitted a report, February 19, 1791, stating that the Delaware river could be made an important channel for introducing the trade of New York to Philadelphia by building a portage of nineteen miles, together with two other short portages, the cost being estimated at £25,000.

In a supplementary report dated April 3, the committee recommended that a canal be built from Frankstown to Poplar Run, and that a turnpike from Philadelphia through Lancaster to the Susquehanna be contracted for at once. A committee consisting of Dr. M. Smith and Timothy Matlack was appointed to repair to the Summit ground near Lebanon and finally to re-examine the levels, to ascertain the exact route of the canal, the sources and quantity of the waters which could be brought to supply the reservoir on the Summit and the locks at each end, with an account of the lands and waters necessary to be purchased as the great basis of the work."

This was a period when peace reigned and money was plenty and when investments in the stock of companies organized for constructing public improvements of all kinds were popular with capitalists. In the eight years after the close of the Revolution trade had increased so rapidly that the packet-boats were taxed far beyond their capacity, the wharves being filled with bales and hogsheads awaiting transportation. The year 1790 had been a seasonable one for the farmer, and the highways were cut to pieces by the continual passage of long trains of farm-wagons and ox-carts. The mails increased so rapidly that the postmasters and post-riders were "overwhelmed by the number of letters" which were committed to their care for delivery.

At this date there were only four banks in the United States. Ten years before, and only a few days after the surrender of Cornwallis at Yorktown, the Bank of North America, the first bank in the United States, had been organized through the influence of Robert Morris, the patriot who rendered such signal financial service to the country during the Revolution, pledging his personal credit to raise funds to pay the Army at that period of dire distress when, for the lack of money, the colonial troops would have disbanded. The banks at Philadelphia, Boston, New York and Baltimore had been prosperous from the time of their organization.

1 The same committee was also instructed to level and lay out the Conewago Canal, and finished its work in July, 1792.

1 One million nine hundred thousand dollars were collected by the custom-houses in the year 1791.

1 The Bank of North America, in Philadelphia, chartered December 31, 1781; Massachusetts Bank, in Boston, chartered February 7, 1784; the Bank of New York, in New York City, chartered June 9, 1784; and the Maryland Bank, in Baltimore, chartered February 7, 1790.
PENNSYLVANIA APPROPRIATES FUNDS FOR INTERNAL IMPROVEMENT.

On the morning of July 4, 1791, the Bank of the United States, organized by Congressional enactment, opened its books at Philadelphia for subscription to its stock. Five thousand shares were taken by the Government and twenty thousand shares were offered for sale, and so great was the desire to invest in these securities that twenty-four thousand shares were subscribed before the books had been opened fifteen minutes. With such evidences of prosperity on every hand, it was not difficult to obtain funds for the construction of roads and canals, the favorite stock for investment being what was called “Canal and Lock Navigation.”

Among the appropriations made by the Legislature in 1791 were the following: (a) “For the improvement of the Delaware, Lackawanna and Lehigh, and a road from the Delaware to the Susquehanna, near Great Bend, three thousand six hundred and fifty pounds.” (b) “For improving the Schuylkill and a road from Reading to Harrisburg, two thousand pounds.” (c) “For the Susquehanna, from the mouth of the Swatara to the Juniata, from the Juniata to the West Branch, from the West Branch to the Starruca and Great Bend, one thousand and forty pounds.” (d) “For the West Branch from the mouth of the Sinnemahoning to its north branch, thence to Driftwood; for a road from Driftwood to the Allegheny, twenty-three miles; from the Allegheny to the Conewango, French Creek, and a road from the latter to Presque Isle, on Lake Erie, two thousand one hundred and seventy pounds.” (e) “For clearing the Conewango Falls and down to Wright’s Ferry, five thousand two hundred and twenty pounds.” (f) “For the Juniata and its connecting roads and waters—from the mouth of the Juniata to Water street; from the latter to Franktown; thence by road to Poplar Run; thence by road to the Conemaugh, and a road from the forks of the Little Conemaugh to the mouth of Stony Creek, and for improving the Little Conemaugh, Conemaugh and Kiskiminetas to the Allegheny, ten thousand three hundred and ten pounds.” The Governor was also authorized to receive proposals for making sixteen roads in Berks, Dauphin and other counties leading toward the Allegheny Mountains. These were indeed liberal appropriations for that period, and entitled Pennsylvania to the claim that she was the first State in the Union to recognize the value of internal improvements.

Preparations were immediately made for carrying out these improvements, and in August, 1791, Governor Mifflin announced to the Legislature that he had already entered into certain contracts.

On the 6th of September, 1791, the “Society for Promoting the Improvement of Roads and Inland Navigation” presented a memorial requesting the Legislature to construct a canal to connect the Delaware and Allegheny rivers, to which that body replied: “That the Legislature, although animated by the warmest zeal for the improvement of the country, by means of roads and inland navigation, yet could not subject the finances of the States (even if adequate) to the burden of the whole; yet they would make liberal appropriation of public money for the improvement of such roads and navigable waters as, lying too remote from the more populous parts of the country, and the inhabitants but thinly settled, rendered it impracticable for them either to improve their own roads and waters by subscriptions or the usual county taxes; and the profits of the tolls would yet be too small to induce companies to undertake the work at their own expense; but that, in the more settled parts of the country, especially near the metropolis, they would be ready to incorporate companies for the gradual and progressive improvements of roads and waters where the tolls would be sufficient to recompense the subscribers or stockholders, and the charge would fall, according to justice, upon those who were to be benefited, in proportion to the use they might make of such roads and waters.” The Legislature having assumed this position, and times being prosperous, those interested in the improvement secured the passage of an act on September 29, 1791,
"to enable the Governor to incorporate a company to open a canal for lock navigation between the rivers Schuykill and Susquehanna, or by the waters of the Tulpehocken and Quitapahilla and Swatara, in the counties of Berks and Dauphin." By the provisions of this act Henry Drinker, Robert Hare, Joseph Heister, George Latimer, George Fry and William Montgomery were appointed commissioners to receive subscriptions to the capital stock of "the Schuylkill and Susquehanna Navigation Company," and the shares were eagerly purchased.

A capital stock of $400,000 having been subscribed, this company commenced work near Norristown in November, 1792, under the direction of Robert Morris, President, Timothy Matlack, Secretary, and Tench Francis, Treasurer.

It was also proposed that the water to be brought by the canal from Stony Creek should be used for the general supply of the city of Philadelphia.

Four thousand, instead of one thousand shares, of $400 each, having been subscribed for, the question of ownership of the 1,000 shares authorized was decided by lottery. April 10, 1792, the Delaware and Schuylkill Canal Company was incorporated with a capital of 2,000 shares of $200 each, the stock of which was promptly taken. Although these projects commanded such an unusual degree of public confidence, they were overwhelmed with disaster 1 after nearly half a million dollars had been expended without result. Their failure had such a discouraging effect on all canal projects that it was not until twenty years later, April 2, 1811, that the Union Canal Company was incorporated.

The Legislature of Pennsylvania adopted at an early date the following regulation to protect the earlier incorporated companies from competition: "By an article in each contract, the Government shall be restrained from laying out or establishing turnpikes or toll navigations, in a second instance, during (some specified number) years, which would destroy or diminish the income or revenue of turnpikes or toll navigations which they had established in the first instance."

President Washington was a practical surveyor and took the greatest interest in internal improvements. "During his official life he was careful to entrust work requiring engineering skill to educated and experienced engineers." It was by his direction also that all questions relating to the construction of canals and bridges, which arose early in his administration, were referred to engineer officers of the United States Army.

Andrew Ellicott, who had served as one of the commissioners in extending the Mason and Dixon line in 1784, and in running the western boundary line of Pennsylvania in 1785, was geographer-general during both of Washington's administrations, and was frequently consulted by the President and his cabinet in regard to all matters relating to the settlement of the Western Territory and the establishment of systems of navigation by the improvement of rivers and construction of canals. Washington was frequently in Philadelphia while President, and exerted his influence in favor of improving the routes through Pennsylvania, as did also his successor, John Adams, who, having been elected President, on the 4th of March, 1797, came to Philadelphia to be inaugurated.

During this year three important legislative

1In the language of Sherman Day: "It was in the river bank at Norristown that the spade was set to excavate the first public canal in the United States. This was the old Schuylkill and Delaware Canal, intended to connect the two rivers and also to supply water to the city of Philadelphia. For this latter purpose the canal was to be taken to Philadelphia on the same level without a lock. After completing some fifteen miles of the heaviest sections and the expenditure of about $400,000, the undertaking was abandoned; the principal stockholders themselves being involved in the difficulties. The company was afterward merged into the Union Canal Company and the Schuylkill Navigation Company. The ancient excavation still remains below Norristown."—Historical Collections of Pennsylvania, Philadelphia, 1843, p. 499.

1In 1801 the office of Surveyor General of the United States was created, and Ellicott was appointed to the position.
bodies were assembled in Philadelphia—the Congress of the United States, the Legislature of Pennsylvania, and the Council of the city of Philadelphia—and in each of these bodies there were men interested in the extension of canals and roads, and the improvements of the main highways between the city of Philadelphia and all parts of the country.

In December, 1798, Benjamin Latrobe was elected engineer of the State Water Works by the Council of Philadelphia, and various methods of bringing a supply of water to Philadelphia by the construction of canals, which could thus serve a double purpose, were proposed and discussed.

Contracts for the construction of steam-engines and pumping machinery for the water works were shortly afterward entered into, and the plant was erected during the first years of the century at the intersection of Broad and Market streets, where the Public Buildings now stand.

The removal of the State capital from Philadelphia had been considered by several Legislatures. In February, 1795, the Lower House adopted a resolution in favor of removing to Carlisle, but the Senate failed to concur. In 1796 the House selected Lancaster, but again the Senate refused its assent. In 1798 a bill was introduced authorizing the removal of the seat of government “to a convenient place at or near Wright’s Ferry on the Susquehanna river,” when a motion to substitute Harrisburg for Wright’s Ferry was lost by a vote of 29 to 43. Finally, in 1799, it was declared by resolution that the increased population of Philadelphia made it necessary to remove the seat of government from that city, “more especially as of late a disease called the ‘yellow fever’ has raged at particular periods, so as to render it dangerous for the members of the Legislature to meet,” and Lancaster, which was connected with Philadelphia by an excellent turnpike, became the State capital by the provisions of the bill signed by the Governor, May 3, 1799, although in the House strenuous attempts were made to substitute Harrisburg.

The State Legislature met in Lancaster for the first time on the 3d of December, 1799, and within a fortnight the death of Washington, on the 14th of the month, was formally announced to both Houses.

The improvement of common roads, and the introduction of the turnpike, which made it practicable to transfer the burden from the pack-horse to the wheel-carriage, may be regarded as the first great steps in the development of modern systems of transportation both in England and America.

The Philadelphia and Lancaster Turnpike Company, incorporated by the Legislature in 1792, was the first turnpike company chartered in America. When completed, it was the only good road of any length in the United States. The charter was issued in prosperous times, and so great was the desire to subscribe to the capital stock that when the time came for closing the books the number of shares subscribed was three or four times the amount of sale. To avoid favoritism, the names of all the subscribers were placed in a lottery wheel, and the “lucky ones” whose names were drawn became the original stockholders of what was considered for years to be the best turnpike in the New World.

Scarcely had the benefits of the improvement to the country at large become apparent than the perversity of human nature, which so frequently attempts to block the wheels of progress, manifested itself in objections to the construction of this turnpike. No sooner had the work of grading been begun when public meetings were held at points along the line protesting against the exercise of the law of eminent domain, under which, by legislative enactment, the officers of the company were required to condemn the desired lands.

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1 It is interesting to note that when, in 1799, the Council of Philadelphia pledged the city property in order to obtain $150,000 for the construction of the water works, the Market street bridge and ferry were excepted.

1 The same plan was followed with regard to the over-subscriptions to the Schuylkill and Susquehanna Navigation Company, see p. 12.
In these attempts to prevent its construction, the opponents of the turnpike were joined by the truck farmers living only a few miles from Philadelphia, who feared that depreciation in the value of farm products would result when the agricultural lands thirty or forty miles distant should have become accessible to the city market.

Spirited printed addresses were issued by the friends and enemies of the turnpike company, containing many of the same arguments which characterized the discussions in the public prints half a century later, when the railroad companies met with similar opposition in the location of their lines.

With no experience to guide them, these early road-builders at first made many blunders. The gravel coating was washed away in many places between the boulders which formed the foundation of the road. Injuries to horses and damage to wagons were frequent until the problem of drainage was mastered through the employment of an English foreman who had built roads in Great Britain on the McAdam plan.

During the construction of the road the opposition of the farmers continued. A largely-attended meeting was held at the Prince of Wales tavern in May, 1793, when a set of resolutions was passed roundly abusing the Legislature for granting the company a charter. An address was drawn by the chairman, and published and distributed among the farmers, who feared that the competition by the Lancaster County farmers would deprive them of the monopoly that had been enjoyed at the High Street markets on Wednesday and Saturday of each week.

The friends of the road were not discouraged by this unlooked-for opposition. The building of the road went on, and, when completed, its early enemies became its fast friends as soon as they realized the advantages which had been gained. Francis Bailey, who made a tour of North America in 1796, spoke of this turnpike as a masterpiece of its kind. "It is," he wrote, "paved with stone the whole way and all gravel, so that it is never obstructed during the most severe seasons."

The tolls for wagons on the Lancaster Pike were governed by the width of the wheel-tire as well as by the number of horses attached, as will be seen from the following schedule of rates: "For every cart or waggon, whose wheels do not exceed the breadth of four inches, one-eighth of a dollar for each horse drawing the same; for every cart or waggon whose wheels shall exceed in breadth four inches, and not exceed seven inches, one-sixteenth of a dollar for every horse drawing the same; for every cart or waggon, the breadth of whose wheels shall be more than seven inches, and not more than ten inches, or, being of the breadth of seven, shall roll more than ten inches, five cents for every horse drawing the same; for every cart or waggon, the breadth of whose wheels shall be more than ten inches, and not exceed twelve inches, or, being ten inches, shall roll more than fifteen inches, three cents for every horse drawing the same; for every cart or waggon, the breadth of whose wheels shall be more than twelve inches, two cents for every horse drawing the same." In addition to the discrimination in tolls favorable to broad-wheeled wagons, the act of incorporation provided that "No waggon or other carriage with four wheels, the breadth of whose wheels shall not be four inches, shall be drawn along the said road between the first day of December and the first day of May following, in any year or years, with a greater weight thereon than two and one-half tons, or with more than three tons, during the rest of the year."

The capital of the Philadelphia and Lancaster Turnpike Company was originally $360,000, but a large proportion of the tolls each
year was required for completing the work. The expenditure of net earnings, which is generally regarded as a modern method of financing, was in this way resorted to at that early period for the completion of a transportation line. So eager was the Company to begin, that stage lines ran in 1793 and 1794 on the sections then finished.

In the spring of 1794 a stage line ran once each week from Philadelphia to Harrisburg by the way of Reading and Lebanon, and public attention was called to it by the following notice in Dunlap and Claypole's *American Daily Advertiser*:

Wednesday, May 21, 1794.

Starts from Mr. Abraham Sheridan's, on Race street, between Third and Fourth streets, Philadelphia, every Wednesday, by way of Reading and Lebanon, to Harrisburg, and arrive at Harrisburg on Saturday morning following. Start from Mr. Crabb's, inn-keeper, Harrisburg, on Monday and arrive on Thursday at Philadelphia.

The Reading stage starts from Reading, at John Whitmarr's, inn-keeper, on Monday and arrives at Philadelphia Tuesday morning. Then starts from Philadelphia on Friday morning at four o'clock, and arrives at Reading on Saturday morning. The greatest care and attention shall be paid by the public's humble servant.

May 3, 1794. WILLIAM COLEMAN.

In 1798 the Legislature of Pennsylvania granted Abraham Witmer "the right to erect as his private property" a bridge over the Conestoga near Lancaster, which formed a part of the line of the turnpike, a special toll being collected from all who passed over it.

Traffic on the Lancaster turnpike in the year 1828 is thus described by Mr. W. Hasell Wilson in his valuable paper "Reminiscences of a Railroad Engineer," published in the Philadelphia *Railway World* of November 30, 1895:

In addition to several lines of stage coaches for passengers, large covered wagons (commonly designated Conestoga wagons), drawn by four, five or six horses, were constantly passing, loaded with freight; they generally traveled in groups of several teams, and from any eminence on the road on a winter's day, one or more of these groups were in sight at a time. The length of the daily journey was usually from twenty to twenty-five miles, and there were taverns at every mile or two for the accommodation of men and horses. The wagoners carried a few articles of bedding which they spread out at night on the floor of the tavern bar-room. The horses were unharnessed, and hitched on each side of the wagon tongue, upon which a feed trough was placed; each wagon carried its own trough, but the feed was purchased from the adjacent farmers, who thus found a ready market for their products almost at their very doors. The fear of losing this market had a great effect in causing opposition to the railroad by the farmers in the eastern part of the State, as they were told that a much less number of horses would be required on the railroad. Steam power was not then mentioned.

The result of Oliver Evans's experimental steam land and water machine led him later to propose the construction of steam wagons for use upon the Lancaster turnpike.

Writing in 1809, he said: "Some wise men undertook to ridicule my experiment of propelling this great weight on land because the motion was too slow to be useful. I silenced them by answering that I would make a carriage to be propelled by steam, for a bet of $3000, to run upon a level road against the swiftest horse they would produce. I was then as confident as I am now that such velocity could be given to carriages. . . . On the 25th of September, 1804, I submitted to the consideration of the Lancaster Turnpike Company a statement of the cost and profits of a steam carriage to carry 100 barrels of flour 50 miles in 24 hours. . . . tending to show that one such steam-engine would make more net profits than ten wagons drawn by ten horses each on a good turnpike road, and offering to build such a carriage at a very low price."

At the close of the century, the country being in a state of peace and the national credit finally established, attention could be given to the development of the Atlantic States, whose resources were entirely unknown.

Anthracite coal had been discovered at Mauch Chunk, in Pennsylvania, in 1791, but its value was so little understood, and so
limited were the facilities for transporting it to market, that it was largely used for repairing holes in the public roads.

Cotton, first introduced into Georgia, and planted there in 1786, had proved so well adapted to the soil of the Southern States that they were proclaimed the finest cotton-producing lands in the world, but the separation of the seed from the cotton-boll was slow and required the services of one hand for a whole day to prepare one pound for spinning.

Watt's pumping-engine had been improved, and, by the genius of Arkwright in England, adapted to the driving of machinery for spinning flax. Eli Whitney, of Massachusetts, had, in 1793, conferred a boon upon humanity by his invention of the cotton-gin. By this ingenious machine one man could do the work that before had needed many in removing the seed from the fiber, which, by a single operation, was thus prepared for spinning, and cotton-thread could be made ready for the loom at a much less cost than flax. Cotton was thereupon the source of enormous wealth to the South, and the cities of Savannah and Charleston rapidly increased in population and commercial importance.

All textile machinery was now so rapidly improved that "England could weave clothing for the world, and America was prepared to furnish all the raw material that English looms required."

Important as the eighteenth century had been to the city of Philadelphia, and, indeed, to the entire State of Pennsylvania from a political point of view, the nineteenth century was destined to bring greater results, through industrial development. Although by the removal of the national capital, Philadelphia had seemed to lose much of her prestige, her diverse interests did not, as might have been expected, permanently suffer.

To Pennsylvania, as already shown, belongs the honor of building the first turnpike in the land—the road leading from Philadelphia to Lancaster, completed in 1794, at a cost of $450,000.

This State was also in the first decades of the century unrivaled in the number, magnitude and boldness of design of her bridges. The bridge across the Schuylkill at Philadelphia for many years was regarded as the most notable structure erected over an American river. In Pennsylvania, also, the first permanent railroad in America was laid in 1809.

It was on the 13th of October, 1800, in the presence of the Mayor, City Council and other important bodies, that the corner-stone of the permanent bridge across the Schuylkill was laid with great formality, and on New Year's Day of 1805 it was formally opened to travel and recognized as the first link in the great chain which was to connect Philadelphia with the West. The Susquehanna had been bridged near Wrightville in 1793, and the river Delaware at Trenton in 1798. At Northumberland, Columbia and Harrisburg bridges were completed in 1809, and a year later one over the Monongahela at Pittsburgh.

A meeting of influential citizens, which resulted in the formation of "The Pennsylvania Improvement Company," took place in the District Court room in Philadelphia on the 1st day of January, 1802. The objects of the company were to improve inland communication and for banking. Thomas Leiper, chairman, Guy Bryan, A. J. Dallas, Wm. Devitt, Samuel Clark, Samuel Carswell, John Hunn, Andrew Pettitt and James Vanuzen, were appointed a committee to secure subscriptions and to promote its objects. As one of the results of the formation of this association, a company was incorporated on the 24th of March, 1802, to build a turnpike "From Front Street through Frankfort and Bustin town to the Morrisville Ferry, Bucks County," with the understanding that company would build a bridge across the Delaware river from

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1 Among the last acts of the Congress at Philadelphia was the passage of a resolution that the 22d of February, 1800, should be solemnly observed throughout the whole United States to commemorate by appropriate exercises the high esteem of the nation for the virtues of Washington, and the birthday of Washington has ever since been thus commemorated.
Morrisville to Trenton, according to the plans of Timothy Palmer, who had the contract for the bridge across the Schuylkill at "High" (Market) Street.

In the Harrisburg Guardian of September 24, 1803, Charles Burch announced:

That he has commenced running stages from Harrisburg through Lebanon to Reading. Passengers going this way can go through to Philadelphia without delay. Every Saturday morning, at 10 o'clock, he will start from Zeigler's Tavern, and arrive in Reading on Sunday. On Monday, stage starts from Reading and arrives in Philadelphia same day. Terms of passengers, $2.50 to Reading, and from thence to Philadelphia $3.00; 150 wt. baggage, the same as a passenger.

During the session of the Pennsylvania Legislature at Lancaster, in 1804, an effort was made to secure the extension of the turnpike from that city to Pittsburgh, but the project failed. In August, 1804, the first regular line of stages from Philadelphia to Pittsburgh was established. The stage-coaches left Tomlinson's Hotel, on Market Street, weekly, on Friday mornings. The proprietors agreed that the journey should not exceed seven days. The fare was $20 per passenger, who was allowed twenty pounds of baggage free, and extra baggage at the rate of twelve cents per pound; the cost of meals en route was $8.21 additional.

The following advertisement is from Poulson's American Daily Advertiser, June, 1804:

A contract being made with the Postmaster-General of the United States for carrying the mail to and from Philadelphia and Pittsburgh in stage wagons, a line of stages will be in operation on the first of July next on same route, which line will start from John Tomlinson's Spread Eagle, Market Street, No. 205, Philadelphia, and from Thomas Ferree's, the Fountain Inn, Water Street, Pittsburgh, and PERFORM THE SAME ROUTE IN SEVEN DAYS from each of the above places. PASSENGERS MUST PAY 20 DOLLARS EACH, WITH THE PRIVILEGE OF 20 POUNDS OF BAGGAGE, all above that weight, or baggage sent by said line, to pay at the rate of 12 dollars per 100 lb. if the packages are of such dimensions as to be admissible for conveyance. The proprietors of this line of stages well knowing the arduous undertaking of a new establishment, and aware of the laborious task and expense, and what the prosecution of their necessary engagements will require, are determined that their conduct will be such as they trust will be sanctioned by a discerning public and receive their support.

Printed cards will be distributed and may be had at the proprietors' different stage houses, giving a full detail of the distance and times of arrival at the several towns through which this line shall pass. Printers who shall think the above establishment a public benefit, will please to give the same a place in their respective papers a few times.

The road built in 1800-01 between Milesburg and Waterford was "for years the only road crossing the Alleghenies above Kittanning."

In the Oracle for April 16, 1806, appeared the following advertisement:

NEW STAGE LINE.

Harrisburgh, Clark's Ferry, Meeterstown, Thomspontown, Mifflintown, Lewistown, Waynesburg, Huntington and Alexandria: Mail stage, once a week, to start every Tuesday, at one o'clock P. M., from the public house of Andrew Benghill, in Harrisburgh, and arrive at Alexandria the Friday following. The fare of passengers from Harrisburgh to Alexandria $6, with the privilege of 14 lbs. of baggage. Way passengers 6 cents per mile.

The failure of Congress in these years to appropriate funds from the National Treasury was not caused by lack of patriotism or in-appreciation of the advantages to be gained by binding the country together by the ties of interest created by the development of interstate commerce. It was the fear of violating the Constitution that led the statesmen of this period to close the public purse when propositions to build extensive roads or canals were brought before them.

The omission by the framers of the Constitution of the United States to give to Congress the power to construct and establish other highways than "post roads" proved a serious drawback to our national development during the first two decades of the century in which the steamboat was invented and put in practical service on almost every navigable river in America.

President Jefferson in his message to Congress dated December 2, 1806, thus discusses
the question of applying the surplus revenue to internal improvement:

To what other objects shall these surpluses be appropriated, and the whole surplus of impost after the entire discharge of the public debt, and during those intervals when the purposes of war shall not call for them? Shall we suppress the impost and give that advantage to foreign over domestic manufactures? On a few articles of more general and necessary use the suppression in due season will doubtless be right, but the great mass of the articles on which impost is paid is foreign luxuries purchased by those only who are rich enough to afford themselves the use of them. Their patriotism would certainly prefer its continuance and application to the great purposes of public education, roads, rivers, canals, and such other objects of public improvement as it may be thought to add to the constitutional enumeration of federal powers. By these operations new channels of communication will be opened between the States; the lines of separation will disappear, their interests will be identified, and their union cemented by new and indissoluble ties. . . . .

I suppose an amendment to the Constitution, by consent of the States, necessary, because the objects now recommended are not among those enumerated in the Constitution, and to which it permits the public moneys to be applied.

A bill was introduced in the Pennsylvania Senate in December, 1806, "authorizing the Governor to incorporate a company for making an artificial road from Harrisburg through Lewiston and Huntington to Pittsburgh," and after several weeks' discussion as to the adoption of that or another route, the bill was passed by the House and Senate and approved by the Governor on March 4, 1807, and on April 1 a supplementary act was approved authorizing the Governor to incorporate a company "for making an artificial road from the bank of the river Susquehanna opposite the borough of Harrisburg to Pittsburgh," the exact route being thus left to the judgment of the company as circumstances might demand.

In April, 1807, the Philadelphia and Lancaster Turnpike Company was made, by act of Assembly, a perpetual incorporation.

A contributor to the Aurora estimated that "the cost of each trip by a wagon to Pittsburgh and back was two hundred and fifty dollars, which amount could be very much lessened by the construction of a good road."

He suggested that wagons should be provided to run regularly to Pittsburgh, and urged the advantage that would result from the establishment of a line of packets on the Ohio between Pittsburgh and Louisville.

In 1808 the Farmers' and Mechanics' Bank of Philadelphia offered to subscribe $100,000 to the stock of the Northern Turnpike Company to Pittsburgh.

Large appropriations had been made by the Legislature of Pennsylvania for the improvement of roads and rivers during the years 1791 to 1808, and it was deemed important "that the public moneys should be faithfully applied to the objects to which they were designed." The Secretary of the Senate was, therefore, called upon to submit to the Senate a statement of contracts entered into between the Commonwealth and individuals for making and improving roads and improving the navigation of waters. The following abstract statement of such contracts under various acts of the General Assembly since April 13, 1791, was submitted by the Secretary of the Senate in pursuance of their resolution.

1 At this time, which was before the introduction of the steamboat, the time of passage from Pittsburgh to New Orleans was 20 to 25 days by boat.
### ROADS

The following contracts have been reported as completed.

<table>
<thead>
<tr>
<th>NAME OF ROAD</th>
<th>Date of Contract</th>
<th>Names of Contractors</th>
<th>Sureties</th>
<th>Sums Appropriated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wilkesbarre and Wind Gap</td>
<td>July 6, 1791</td>
<td>Joseph Horseford, Evan Owen, Michael Brobst, Wm. Kissel</td>
<td>John Hilborn</td>
<td>£500</td>
</tr>
<tr>
<td>From Keppinger's Mill on Little Schuylkill to the Susquehanna</td>
<td>July 11, 1791</td>
<td>John Murray, James Wells, John John.</td>
<td>John Sellers, Ben Brannon, Dan'l Stoy</td>
<td>300</td>
</tr>
<tr>
<td>From Middle Cr. to Hamburg</td>
<td>July 1, 1791</td>
<td>John</td>
<td>Jacob Erk</td>
<td>200</td>
</tr>
<tr>
<td>Stockfort on Delaware to Harmony on Susquehanna</td>
<td>Dec. 14, 1791</td>
<td>John Hillborn</td>
<td>Jacob Downing, Henry Drinker</td>
<td>£400</td>
</tr>
<tr>
<td>Harrisburg to or near Halifax</td>
<td>Nov. 1, 1791</td>
<td>John Murray</td>
<td>Archibald McAllister, John Carson, Wm. McDermott, Alexander McLean</td>
<td>600</td>
</tr>
<tr>
<td>McCownaghy's Run across Laurel Hill to Loyalhanna Cr. on Bedford and Pgh. Road</td>
<td>May 24, 1792</td>
<td>John Murray</td>
<td>John Wilson</td>
<td>£200</td>
</tr>
<tr>
<td>Philadelphia through BloxleyTp. to County Line</td>
<td>July 13, 1792</td>
<td>John Murray</td>
<td>John</td>
<td>300</td>
</tr>
<tr>
<td>Part of Pittsburgh Road between Stodler's Road and McConaghyls</td>
<td>Oct. 23, 1792</td>
<td>Abraham Witmer</td>
<td>John</td>
<td>250</td>
</tr>
<tr>
<td>Part of Harrisburg and Lancaster Road over Conewago Hills</td>
<td>Oct. 24, 1792</td>
<td>Jacob Dickey</td>
<td>Jacob Baker, John Turry</td>
<td>500</td>
</tr>
<tr>
<td>Pittsburgh Road from east side of Allegheny Mountain to Stodler's Run</td>
<td>March 18, 1793</td>
<td>Jacob Dickey, John Wilson</td>
<td>James Dickey, Jr., Danl. McConnel</td>
<td>£450</td>
</tr>
<tr>
<td>From Buchannon's through Great Cove to Silding Hill</td>
<td>April 23, 1793</td>
<td>Andrew Work</td>
<td>Ephraim Wallace</td>
<td>£200</td>
</tr>
<tr>
<td>Stoney Creek to Chestnut Ridge</td>
<td>Aug. 19, 1793</td>
<td>Ebenezer Brady, James</td>
<td>Thos. Boude, Andrew Graff</td>
<td>1064.20</td>
</tr>
<tr>
<td>Driftwood to Allegheny River</td>
<td>April 2, 1794</td>
<td>Alex. Scott</td>
<td>James Wilson</td>
<td>£450</td>
</tr>
<tr>
<td>From Pittsburgh by Franklin to Lebouff</td>
<td>April 7, 1796</td>
<td>Jas. I. Heron, Dunng McNair, David Mead</td>
<td>Wm. O'Hara, Benj. Burr</td>
<td>£400</td>
</tr>
<tr>
<td>Lewistown and Penn's Valley</td>
<td>June 8, 1798</td>
<td>Wm. Mead</td>
<td>Jas. Potter, Benj. Rust</td>
<td>400</td>
</tr>
<tr>
<td>Frankstown and Conemaugh</td>
<td>May 4, 1799</td>
<td>Morgan J. Rhee</td>
<td>Wm. Jones</td>
<td>800</td>
</tr>
<tr>
<td>Part of Frankstown and Pittsburgh Rd.</td>
<td>March 18, 1800</td>
<td>Jeremiah Murray</td>
<td>Michael Rush, Dunning McNair</td>
<td>£177 6 3</td>
</tr>
<tr>
<td>Another part of Frankstown and Pittsburgh Road</td>
<td>March 18, 1800</td>
<td>Jas. Wilson, Wm. Guthrie</td>
<td>Geo. Smith</td>
<td>123 10s</td>
</tr>
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### RIVERS

<table>
<thead>
<tr>
<th>NAME OF RIVER</th>
<th>Date of Contract</th>
<th>Names of Contractors</th>
<th>Sureties</th>
<th>Sums Appropriated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Youghiogeny from Mouth to Salt Lick Creek</td>
<td>Jan. 31, 1793</td>
<td>David Stewart, Isaac Meason, John Gibson, Chas. Campbell</td>
<td>Jas. Blackstone, Wm. Boyd</td>
<td>1200</td>
</tr>
<tr>
<td>Parts of Conemaugh and Kiskiminetas</td>
<td>Feb. 25, 1794</td>
<td>John Dennison</td>
<td>Wm. Findley</td>
<td>2700</td>
</tr>
<tr>
<td>Parts of Conemaugh</td>
<td>April 22, 1794</td>
<td>Jas. Brady</td>
<td>Wm. Findley, Abraham Hendricks, Wm. Henderson</td>
<td>350</td>
</tr>
<tr>
<td>Raystown Branch, Juniata</td>
<td>Feb. 18, 1798</td>
<td>Wm. Elliot</td>
<td>Wm. Henderson, Benj. Elliot</td>
<td>600</td>
</tr>
<tr>
<td>Susquehanna from Wright's Ferry to the Maryland Line</td>
<td>July 7, 1801</td>
<td>Frederick Antis</td>
<td></td>
<td>£12,126</td>
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</table>
The following contracts have been reported as not completed, and the bonds have been sent to the Attorney-General to be put in suit.

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<tr>
<td>Canoe Road.</td>
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<td></td>
<td>300</td>
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<tr>
<td>Jack's Road.</td>
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<td></td>
<td>120</td>
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<tr>
<td>Turtle Creek to Pittsburgh</td>
<td>June 10, 1795.</td>
<td>Wm. Smith.</td>
<td>Wm. Findley.</td>
<td>7500</td>
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<td>Part of Frankstown and Pittsburgh Rd.</td>
<td>March 10, 1800.</td>
<td>Wm. Smith.</td>
<td>Wm. Findley.</td>
<td>£51 5s</td>
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<tbody>
<tr>
<td>Juniata from mouth to Aughwick Falls.</td>
<td>5-8-1792.</td>
<td>S. Meredith. T. Francis. S. Miles.</td>
<td></td>
<td>£300</td>
</tr>
<tr>
<td>Monongahela.</td>
<td>12-17-1792.</td>
<td>T. Matlack. S. Powel.</td>
<td></td>
<td>£1200</td>
</tr>
<tr>
<td>Susquehanna between Swatara and Juniata.</td>
<td>7-31-1794.</td>
<td>W. Bingham. A. Witmer.</td>
<td></td>
<td>£800</td>
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The embargo of 1807 proved to be a serious blow to the development of transportation facilities in America. Business in the large shipping towns was almost entirely suspended. Sailors, draymen and ship-builders of all kinds were idle. Horses which had drawn the Conestoga wagon and hauled the stage-coach were put out in the fields to graze, and even the successful construction of the steamboats, which Fulton and Stevens had designed, and which had begun to run upon the Hudson and the Delaware, failed to stimulate trade. In Philadelphia, a number of seamen, bearing a flag, marched in procession to the State House, where they demanded relief from the mayor. The Philadelphia Chamber of Commerce was besieged by idle sailors, some of whom, through the philanthropic interest of the members, were put to work making canvas, rope, cords, mats, oakum, gaskets and points. The law of 1808 prohibited any boat of five tons or over from leaving any American port unless a bond for double the value of the boat and cargo be given that the vessel should land in the United States. All export by land was forbidden, and every wagon or convey-
DISASTROUS EMBARGO OF 1807.

Embargo, the fashion for wearing domestic goods prevailed throughout the country. The Pennsylvania Legislature resolved that every citizen should encourage domestic manufacture, and as example is more forcible than precept, requested the members to come to the next session clothed in fabrics woven in America. A similar resolution was introduced into the Kentucky Legislature by Henry Clay, and the Virginia Legislature requested its members to appear in homespun on the first day of December, 1809. North Carolina, Ohio and Vermont passed similar resolutions. In Baltimore the Union Manufacturing Company had opened its books for subscription in March, 1808, was conducting business on a capital of 10,000 shares of $50 each, which were taken as soon as offered. In Philadelphia, the Premium Society offered prizes for the best samples of various kinds of cloths and thread. In Charleston, South Carolina, The Homespun Company sold a thousand shares in one day. A mill for spinning cotton was established in Richmond, and another at Petersburg. The Petersburg Troop marched through the city on the 4th of July, 1808, arrayed in white Virginia cloth. In the larger cities associations were formed "for the encouragement of domestic manufacturing companies." These were joined by many men and women who considered it their duty to wear no clothing unless the entire raw material from which it was made was grown in the United States and the fabric made by American manufacturers. This was the origin of the great manufacturing interests which have since grown up in the Eastern, Middle

In 1807 and 1808, as a result largely of the embargo, the fashion for wearing domestic goods prevailed throughout the country. The Pennsylvania Legislature resolved that every citizen should encourage domestic manufacture, and as example is more forcible than precept, requested the members to come to the next session clothed in fabrics woven in America. A similar resolution was introduced into the Kentucky Legislature by Henry Clay, and the Virginia Legislature requested its members to appear in homespun on the first day of December, 1809. North Carolina, Ohio and Vermont passed similar resolutions. In Baltimore the Union Manufacturing Company had opened its books for subscription in March, 1808, was conducting business on a capital of 10,000 shares of $50 each, which were taken as soon as offered. In Philadelphia, the Premium Society offered prizes for the best samples of various kinds of cloths and thread. In Charleston, South Carolina, The Homespun Company sold a thousand shares in one day. A mill for spinning cotton was established in Richmond, and another at Petersburg. The Petersburg Troop marched through the city on the 4th of July, 1808, arrayed in white Virginia cloth. In the larger cities associations were formed "for the encouragement of domestic manufacturing companies." These were joined by many men and women who considered it their duty to wear no clothing unless the entire raw material from which it was made was grown in the United States and the fabric made by American manufacturers. This was the origin of the great manufacturing interests which have since grown up in the Eastern, Middle

From the four banks of America in 1791, the number had grown until in 1795 there were 20, and in 1800 they had increased to 27, in 1805 to 64, in 1810 to 103.
and Atlantic States, and their growth may be said to have begun at this particular period.

The famous Conestoga wagons which, for years, offered the only means of transportation between Philadelphia and the interior towns seem to have originated in Lancaster and Chester counties. The horses which dragged these vehicles through the mud and mire were of the far-famed Conestoga breed, which had originally been brought into Chester County by English settlers; but it was not until the Swiss Mennonites, who lived along the Conestoga Creek and the Pequi Valley, obtained the stock, that it was brought to the high state of perfection which has made the breed famous throughout America. The great vehicles they drew had a capacity of three or four tons. The white covers, high at each end and low in the middle, gave to them the characteristic and peculiar appearance which is never forgotten by those who witnessed them passing along the road or who have seen their representations either on painted canvas or paper.

Hon. John Strohm, in an article on the Conestoga horse, contributed to the United States Agricultural Report for 1863, says:

The immigration to and settling of the Western States created a demand for the transportation of large quantities of dry goods and groceries to supply the wants of those engaged in opening up and settling these new countries; and many farmers in the Conestoga valley occasionally employed their teams in handling "store goods" from Philadelphia to Pittsburgh, the latter place being the terminus beyond which Eastern teams seldom went. During the war of 1812 these noble teams rendered essential service to the country in the transportation of arms and ammunition, and supplies to the army on the frontier. Long lines of these teams were frequently seen wending their weary way to the theater of action, and contributing greatly to the comfort of the army and the defense of the country. Their usual route of travel was from Philadelphia through Lancaster, crossing the Susquehanna at Columbia or Marietta, and thence over the mountains to Pittsburgh, and sometimes northward to Lake Erie. The capacious wagons which the Conestoga farmers then had in use, and the heavy teams of large, fat, sleek horses attached thereto, were the best means of land transportation which the times and circumstances of the country then afforded.

These wagons and teams attracted attention and commanded admiration wherever they appeared; and thence the origin, as I conceive, of the horse and wagon to which the appellation of "Conestoga" has been attached. The farmers of those days seemed fully to appreciate the importance of these teams, and evidenced a considerable taste and no little pride in their style of fitting them out. The harness was constructed of the best materials, with an eye to show as well as utility. In the harness and trimmings of these teams they frequently indulged in expenses that approached to extravagance. In addition to what was indispensably necessary, articles that by some were deemed decorations were sometimes appended, and served to increase the admiration which the noble animals to which they were attached so universally attracted. It was indeed an animating sight to see five or six highly-fed horses, half-covered with heavy bear skins, or decorated with gaudily-fringed housings, surmounted with a set of finely-toned bells, their bridles adorned with loops of red trimming, and moving over the ground with a brisk, elastic step, shaming disdainfully at surrounding objects, as if half conscious of their superior appearance, and participating in the pride that swelled the bosom of their master and driver.

The contrast between former times and those of the present may be strongly illustrated by the statement that before turnpikes were constructed "it required a good team of five or six horses from eighteen to thirty-five days to transport from 2,500 to 3,500 pounds of goods from Philadelphia to Pittsburgh. On the completion of the turnpike across the mountain, the load of a wagon was increased to 6,000 or 8,000 pounds, and the trip was made in twelve or fifteen days. The price of carrying varied from three or four to thirteen cents per pound."

Light vehicles were exceedingly scarce, in fact were almost entirely unknown before the Revolution. The gig, and the old one-horse shay with a seat just wide enough to accommodate two persons, were the types generally in use. The four-wheeled vehicle for passenger use was seldom seen, except in the neighborhood of the towns.

In a law relating to turnpike tolls passed in Pennsylvania in 1810, charges were authorized on "every sulky, chair, chaise, with one horse and two wheels," and on "every chair,
coach, phaeton, chaise, stage-wagon, coachee, or light wagon with two horses and four wheels." By a singular change in customs, which occurred some years later, the most important revenue of some of the turnpike companies subjected to similar provisions was finally derived from a class of vehicles not designated in the charters, viz., pleasure carriages of various kinds drawn by one horse and having four wheels.

The stage coach of the last century consisted of a square box-like body mounted on leather springs. The top was held in place by eight posts, and between each post hung a curtain of leather or canvas, which could be buttoned down when the weather was rainy or cold. Within were four seats, each to accommodate three passengers, and behind on the "boot" was carried the baggage, fourteen pounds being allowed free to each passenger. 1

When the stage was ready for the journey the driver sounded his horn, and the eleven passengers, who were allowed to select their seats in the order in which they had filed their applications, were summoned, their names were entered on the way bill, and each passenger took his seat with his face towards the horses. The traveler of to-day in a commodious Pullman car, riding at the rate of 60 miles an hour, has no conception of the discomforts of travel at this early period.

The Pennsylvania Magazine for January, 1893, contains the following interesting account of a journey to Pittsburgh by stage in 1808:

On Wednesday, September 14, 1808, we left Philadelphia, in the mail stage for Pittsburgh, with one through fellow-passenger, Mr. Bell, of Steubenville, Ohio, and two passengers for Lancaster, which city we reached at 5 P. M. After taking in two more passengers, the stage drove ten miles farther and brought us to a stopping place where we had comfortable quarters for the night.

Thursday, the 15th, we passed through Elizabeth-town, Middletown, and Harrisburg. We crossed the Susquehanna in twenty minutes. After a ride over excellent roads, which led through Carlisle and Shippensburg, we reached Chambersburg by nightfall.

Before breakfast on Friday, the 16th, we started on our passage over the first mountain range. For the next fifteen miles our stage-coach was drawn by six horses over rough and steep roads; it was dark when we reached our quarters for the night.

We started at 3 o'clock, Saturday morning, the 17th, and after a six-mile ride, crossing the Juniata, reached Bedford. Here we met Mr. and Mrs. Zachary Biggs, of Steubenville, on their wedding journey. They were accompanied by the bride's sister, Miss Wilson, of Chester County. All this day our journey lay across the Alleghenies, and we often got down from the stage to foot it, at places where the road was steep in ascent and descent. By 5 P. M. we reached Somerset, where we rested on Sunday.

Monday, the 19th, we made an early start, and by 5 P. M. reached Greensburg. On the road we met Henry Stauffer, in charge of four wagon-loads of "store-goods" for Pittsburgh merchants. It was court week and the town was crowded. An elephant was on exhibition. Here we were glad to meet our friend Mr. Ross, of Pittsburgh.

In spite of rain and rough roads we reached Pittsburgh by 5 o'clock Tuesday afternoon, the 20th. It is a lively place, and extensive business and manufacturing are carried on. We visited Mrs. Butler and her daughter, Mrs. Mason, and called on Mrs. Addison's family and took tea at her house.

In the latter part of the last century, navigation "up-stream" in the vicinity of Philadelphia was conducted almost entirely in Durham boats. This type of boat, which was made nearly in the shape of an Indian canoe, was first built about 1750 on the banks of the Delaware by Robert Durham, the manager and engineer of the Durham Furnace, in the northern part of Bucks County. Pearce, in his Annals of Luzerne County, says: "Durham boats were 60 feet long, 8 feet wide and two feet deep, and when laden with 15 tons drew 20 inches of water. The stern and bow were sharp, on which were erected small decks, while a running board extended the whole length of the boat on each side. They carried a mast with two sails, and were manned by a crew of five men, one steering, and four pushing forward with setting poles, two being on each side."
THE PENNSYLVANIA RAILROAD COMPANY.

But few of the States were able or willing to provide funds by taxation for the construction of the public works, and, since the general government, for constitutional reasons, refused to appropriate money from the national treasury for such purposes, it became necessary that the turnpikes and bridges to connect the more important towns should be built by private capital.

The money for these improvements was generally subscribed by the farmers or merchants, who were particularly interested in getting their crops to market or in reducing the cost of freight on such store goods and supplies as they were compelled to obtain overland.

The right to charter these turnpikes and bridge companies on routes crossing the boundaries between the States not having been conferred upon Congress by the Constitution of the United States, it devolved upon the Legislatures of the adjoining States through which the main highway passed to enact the necessary legislation.

The success of the Lancaster Turnpike encouraged capital to invest in like enterprises. The bridge across the Delaware at Trenton was begun in 1798; the “permanent bridge” across the Schuylkill at Market Street, Philadelphia, in 1800. During the first decade of the century, Pennsylvania had chartered thirty-three turnpikes, New Jersey thirty, Maryland capital had been invested in three turnpikes, which it was hoped would bring the trade from the Genesee and the West to Baltimore instead of to Philadelphia.

The cost of transportation was enormous. It cost a dollar to move a barrel of flour from Columbia to Philadelphia, seventy-four miles, by land. To bring it by the other route, down the Susquehanna to Branchville, over the peninsula to New Castle, and thence to Philadelphia by boat, cost seventy-five cents. The New Castle and Branchville Turnpike Company was then a most important avenue of commerce between Philadelphia and the Western and Southern States.

The rates paid for transportation over the twelve miles which separated the Chesapeake from the Delaware were enormous—six cents per bushel for wheat, twenty-five cents per barrel for flour, two dollars per hogshead for tobacco, and two dollars per ton for miscellaneous freight. To transport a ton overland from Philadelphia to Pittsburgh cost one hundred and twenty-five dollars. Five dollars was paid to move a hundred pounds of sugar between these points. An examination of the records shows that it cost ten or twelve cents to haul a ton of merchandise one mile over the wagon roads. The rates charged by the turnpike companies varied from two to five cents per horse for each ten miles, depending upon the number of horses attached to the wagon and the width of the tire of the wheels. To carry wheat or flour to a market over one hundred miles distant was almost prohibitory. The experience of the year preceding the second war with Great Britain indicated an entire absence of national feeling in the conduct of affairs. When peace was declared it became evident that some system of interstate-commerce must be established in order to unite the various States by a common bond of self-interest. The surveys for a national road leading from Cumberland to the State of Ohio had been completed in 1810, and the first ten miles from Cumberland west had been completed at the opening of the war. Numerous appeals made to Congress to establish systems of inland navigation had failed, since the appropriation of moneys for such purposes was regarded by the law-makers in power as unconstitutional.

A journey from the waters of the Chesapeake up to Philadelphia, over 500 miles, consumed eight or ten days. Anthracite coal sold for less in the Philadelphia markets than that brought from the Virginia coal-fields. A ton of merchandise could be bought for nine dollars, but this amount would not move a ton more than seventy or eighty miles overland.¹

¹Established by act of Congress, March 29, 1806.
²See the Journals of the Congress of 1806, 1809, 1810, together with Gallatin’s report in relation to the construction of canals.
Early in 1809 the chain bridge over the Schuylkill was finished, and on March 22 a company was incorporated to build a permanent bridge over the Schuylkill River, the capital being ten thousand dollars.

The first railroad in the United States was laid in Philadelphia in September, 1809, by Thomas Leiper. It was an experimental track, and was built in the large yard adjoining the Bull's Head Tavern, on 3d Street, above Callow Hill, in the section of the city then known as the Northern Liberties. The track was laid out by John Thomson, father of John Edgar Thomson, who was afterwards President of the Pennsylvania Railroad Company. Thomas Leiper had for several years been interested in a proposed canal from McIlvain's to Leiper's Mills, but opposition prevented its construction.

Satisfied with the result of his experiment at the Bull's Head Tavern, Mr. Thomson in May, 1809, made an estimate for a railway, to be built of wood, from his quarries in Delaware County, Pennsylvania, to the landing place on Crum Creek, about three-fourths of a mile distant. In the Aurora of September 27, 1809, the experiment was thus described:

We have the pleasure to inform the lovers of domestic improvements that a satisfactory experiment, at which we were present, was lately made in this city, by Mr. Thomas Leiper, of the great utility of railways for the conveyance of heavy burdens—an improvement which a few years ago was introduced into England—as in many cases a cheap and valuable substitute for canals. In the above experiment a railway was laid of two parallel courses of oak scantling, about four feet apart, supported on blocks or sleepers about eight feet from each other. On this railway, which had an ascent of 1½ inches in a yard, or 2° 23', a single horse, under the disadvantage of a path of loose earth to walk on, hauled up a four-wheel carriage, loaded with the enormous weight of 95½ hundredweight, or 1696 pounds.

We are informed that Mr. Leiper is about to lay a railway at Crum Creek, in Delaware County, for the conveyance of stone from his quarry to the landing, a distance of about one mile.

ROBERT PATTERSON,
CALLENDER IRVINE,
JOHN GLENN,
Agent for Thomas Leiper.

Being called upon by Thomas Leiper, Esq., to view his newly made truck-waggon fixed on the railway, of about twenty-one yards in length, for the purpose of making experiments, exhibited in the yard of the Bull Tavern, Northern Liberties, I took the exact acclivity of the said rail or draught way, and found it to rise at the rate of one inch and a half to the yard.

READING HOWELL, Engineer.
Philadelphia, July 31st, 1809.
The experiment having proved successful, Mr. Leiper at once contracted for the proposed road on Crum Creek. This was completed early in 1810 and continued in active use until 1828, when it was superseded by a canal. The draft of the road, made by John Thomson, civil engineer, is here reproduced.

A temporary railway about a quarter of a mile long had been used in Boston during the grading of Beacon Hill. Mr. Leiper's road at Crum Creek was, however, the first permanent railway in America.

"Virginia," said William J. Duane, in September, 1810, "is rivalling New York in improvement of canals, locks, etc., in the neighborhood of her capital and collieries, and I am told that railroads will also be very soon introduced."

In 1810, John Tomlinson & Co., of Philadelphia, and James Spanzler & Co., of York, established a line of stages to West Chester, Lancaster and Columbia, leaving the city on Mondays, Wednesdays and Fridays, and reaching Columbia the same night. These were among the first coaches in the United States to have steel springs. The fare to York was nine dollars and sixty cents.

In 1811 another attempt was made to establish canal communication between Philadelphia and the western and northwestern counties of the State. On April 2 the Union Canal Company was incorporated by the Legislature, and was authorized to construct railroads as auxiliaries to that work.

The preamble of the act states that the earlier companies had failed from various reasons to complete their works, and that the stockholders of the Delaware and Schuylkill and the Schuylkill and Susquehanna Canal Companies desired to form a joint stock company under the title of the Union Canal Company of Pennsylvania.

The act declared that all acts passed in favor of either of the companies were repealed, their corporate rights abolished, and that the corporations be united under the title of "The Union Canal Company of Pennsylvania."

Each holder of one share in the Schuylkill and Susquehanna Navigation Company was authorized to have two shares in the Union Canal Company stock, and each Delaware and Schuylkill Canal stockholder was to have one share. It was also proposed to make a contract to furnish the city of Philadelphia with water.

The Union Canal Company was also authorized "as soon as they may think proper, to extend their route to communicate with Lake Erie or other waters of any neighboring State by canal and lock navigation and turnpike on the same conditions, restrictions, franchises, immunities and provisions as are by this act granted, which are hereby extended to any canals, bridges, aqueducts, road works or other devices which may be set on foot or established by the virtue of this act."

The Legislature on April 2, 1811, passed an act "to encourage the constructing of certain great and leading roads, within this Commonwealth, and the erection of bridges over the Susquehanna at Harrisburg, Northumberland, Columbia and M'Call's Ferry, . . ." and $825,000 was appropriated for this purpose. The act provides that a commission "on the first Monday of May next, at the town of Harrisburg, shall proceed to view the several routes for which laws have been passed for making turnpike roads from Harrisburg to Pittsburgh," known as the northern and southern routes.

In 1812 the building of a road by way of Carlisle and Bedford to Pittsburgh was authorized. The State subscribed for 7,000 shares, and also assisted the northern route via Lewistown. On March 31 the Upper Ferry Bridge Company was authorized by the Legislature to build connecting turnpikes.
INTERNAL COMMUNICATION WITH THE WEST AND SOUTH.

from the Lancaster Road and the Wissahickon Road in order to open more direct routes to the bridge.¹

The Bank of the United States in this year applied for a turnpike charter and offered to subscribe $175,000 for a road from Harrisburg to Pittsburgh, and $50,000 for a bridge over the Susquehanna near Columbia, but the charter was not granted.

During the first ten years of the century a continuous stream of immigrants had been moving into the Ohio River valley. All of Southern Ohio had been peopled and Indiana had become a territory of the second grade. Immigrants in large numbers had invaded Kentucky and Tennessee. This condition of affairs introduced serious economic problems, for it was found impossible to raise sufficient revenue by taxes to construct roads and bridges or to improve the streams in order that trade might be successfully conducted between the villages growing up in the new country. Immediately after the beginning of the War of 1812, wheat and grain and flour rose rapidly in prices, and the fertile lands in the new Western States continued to attract thousands of farmers to that locality. The first steamboat which went down the Ohio in 1812 was the forerunner of that great fleet which for so many years conducted the rapidly-increasing commerce on the Mississippi River.

Gallatin, while Secretary of the Treasury, recommended the construction of a continuous turnpike along the Atlantic coast from Maine to Florida. He urged that improvements should be made in the Juniata, the Allegheny, the Monongahela and the Potomac,—the heads of navigation on these rivers to be chained by good roads over the mountains. His elaborate report, being referred to

¹ It required at this date a day and a half in a light stage coach to make the journey from Washington to Baltimore, and a fast mail wagon which made the journey "with surprising speed," left Pennsylvania Avenue at five in the morning and drew up at the post-office in Baltimore at eleven at night.

Congress, resulted in the passage of a bill which practically provided that the Government should subscribe to one-half of the capital stock of any corporation which might be chartered to construct the roads or canals suggested by Gallatin. A less propitious time for the promotion of transportation companies could scarcely have been chosen, for the embargo which had then been in force for several months had brought great financial distress upon the people. The attempt at Congressional aid failed. Madison, for constitutional reasons, would not sanction the construction of such works at the expense of the Government, and even Gallatin himself was compelled to admit that no money might be given for such enterprises. It was under this condition of affairs that Pennsylvania commenced to awaken from the lethargy of twenty years. New York was rapidly securing the trade of the Great Lakes and of Ohio. In 1811, in a remarkable pamphlet, William J. Duane, who had been Chairman of the Committee on Roads and Internal Improvements in the Pennsylvania Legislature during 1809 and 1810, issued an address to the people of Pennsylvania, in which he called attention not only to the indifference of the representatives, but of the people as well, to the development of the internal resources of the great Keystone State. Philadelphia, he said, once the foremost city in the land, had been passed by New York, and was being closely pressed by Baltimore. He urged that water communication between the Delaware and the Susquehanna be secured at once and that the canal be extended along the west branch of the Susquehanna to Lake Erie, and another by the north branch to secure the trade from the fertile valleys of Western New York. This appeal was not made in vain, for in 1811 the Legislature appropriated $250,000 to erect bridges over the Susquehanna at Harrisburg, one at Pittsburgh, one at Columbia and still another at Northumberland. $350,000 was appropriated for constructing a turnpike between Harrisburg and Pittsburgh, and $200,000 additional for a turnpike to connect the
Susquehanna at Northumberland with Waterford in the center of Erie County. It was the belief of the friends of the bill that when these bridges and roads were built, Philadelphia would control the Western trade and the trade of Pittsburgh, which, at that time, was the most prosperous of all the cities of that fertile valley of the Ohio, through which a continuous stream of population still continued to flow. It was the center of Western and Southwestern trade and immigration, and to it was brought from the East every article needed by the settler in the Southwest or to supply the emigrant for his journey.

In 1814, experiments with Schuylkill anthracite coal developed the fact that it was far superior to the bituminous coal brought from Virginia, and an article in Union and United States Gazette, December 14, 1814, gave an account of the successful experiment with anthracite coal in Pennsylvania, etc. The coal industry at this time was being rapidly developed. Charles Miner, in a letter written in 1833, thus describes the first experience of the firm with which he was connected in transporting Lehigh coal to Philadelphia in August, 1814:

The "Ark," 65 feet long and 14 feet wide (cost high from inconvenience of building), $130.00
24 tons coal—raising from mine................. 24.00
Hauling 9 miles to landing, at $4............. 96.00
Loading into "Ark".................................. 5.00
Expenses of passage and hands down and return ........................................... 28.27
Wages, including 3 pilots.................... 47.50
Total for delivering 24 tons of coal at
Philadelphia ..................................... $339.77
Per ton ........................................... 13.75

He adds, "I have been somewhat minute in giving these details, because this 'Ark' was the pioneer and led off the coal trade by the Lehigh to Philadelphia, now so extensive and important. This effort of ours might be regarded as the acorn from which grew the mighty oak of the Lehigh Coal Navigation Company."

The introduction on the Ohio and Mississippi of barges moved by sails when the wind permitted, and at other times by poles or oars, may be regarded as the first important event in the history of transportation in the Western States.

Vessels carrying from 50 to 100 tons could make two round trips from Cincinnati to New Orleans in a year. The charge of carrying freight was five to six cents per pound, and as full cargoes both ways were assured, fair remuneration was obtained. Farm products, tobacco, wheat and whiskey formed the cargo down-stream; these were exchanged for groceries, dry goods and manufactured articles at New Orleans, which were brought up-stream to supply the wants of the growing Northwest territory.

In February, 1812, John Stevens, of New Jersey, made public his views concerning the feasibility of applying steam to locomotion on land, and gave a minute description of his proposed railway and locomotive. At that time there were no locomotives in the world, and the only existing railroads were some short tram-roads, similar to the one already described at Crum Creek for carrying coal or stone, and upon which cars were drawn by horses. Mr. Stevens foresaw the possibilities of the improvements he suggested. "In a military point of view," he says, "the advantages resulting from the establishment of these steam carriages would be incalculable. It would at once render our frontiers on every side invulnerable. Armies could be conveyed in twenty-four hours a greater distance than it would now take them weeks, or perhaps months, to march."

"Thus, then, this improvement would afford us prompt and effectual means not only of guarding against the attacks of foreign enemies, but of expeditiously quelling internal commotions, and thus securing and preserving forever domestic tranquillity.

"Whatever constitutional doubts may be entertained respecting the power of Congress to cut and form canals, there can be none about the power to lay out and make roads. . . . "It appears to me calculated to hold out the most flattering prospects of gain to such enterprising individuals or companies as might be induced to embark in this object.
Tracks with rails on wooden posts, and stone pillars proposed by John Stevens, 1812.

Single stringer track (also called saddle railroad) proposed for rapid transit of U. S. mails, 1815-25.
JOHN STEVENS ADVOCATES A RAILROAD, 1812.

"But I consider it in every point of view so exclusively an object of national concern that I shall give no encouragement to private speculations until it is ascertained that Congress will not be disposed to pay any attention to it.

"Should it, however, be destined to remain unnoticed by the General Government, I must confess I should feel much regret, not so much from personal as from public considerations. I am anxious and ambitious that my native country should have the honor of being the first to introduce an improvement of such immense importance to society at large."

The railway Mr. Stevens proposed was to be of timber, "supported on pillars raised from three to five or six feet from the surface of the ground; the carriage wheels of cast iron, the rims flat, with projecting flanges, to fit on the surface of the railways; the moving power to be a steam engine similar in construction to that on board the Juliana, a ferry-boat plying between this city [New York] and Hoboken."

The following is an extract from a letter written by John Stevens, dated New York, January 28, 1813, to William S. Duane at Philadelphia:

Permit me to tell you that, since seeing you, I have been highly gratified by a perusal of your letter on internal improvement. The supineness of your Legislature respecting the navigation of the Susquehanna from Middletown upwards is truly astonishing. But the canal from the D. to the S. is a work of so great magnitude, and by the southern section of the State not, I should suppose, viewed as of much interest, especially the entire failure, too, of the former attempt made by the Commissioners; these circumstances, in addition to many others, will require the continuation of nerve (?), a portion of disinterested and enlightened patriotism not easily obtained in bodies constituted as our Legislatures. To bring forward at this time my railways and steam carriages, I see plainly would be premature. Fair experiment must be made before I can reasonably expect to inspire confidence. This I now pledge myself shall be effected before the next meeting of your Legislature. I have entire confidence that the result will prove completely satisfactory, and that I shall enjoy the pleasure of exhibiting the utility of my project on so magnificent a scale. A railway from Hamilton or Middletown to Philadelphia would shortly prove one of the most populous thoroughfares in the known world, and the tolls would be proportionately great. But, pardon me, I shall detain you no longer than to subscribe myself,

With the highest respect and esteem,
Yours,
JOHN STEVENS.

The almost total failure of the wheat and barley crops in America in 1811 caused such a scarcity of grain in England that the Corporation of London asked Parliament that the distilleries be closed, so that the consumption of grain might not increase the price of bread. Manufacture in England was almost entirely suspended, and the unemployed workmen of Nottingham, Birmingham and Sheffield went about in mobs breaking the spinning machinery, stocking frames, in fact, every kind of labor-saving machine, hoping in this way to reduce the facilities for manufacture and compel the employment of more hands. At Liverpool but one-third of the two hundred carts were employed upon the docks. Mills and factories were shut, merchants were embarrassed, and thousands of laboring men were brought to the verge of starvation.

In the early days of 1812, rumors that Congress would soon declare another embargo, as the last step prior to a war with England, were heard in all the American and English cities along the coast. Early in April, Congress passed an act laying an embargo for 90 days on all vessels within the jurisdiction of the United States, and on the 19th of June the President issued a proclamation declaring war with Great Britain. Fortunately for America, better crops were raised during the year 1812, which was in a year followed by the naval
victory of the Constitution over the Guerriere and the subsequent American victories upon the sea, which was followed in June, 1813, by the blockade of many of the American ports by English vessels. Perry's victory on Lake Erie was followed by the capture of the city of Washington and the burning of the Capitol in August, 1814, the raids of the English into Maryland and Pennsylvania during the fall of that year, the victory of Jackson at New Orleans in January, 1815, and the declaring of peace a few days afterwards, are events familiar enough to every American.

The blockade prostrated the coasting trade and was a serious blow to the commerce of the American seaports. The trade which had heretofore been carried on by vessels was now conducted entirely by land, so that when the spring of 1814 opened the roads leading from New York and Philadelphia and Baltimore were filled with a continuous procession of canvas-covered wagons drawn by horses or oxen. It is estimated that during this year four thousand wagons and twenty thousand horses and oxen were employed continuously in the summer season in this inland traffic.

During the summer, when the roads were at their best, the trip from Boston to Baltimore was made in 26 days, and from Baltimore to Augusta in 33 days. Two months were thus consumed on the road between Boston and Augusta. These were the circumstances that led to the establishment of the "horse marine," a doggerel of which period survived up to the time of our Civil War. Names were given to the "ships of the road," and logs were kept by many of the drivers, as in the case of ships, in which were entered the names of the other "craft" that were met upon the road, together with a description of the load; these were printed in the newspapers of the day under the heading of "Horse Marine Intelligence," and similar captions. The following was the song of the wagoners:

\begin{quote}
Ye wagoners of Freedom
Whose chargers chew the cud,
Whose wheels have braved a dozen years,
The gravel and the mud;
Your glorious hawbucks yoke again
To take another jag,
And scud through the mud,
Where the heavy wheels do drag;
Where the wagon creak is long and low
And the jaded oxen lag.
Columbia needs no wooden walls,
No ships where billows swell;
Her march is like the terrapin's,
Her home is in her shell.
To guard her trade and sailors' rights,
In woods she spreads her flag.
\end{quote}

This song was intended as a parody on the English song of "Ye Mariners of England that guard our Native Seas." The fact that during these years the highways and inland waters between New York, Philadelphia, Harrisburg and the West and South were thronged with wagons and boats filled with goods was one of the great arguments used by the promoters of canals and turnpikes during the years that immediately followed the war. In fact, the immense traffic between New Brunswick and Trenton during this period led to the granting of the first railroad charter in America by the Legislature of New Jersey on February 16, 1815, a few days before peace was declared. The embargo had a most serious effect upon the commerce of New England, and delegates were sent to Washington from a convention held at Hartford, threatening that those States would begin to open negotiations with foreign nations unless Congress consented to do so. The finances of the country were in a deplorable condition. All efforts to establish a National Bank at Philadelphia had failed, and within a few weeks after the capture of Washington in 1814, every bank along the sea-coast suspended specie payments. This action was followed by the banks at the close of the year 1814, the results of which were felt for several years after peace was declared. In this condition of affairs it is not to be wondered at that little effort was

1 McMaster, in his valuable discussion of the events of this period in History of the American People, states, Vol. 4, p. 218: "No distance was then too great, and hundreds of vehicles wended their way from Salem and Boston to Augusta and Savannah.

1 The ship bearing the treaty arrived in New York, February 11, 1815.
made to improve transportation facilities between Philadelphia and the West, notwithstanding the fact that the necessity for internal improvement had been so fully demonstrated during the war. The slowness of travel during this period, even in case of emergency, is indicated by the fact that Jackson's victory at New Orleans, on the 8th of January, 1815, was not known in Washington until the fourth of the following month, although messengers had at once ridden post-haste up the Mississippi Valley to carry the news. A courier who started on Saturday, February 11, from New York with the good news that a messenger bearing a treaty of peace from England which had arrived that morning, did not reach Washington until sundown on Monday, fifty-nine hours being consumed in traveling 230 miles.

During the War of 1812 (January 1, 1815) a tax was levied on all carts and harness not used for farming purposes solely, or for the transportation of goods and wares. It should be noted in this connection that, at this time, not even the wealthier citizens owned private carriages.

FIRST RAILROAD CHARTER IN AMERICA.

From 1812 to 1815 nothing had been done toward carrying out the plans proposed by Mr. Stevens, but in February, 1815, the Legislature of New Jersey passed an act to incorporate a company to erect a railroad from the river Delaware, near Trenton, to the river Raritan, at or near New Brunswick. This act was the first railroad charter in America. It formed the basis for similar enactments in Pennsylvania eight or ten years later.

The act1 of February 6, incorporating the New Jersey Railroad Company, is a lengthy document providing for many contingencies. James Ewing, Pearson Hunt and Abner Reeder are appointed "commissioners to receive subscriptions for erecting a railroad, passing or repassing, not more than four rods wide, from the river Delaware, near Trenton, to the river Raritan, at or near New Brunswick." The subscriptions were not to exceed five thousand shares of one hundred dollars each. The subscribers and stockholders were to annually elect a President and eight Directors. The President and Directors were given power to fix the time and place of their meetings, to appoint agents and servants, to fill vacancies, and make by-laws. John Rutherford, Mahlon Dickerson and Richard Allison were made commissioners to lay out the road, and they were given power to enter upon any land they may deem necessary. The road was to be built of either iron or wood for the running of the wheels, and the running part was to be fixed on a solid foundation. In case of disagreement as to value of land needed for the road, the owners were allowed such damages as an umpire shall decide. The road was not to obstruct public roads, but must provide causeways for passing over it. When the road was completed, or any part not less than ten miles, three disinterested persons were to be appointed by the Governor to fix the transportation rates. The company was required at the end of every ten years to render account of receipts and expenditures. Wilful damage to the company's property was punished by fine of three times the actual damage caused. The charter was made void if the road was not completed within ten years, or if allowed to decay or left impassable for two years after its completion.

In his proposals for this railway, Mr. Stevens describes its construction, the country to be traversed, and the expense of construction being carefully estimated.

The route afterward surveyed from New Brunswick to Trenton is practically the same right of way now occupied between those cities by the main line of the Pennsylvania Railroad from New York to Chicago.

The unpublished papers of Mr. Stevens having been placed at my disposal, I am able to state in his own words what were his views as to the possibilities of this road:

An intercourse between the two capital cities of New York and Philadelphia is very great and rapidly

1 Published in full in the Appendix.
The Pennsylvania Railroad Company.

increasing. From the heavy expense attending the transportation of goods and other commodities across the State of New Jersey, from the Delaware to the Raritan, the far greater part of the commerce between these cities was, previous to the war, carried on by water. The risk, uncertainty, and delays attending a voyage of three hundred miles, the greater part of which is on the open sea, along a dangerous coast, rendered it a very desirable object that this commercial intercourse should be carried on by means of a canal connecting the waters of the above-mentioned rivers.

From the geography of the intervening country, such a canal would of necessity be extremely circuitous, and the expense enormous. It is, therefore, very problematical whether the state of the population and wealth would ever, even at any further period, afford an adequate income on the capital requisite to accomplish such a work. But although the idea of carrying an improvement of this nature into effect must for the present, at least, be abandoned, fortunately, however, wooden railways hold out a complete substitute at one-tenth part of the expense.

The tract of country through which railways could be carried nearly on a straight line from one river to the other is comparatively level, not a hill of any consequence intervening, what is called Rocky Hill—a spur of which is passed over by the present turnpike road—terminating to the northward. The swamp also would be avoided, the course of the railways passing over a gravelly soil for the greater part of the way. . . .

The expense of double railways of cast-iron on the ordinary construction, though far short of that of a canal, would still be very great, certainly not less than fifteen or sixteen thousand dollars per mile; whereas those I now propose constructed of wood, would not exceed twenty-five or thirty hundred dollars per mile, and should it even (which I am confident it will not) be found necessary to put plates of iron on these wooden rails, it could be done for about three or four thousand dollars per mile, making the whole expense of such double railways about six or seven thousand dollars per mile, or less than one-half of that of cast-iron ones on the ordinary construction. . . .

Without calculating on the immense transportation now carried on between the Delaware and Raritan occasioned by the present war, we may estimate it in the ordinary times of peace as necessarily very great. New York, from its local advantages, must become ultimately the chief emporium of the European market especially; and should the risk, uncertainty and delays of a sea voyage be superseded by the substitution of a cheap and expeditious mode of internal communication, the major part of foreign goods for the supply of the Western country will be brought from New York. And as it is a well known fact that flour and other produce of the country uniformly bear an advanced price in the New York market, should the expense of land carriage be adequately reduced by means of railways, a large proportion of what comes down the Delaware would be taken across to the banks of the Raritan.

It would be superfluous to attempt to prove that the railway now proposed cannot fail to be immensely profitable even should a peace be made soon; but should the present war be protracted a few years longer, it would yield at least one hundred per cent. annually.

Whatever doubts may be entertained respecting the practicability of applying the power of steam to the propulsion of wheel carriages on railways, there can be none as respects horses. It is a well attested fact that upwards of fifty tons have been transported on an ordinary railway for several miles by a single horse. What then may we not reasonably expect may be done on a railway where scarcely any other source of resistance will remain except the friction between the axis and the hubs of the wheels, and, by means of friction wheels even this would be nearly done away with. . . .

One great object to be attained by the completion of the railways now proposed will be to crush most effectually all opposition in the transportation of goods and passengers between New York and Philadelphia. If an act of the Legislature of New Jersey is obtained (of which there can be little or no doubt) granting permission to carry said railways through the State in such direction as shall be most eligible, the exclusive privilege will be secured, not only during the term of the patents, but in all probability forever.

Estimate of expense per mile of the proposed railways:

- 4 rails 6 inches wide by 12 inches deep would make 2 cubic feet, at 15 cents per foot, is $1,584
- Posts, say 25 cents each, 4 rows at 12 feet apart 40
- Digging holes, setting posts, carpenter-work, etc. 900
- Capping of oaks on railways 200
- Incidental expenses 276
- Reducing hills to one degree 1,000

Total per mile $4,000

In a statement submitted to the members of the Legislature of New Jersey, and to the citizens generally throughout the State, accompanied by a new memorial for a railroad from Trenton to New Brunswick, in 1826, Mr. Stevens said:
BUSINESS REVIVAL AT THE END OF THE WAR, 1815

In February, 1815, the Legislature of this State were induced, at the solicitation of the subscriber, to pass an act of incorporation for forming a railroad between Trenton and New Brunswick. But the public mind was not yet sufficiently enlightened to induce moneyed men to embark their funds in a project then considered as wild and impracticable, and, of course, no subscribers could be obtained. A similar act was shortly after obtained by the subscriber from the Legislature of Pennsylvania, but, from the same cause, it was attended with a similar want of success.

In 1816 the first railroad on which self-acting inclined planes were erected was executed by Mr. Boggs on the Kiskiminetas River, in Indiana County, Pennsylvania.

When Madison issued the proclamation announcing peace, a new era dawned upon the United States, but it was not until the 10th of April, 1816, that the bill was signed by the President establishing the National Bank at Philadelphia, an institution which for a time improved the dismantled condition of the currency. The unsettled condition of the currency of that period is indicated by the report of the Treasurer of Pennsylvania, January 10, 1817, in which he states that while there were forty-eight legal banks within the State, there were also twenty-two illegal banks, and thirty-nine private individuals issuing "shin plasters." Bridge companies, turnpike companies and storekeepers were issuing thousands of these notes, in denominations ranging from five cents to two dollars in value.

The first real evidence of prosperity after the close of the war was the revival of shipping. The wharves presented such a scene of activity that hundreds of idle citizens flocked to the docks to cheer the sailors who were removing "Madison's nightcaps" from the masts of their vessels preparatory to a voyage.

The period of the War, although disastrous to American commerce, was favorable to the development of American manufactures. During those years it became the fashion to wear clothes made of woolen and cotton cloth produced from raw American material by American mills and factories.

With the return of peace, many hundreds of vessels laden with the manufactured goods which had accumulated in English warehouses during the years of the war, landed at Philadelphia and New York, where thousands of yards of textiles were sold at auction in the original cases, without having passed the doors of a storehouse. This condition of affairs, which continued during 1815 and 1816, led to the enactment of a tariff by Congress in June 30, 1816, for the "protection of American industries."

The distress among manufacturers at that time was great. At Pittsburgh, in the cotton factories, the flint glass factories, the wire mills and the manufactories of all small iron articles, the outlook was so gloomy that the citizens held meetings and issued addresses stating that the tariff duties established by the last Congress were wholly inadequate to check the influx of British goods.

Since no money was being accumulated by manufacturers or farmers, it was difficult to obtain capital for public improvements from individuals at this time, and Congress was urged to furnish the money for a general system of internal improvements.

For seven years steamboats had been running on the Hudson and Delaware. Steam navigation on the Mississippi had been introduced in 1812 or 1813, so that it was possible to bring merchandise up from New Orleans, as well as to float goods down with the tide in arks and flat-boats. Sugar was being brought up during the war, from decay, it was the custom to put an empty tar barrel over the top of each. These barrels were called Madison's nightcaps, and when they were removed, they were eagerly seized upon by a crowd of men and boys, who cast them into the flames of a bonfire, around which they gathered and cheered.

1 It is interesting to note, in this connection, that of the 28,000,000 dollars subscribed to this bank by the outside public, two millions came from New York, four millions from Baltimore, and four millions from New England; while Philadelphia subscribed nine millions of dollars, three of which were taken by Stephen Girard, being equal to the total amount subscribed by all of the Southern and Western States.

2 In order to protect the masts of the vessels, laid
from New Orleans to Pittsburgh, whence it was transported by wagons over the mountains to the Atlantic cities.

Gallatin's plan for internal improvements was referred to by Madison in his message to Congress, which met in December, 1815. Two canals, with a total length of about one hundred miles, would, it was thought, enable a steamboat to go from Boston to the St. Mary's River, Georgia, by an inland route. The committee to whom the message was referred recommended a canal to join Lake Erie with the Hudson and with the Ohio, and also recommended the construction of a road over the mountains, to connect the headwaters of the Susquehanna with the Allegheny. Calhoun, who had formerly opposed all expenditures from the National Treasury for internal improvements, now gave his support to these measures by advocating the setting apart of the million and a half of dollars paid by the Bank of United States for its charter, and the dividends on the stock owned by the United States, as a fund for building canals and roads.

In a speech which has become famous he thus forcibly advocated the constitutionality of the expenditure of national funds for internal improvement:

What can add more to the wealth, strength, and political prosperity of our country than cheapness of intercourse? It gives to the interior the advantages of the seaboard. It makes the country price, whether in the sale of raw product or in the purchase of the article to be consumed, come near to the price of the commercial town, and it benefits the seaboard by enlarging the sphere of demand. Were the pecuniary gains of the farmer or the merchant the only consideration, it might well be doubted whether a system of good roads and canals should not be left to individual enterprise. But there are far higher motives. The strength and political prosperity of the republic are concerned in it. No country enjoying freedom ever occupied as great an extent of territory as that possessed by the United States. One hundred years ago the most profound philosopher did not suppose it possible that a pure republic could exist on even so small a scale as Great Britain. Yet what was then considered chimerical we have, and so happily are the powers of the States and the General Government blended, that much of our political prosperity is drawn from the very extent of our territory. Let it not, however, be forgotten—may, let it forever be kept in mind—that our vastness exposes us at the same time to the worst of all calamities—dissension. We are great, and rapidly, I was about to say fearfully, growing. This is our pride and our danger, our weakness and our strength. The strongest of all cements, it is true, is the wisdom, the justice, the moderation of this House. Yet good roads and canals will do much to unite us. Those who know the human heart know well how powerfully distance tends to break the sympathies of our nature. Nothing, not even differences of language, so estranges man from man. Let us then bind the republic together with roads and canals. Am I told that the Constitution does not give Congress the necessary power, and that we cannot expend public money save for the execution of enumerated powers? I answer, I am no advocate of refined arguments on the Constitution. That instrument was not intended as a thesis for the logician to exercise his ingenuity on. It ought to be construed in a good, plain sense, and what can be more explicit than the Constitution on this very point? Congress shall have the power, says the Constitution, to establish post offices and post-roads. It is true that this is usually said to mean the designation of the roads over which the mail shall be carried. But does not the word "establish" comprehend something more? Congress, again, has power to lay and collect taxes, duties, imposts and excise, and for what purpose? In order to pay the debts and provide for the common defense and general welfare of the country. It is commonly contended that the paragraph contains three distinct grants of power: laying taxes, providing for the common defense, and doing what is necessary for the general welfare. This is a wrong interpretation, and, as roads and canals will contribute to the general welfare, Congress may lay taxes and duties to pay for them.

When the bill came up for final decision, it was passed by a vote of eighty-six to eighty-four in the House and by twenty-six to sixteen in the Senate, but in the last hours of his term of office, March, 1817, President Madison returned the bill with a veto based upon constitutional grounds.

The action of Madison only delayed the march of internal improvement for a short time. As a result of the energetic action of the New York Legislature in appropriating funds, the ceremonies of removing the first sod for the Erie Canal were held at Rome, New York, on the 4th of July, four months...
after an attempt to pass the “Bonus Bill” over Madison’s veto had failed.

In a letter to Baron von Humboldt, dated Monticello, June 13, 1817, Thomas Jefferson thus writes concerning the Erie Canal and the introduction of the steamboat:

In our America we are turning to public improvements. Schools, roads, and canals are everywhere either in operation or in contemplation. The most gigantic undertaking yet proposed is that of New York for drawing the waters of Lake Erie into the Hudson. The distance is 353 miles, and the height to be mounted 661 feet. The expense will be great, but its effects incalculably powerful in favor of the Atlantic States. Internal navigation by steamboats is rapidly spreading through all our States, and that by sails and oars will ere long be looked back to as among the curiosities of antiquity. We count much, too, on its efficacy for harbor defense, and it will soon be tried for navigation by sea. We consider the employment of the contributions which our citizens can spare, after feeding, and clothing, and lodging themselves comfortably, as more useful, more moral, and even more splendid, than those preferred by Europe, of destroying human life, labor and happiness.

THE NATIONAL ROAD.

When the territory lying beyond the Ohio river belonging to Virginia was surrendered by that commonwealth in 1781 and 1784, it was stipulated that a road across the Allegheny mountains should be constructed. The ordinance of 1787, establishing the Northwest Territory, contained a clause confirming previous legislation concerning this road, and providing that two per cent of the proceeds of all the sales of land made by the Ohio Company should be devoted to the establishment of that highway. When Ohio, in 1802, was admitted to the Union, that State agreed to levy no tax on the land sold for five years, and that ten per cent of the purchase money should be appropriated to the construction of a National Road. It was not, however, until 1806 that a law was passed by Congress ordering a survey for the road from Cumberland as far as the eastern boundary of Ohio.

The committee of the Senate to whom this bill was referred reported December 19, 1805, that the State of Maryland had appropriated the funds for “making roads from Baltimore and from the western boundary of the District of Columbia and from Frederick Town to Williamsport . . . . but the State of Maryland has no particular interest to extend their road over the mountain—and if they had, it would be impracticable, because the State does not extend so far,” and that “they thought it expedient to recommend and allow it to make a road from Cumberland to the northerly bank of the Potomac and within the State of Maryland to the river Ohio, at the

most convenient place on the easterly bank of said river opposite to Steubenville.”

The same report contained the following statement:

The committee have examined as far as their limited time and the scanty sources of facts within their reach would permit, the various routes which have been contemplated for laying out roads pursuant to the provisions of the act first mentioned in this report.

They find that the distance from Philadelphia to Pittsburgh is 314 miles by the usual route, and on a straight line about 270.

From Philadelphia to the nearest point on the river Ohio, contiguous to the State of Ohio, which is probably between Steubenville and the mouth of Grave Creek, the distance by the usual route is 360 miles and by a straight line about 308.
From Baltimore to the river Ohio, between the same points and by the usual route, is 275 miles, and on a straight line 224.

From this city (Washington) to the same points on the river Ohio the distance is nearly the same as from Baltimore; probably the difference is not a plurality of miles.

From Richmond, in Virginia, to the nearest point on the river Ohio the distance by the usual route is 377 miles; but new roads are opening which will shorten the distance fifty or sixty miles. 247 miles of the contemplated road from Richmond northwesterly will be as good as the roads usually are in that country, but the remaining seventy or towns on the Potomac within the District of Columbia, and still less with Richmond, in Virginia.

At present the greatest portion of their trade is with Philadelphia; but it is believed their trade is rapidly increasing with Baltimore, owing to the difference of distance in favor of Baltimore and to the advantage of boating down the Monongahela river from the point where the road strikes it, about 70 miles by water and 50 by land, above Pittsburgh.

The committee further stated that they were fully convinced "that a wise government can never lose sight of an object so important as

MAIL PIGOT BILL
WAY BILL
FROM PHILADELPHIA TO WHEELING.

Name of Passengers    No.    W.    E.    D. C.    By whom received

Mr. DeLatre 1  Philadelphia 12 or 1/2

Mr. Longstreet 1  Philadelphia 12 or 1/2

Mr. Hickey 2  Philadelphia 3 2/3

Mr. Moundville 2  Bedford 7 2/3

Passenger Way Bill from Philadelphia to Wheeling, containing names of passengers and receipts for fare by agent. June 30th, 1837.

eighty miles are bad for the present, and probably will remain so for a length of time, as there seems to be no existing inducement for the State of Virginia to incur the expense of making that part of the road passable.

From Baltimore to the Monongahela river, where the route from Baltimore to the Ohio river will intersect it, the distance as usually traveled is 218 miles and on a straight line about 184. From this point, which is at or near Brownsville, boats can pass down with great facility to the State of Ohio during a number of months in every year.

The mercantile intercourse of the citizens of Ohio with those of the Atlantic States is chiefly in Philadelphia and Baltimore; not very extensive in the that of connecting a numerous and rapidly increasing population, spread upon a fertile and extensive territory, with the Atlantic States, now separated from them by mountains, which, by industry and an expense moderate in comparison with the advantages, can be rendered passable."

The Act of Congress, approved by President Jefferson on the 29th of March, 1806, contained the following clause:

Be it enacted by the Senate and House of Representatives of the United States of America in
Congress assembled, That the President of the United States be, and he is hereby authorized to appoint, by and with the advice and consent of the Senate, three discreet and disinterested citizens of the United States, to lay out a road from Cumberland, or a point on the northern bank of the river Potomac, in the State of Maryland, between Cumberland and the place where the main road leading from Gwynn's to Winchester, in Virginia, crosses the river, to the State of Ohio; whose duty it shall be, as soon as may be after their appointment, to repair to Cumberland aforesaid, and view the ground from the points on the river Potomac hereinafore designated, to the river Ohio; and to lay out in such direction as they shall judge under all circumstances the most proper, a road from thence to the river Ohio, to strike the same at the most convenient place, between a point on its eastern bank, opposite the northern boundary of Steubenville, in said State of Ohio, and the mouth of Grave Creek, which empties into said river a little below Wheeling, in Virginia.

By Section 5 of the above act it was provided:

That said Commissioners shall each receive four dollars per day while employed as aforesaid, in full for their compensation, including all expenses. And they are hereby authorized to employ one surveyor, two chainmen and one marker, for whose faithfulness and accuracy they, the said Commissioners, shall be responsible, to attend them in laying out said road, who shall receive in full satisfaction for their wages, including all expenses, the surveyor three dollars per day, and each chainman and the marker one dollar per day while they shall be employed in said business, of which fact a certificate signed by said Commissioners shall be deemed sufficient evidence.

A survey through a portion of Ohio was authorized in 1811, but the war of 1812 delayed the work to such an extent that at the close of 1818 only 60 miles had been completed beyond Cumberland, although several other sections of the road through the mountains had been partially constructed and were in condition to be driven upon. At that time it was President Monroe's belief, as stated in his report to Congress, that the road could be finished to Wheeling in two years more. There had been $493,000 expended upon the road between the years 1806 and 1818, when the President's message stated that $400,000 would be required in order to complete it to Wheeling. From Wheeling the survey was extended westward directly across the States of Ohio, Indiana and Illinois. This line passed through Zanesville, Columbus, Springfield, Indianapolis, Terre Haute to Alton, and was surveyed as far as Jefferson City, Missouri, in 1827, in which year the road was completed to Columbus; work was begun at Indianapolis three years later. The McAdam system of road-making lately introduced in Europe was adopted. The road was "macadamized" about forty feet wide, mostly with limestone, over a considerable portion of its length. The bridges were well built of stone, except across the wider streams, and some of them consisting of two and three arches were thirty feet wide between the parapets. On the finer bridges panels with appropriate inscriptions were inserted in the stonework. Milestones were erected along the whole length of the road; on some sections triangular iron pillars properly marked were put up.

Appropriations from the National Treasury for the construction of the National Road—at first generally called the Cumberland Road—were favored by Webster, Clay and Calhoun, and although Jefferson expressed doubts as to the constitutional rights of the Government to construct roads in general without the adoption of an amendment to the Constitution, he signed the original bill. After 1820, when the political parties were re-organized, President Monroe vetoed a bill, on constitutional grounds, which assumed jurisdiction over this important highway. John Quincy Adams, however, took the other view, since he believed that the power rested in the Government to establish internal improvements, and during his administration routes were surveyed and laid down and their construction hurried forward on an extensive scale.

Jackson, however, coincided with Monroe in his interpretation of the Constitution, and in May, 1830, vetoed a bill for the extension of the road to Washington City, and from its western terminus to the Gulf. Twenty-three
bills, appropriating over two and a half million dollars for the National Road, had been passed before Congress adjourned in 1830.

Although the act authorizing its construction was passed in 1806, it was not until August 1, 1818, that the first stage-coach bearing the United States mails passed over its full length from Cumberland to Wheeling.

The contract stipulated that the road-bed over the mountains should be 32 feet wide, 20 feet of which in the middle were covered with stone 18 inches deep, tapering to 12 inches at the edges. The right of way required for the improvement was 60 feet wide.

The bridges from one end of the road to the other were carefully constructed by competent workmen.

Until the construction of the Baltimore and Ohio Railroad, the National Road continued to be the favorite highway between points west of the Allegheny Mountains and Washington City. As stage-owners and mail-contractors desired to make a good impression on the Congressmen who travelled in their coaches, stage movements probably never gained a higher state of perfection in this country than on this route.

The phrase "chalking his hat," which developed into the free-pass system, is said to have originated on the National Road.

The Washington Critic about fifteen years ago contained the following:

[1] The upper six inches of the stone were broken to pass through a ring 3 inches in diameter, and the larger stone to pass through a 7-inch ring, the superstructure being carefully covered with good gravel thoroughly compacted by an iron-faced roller, four feet long, weighing three tons.

[2] A. S. Little, of Fayette County, Pennsylvania, thus describes the construction of this road: "I was there to see it located and the stakes stuck down the mountain across the old commons south of Woodstock, afterwards Monroe, . . . before a shovelful of earth was displaced, and also to see that great contractor, Mordecai Cochran, with his immortal Irish brigade, a thousand strong, with their carts, wheelbarrows, picks, shovels and blasting tools, grading those commons and climbing the mountain-side, . . . and leaving behind them a roadway good enough for an emperor to travel over."

The first man to introduce the hat-chalking business in this country was Mr. Reeside, father of Mr. J. E. Reeside, of Washington. Away back in the days of Old Hickory, the first-named gentleman, in connection with others, was the great star-route contractor of the Union. Mr. Reeside and his friends ran lines of stage coaches from this city to all the leading points in the West and Southwest. Mr. Reeside was agent of the Company for this city, and knew all the M. C.'s from the sections named. Occasionally he would take a liking to some Representative or Senator and would tender him a free ride to his home when Congress adjourned.

Now, the old man was mighty strict with his drivers and agents, holding them pecuniarily responsible for the face of everybody who got onto the coaches. To prevent his agents being imposed upon by forged passes, the old man devised a peculiar hieroglyphic. The M. C. would have his name printed on the inside of his hat, and Mr. R. would take a piece of chalk and write his hieroglyphic on the outside of the hat.

In a short time Mr. R.'s mark became known on all the lines, and a man with the mark on his tile could ride all over the West and Southwest gratis, because, as the drivers expressed it, "the old man's chalking his hat." Thus Mr. R. became the forerunner of all the chalk-daubing now in the United States. This is a fact, as the writer had it from the lips of Mr. J. E. Reeside, who has seen his father sling the chalk many a time in days long gone by.

The construction of this road was made a political issue for many years, and the heated debates in relation thereto, contained in the Journals of Congress, show how earnestly and eloquently America's distinguished statesmen advocated or opposed the extension of internal improvements at the expense of the General Government.

Through Congressional action, the portions of the National Road lying within the borders of Pennsylvania and Ohio were surrendered to those States in the year 1831, and Maryland and Virginia were authorized to assume control over the parts lying within their boundaries in the year 1833.

A half million dollars was appropriated in 1834 and $546,000 in 1835 to complete the unfinished portions of the road, when the above-named States should formally accept control over the parts lying within their boundaries. Between 1835 and 1838 about $625,000...
EARLY AMERICAN MACHINE SHOPS.

additional were appropriated for the road east of the western boundary of Ohio and an equal amount for the line through Indiana, and $566,000 for the portion located in Illinois.

Indiana's portion being unfinished in 1848 was surrendered to that State, with wood and stone enough obtained from the public lands to finish it. Owing to the difficulty of obtaining stone in Illinois, crude methods of construction were adopted, and the road-bed was never brought to the same state of perfection as in the East. When the work of construction was finally stopped in 1850, over six millions of dollars had been expended upon it.

The question of completing the National Road was earnestly discussed in the newspapers during 1830, the party in power being charged with delaying the work. In this year, the Baltimore and Ohio Railroad having completed a track from Baltimore as far west as Ellicott's Mills, travelers desiring to reach the West were conveyed by horse cars to the railroad terminus and thence by stage coaches to Cumberland. The extension of the railroad to Cumberland in 1842 and to Wheeling in 1853 sealed the fate of the National Road, and the steam locomotive and train took the place of the fleet stage coach, which for so many years had conveyed statesmen and citizens of high and low degree over this historic highway.

The construction of the National Road was an important factor in settling one of the most important constitutional questions which has arisen since the foundation of our government.

EARLY AMERICAN MACHINE SHOPS.

In a letter dated at Hoboken, N. J., June 3, 1895, Francis B. Stevens, the veteran civil and mechanical engineer, communicated the following facts to the author concerning the condition of the mechanic arts in America during the first decades of the century:

Machine shops, taken in the common acception of the words, did not exist in the United States before the beginning of the present century; although for fifty years previously "steam engine building had become a recognized trade in England," see "The Steam Engine," by John Farey, London, 1827, page 221. Farey also says that brass cylinders were in the Newcomen engine from 1712 to 1747 (pages 231, 272, 290); also that cast-iron cylinders were made and bored in England in the middle of the last century, page 291. The early colonists brought the carpenter and the smith with them, together with their simple tools, and, with these, saw-mills and grist-mills were erected. I remember to have seen, upwards of half a century ago, in a remote district, an old but effective saw-mill in which the only piece of iron or steel visible was the saw, the fastenings being made by treenails. Our mechanics soon became excellent workers in wood and expert ship-builders, but for many years the bulk of the hardware used was imported. Prior to the Revolution pig-iron was made and exported, and a few small forges were then in use, but there were few tools for working metals. The cast-iron cannon made during the Revolutionary War were cast hollow, and the bore was made smooth by grinding with sand and water.

It soon became the settled policy of the British Government to discourage manufacturing in its American colonies, and the prohibition of the manufacturing of iron was far more tyrannical than the Stamp Act or the excise on tea. The following is a clause from Act 23d George II.: "That from and after the 24th of June, 1750, no mill or other engine for slitting or rolling of iron, or any plating forge, to work with a tilt-hammer, or any furnace for making steel shall be erected, or, after such erection, continued in any of His Majesty's colonies of America."

By an act of Parliament, that was not repealed until 1820, it was forbidden for many years to export machinery from Great Britain excepting by special order of the King in Council. I believe that there were three known instances of the order for exportation having been given for steam engines—one for the water works at Chaillot near Paris in 1780; one for the Manhattan Water Works of the city of New York in the year 1800, and one to Fulton, then in England, for the exportation, in 1806, of the engine of the vessel that was afterwards built in this country by him and called the Clermont.

This order for the exportation was not obtained until some time after the completion of the engine, and not until the battle of Trafalgar had left England the mistress of the seas. This was the first engine capable of producing rotary motion that was exported from England; the two others mentioned were single stroke pumping engines, and the three engines were all made by Boulton and Watt, at Soho, near Birmingham.

In the year 1753, and probably previous to the
act of Parliament, a member of the famous Hornblower family of engineers brought to this country and erected a Newcomen pumping engine at a copper mine near Belleville, N. J., on the Passaic river, and four miles above the city of Newark. In the year 1838, my uncle, the late Robert L. Stevens, directed me to go to the mouth of the copper mine and measure a cast-iron pump about 18 inches in diameter and lined with brass, that was offered to him. I found the machinery that had been erected there eighty-five years previously scattered around the mouth of the shaft. I measured the pump and examined the machinery, which was of a very primitive type, and as the mouth of the shaft was open, by throwing stones down I estimated, by the time taken by them to reach the water, that the shaft was about five or six hundred feet deep. Without question, this was the first steam engine erected on this part of the continent. It antedated the patent of Watt by sixteen years and the introduction of his engine into use by twenty-one years. Mr. Stevens bought the pump, and it was used from 1838 to 1856 for supplying the locomotive tenders of the Camden and Amboy Railroad with water drawn from a large well a little over five-eighths of a mile from the end of the wharf at South Amboy. This engine at Belleville was the single-acting atmospheric engine of Newcomen.

In the year 1793 the Newcomen atmospheric engine was in use in England, Scotland and Wales, and it was the only description of steam engine in existence actually doing work during the sixty-two years intervening between its invention and introduction in 1712, and the introduction of Watt's engine in 1774.

The workmen brought over by Hornblower remained here and established a machine shop at Belleville. This was the first machine shop in the country, and it was here that the experimental steamboat of Chancellor Livingston, Mr. Nicholas Roosevelt and Col. Stevens was built in 1798.

John Fitch and James Rumsey made their experiments simultaneously between the years 1785 and 1798. Fitch's engines propelled his boat by perpendicular oars or paddles "resembling snow shovels," and having an alternating motion, his boat being of ten or fifteen tons burthen. She plied on the Delaware between Philadelphia and Burlington from June 14th to September 10th, 1790, having been advertised in two Philadelphia newspapers twenty-three times, and having made thirty-one passages, going once up the river to Lambertville and once down to Chester. (See Thompson Wescott's excellent life of Fitch.) Rumsey was much less successful. His engine worked a pump that took in water through a pipe at the bow and forced it out at the stern, and thus created a propelling force. Many before him advocated this ineffective method, and it has been frequently revived. The engines of both Fitch and Rumsey were built by blacksmiths, coppersmiths and plumbers. Fitch had the work done at Philadelphia, and Rumsey at Baltimore and Fredericktown, Md., where he attempted to have his cylinders cast at the works of Governor Brown, but the attempt was unsuccessful and they were made of copper.

In regard to Fitch's engine, Benjamin Franklin Bache, the grandson of Dr. Franklin, in his newspaper, the Franklin Gazette, January 17th, 1791, after having made many trips, says: "A boat on this construction, barring all accidents of breaking paddles, cranks, gudgeons, watch wheels, chains, loggerheads, cocks, valves, pins, bolts, pistons, cylinders, boilers, condensers, air-pumps, and God knows how many more useful parts which we have omitted, would almost stem the tide of the Delaware." And he also says that "the engine could be kept in tolerable order at a very moderate expense, as one master blacksmith with three or four journeymen, a master blacksmith with as many journeymen, aided by an ingenious watch and clockmaker, provided they are industrious, will be amply sufficient for the purpose." The plans of propulsion of Fitch and Rumsey were both radically wrong in principle, and steam navigation could not have been introduced by them, even if the machine shops of the present day had been accessible.

When the city of Philadelphia built water works on the site of the present municipal building in Philadelphia at Broad Market Street in the year 1800, and ten years after Fitch had made his steamboat, the cylinder of the pumping engine, thirty-eight and a half inches diameter, was bored at the Belleville shops mentioned above, and the letter from Thomas P. Cope to the city authorities, dated July 3d, 1800, and published in the Scientific American, No. 45, November, 1876, states that they had been at work "day and night" boring the cylinder for eight weeks, and that he expected "that six weeks more would be required to finish it." This letter shows how inefficient the tools were, yet at that date this must have been the best machine shop in the country, and the letter, taken in connection with the statements regarding the engines of Fitch and Rumsey, shows how unprepared we were at the commencement of this century to make a steamboat engine. The extension of Watt's patent expired in the year 1800, and the machine shop of Boulton & Watt was the only one then in existence that could make a reliable steam engine capable of giving rotary motion to a shaft.

In the year 1801, the men sent over by Watt to erect the Manhattan pumping engine in New York
followed the example of those sent by Hornblower, and established a machine shop called the Manhattan Works, near the Manhattan pumping engine, and on the north side of Duane Street, extending to its intersection with Centre Street. This shop was afterwards known as M'Owen's, later as Cunningings', and also as the Columbian Foundry. The latter name it retained until the first of the month of May last, and the building stands now unoccupied. The Hoboken Shops were built by Col. Stevens in 1804. His rotary engine of 1802 was probably built at the Manhattan Works. The propeller engine exhibited at Chicago was certainly built there in 1804.

Mr. John Nuncarrow, an Englishman, is said to have established a machine shop in Philadelphia at an early date, and Oliver Evans established one there in 1804, which at his death was continued by his son.

The machine shop of I. P. Morris & Co. was among the earliest ones. Fulton embarked at Fal- mouth, Eng., October 25, 1806, and arrived in New York in December. The Clermont made her first passage to Albany August 11, 1807. After the success of the Clermont, Fulton built a machine shop at Paulus Hook, then a village of less than 100 inhabitants, now Jersey City, and there, during seven years, until his death in 1815, he made the engines for the boats that he then successfully built, and by which he firmly established steam navigation. These engines were strict copies of the engines he imported, with the exception that the cross head was substituted for the bell crank, and that the boilers were different. When twelve or thirteen years old I frequently saw his steamboats Firefly, Lady Richmond and Olive Branch.

The introduction of steam navigation led immediately to the construction of machine shops and of good steam engines, and tools and appliances for manufacturing and mill work.

Among the earliest machine shops was the West Point foundry at Cold Spring, opposite West Point on the Hudson river. It was established during the war of 1812 for casting cannon, and had in connection a machine shop at the foot of Beach Street, New York. These works at West Point are still in operation. Later came the works of James P. Allair, of Berbeck, of James, of Cunningham, and others, and then the Novelty Works founded by Dr. Nott and Thomas B. Stillman, the Morgan Works, the Delamater Works, the Archimedes Works of H. R. Dunham & Co., the Fletcher and Harrison Works, and others. All these machine shops made machinery of various kinds, but chiefly engines for steamboats and for service on land on the Atlantic seaboard. The former were almost universally condensing engines, and the latter almost universally non-condensing, on account of the difficulty of getting water for condensation, and also on account of the greater simplicity of their construction.

The general introduction of railroads, locomotives and the telegraph in the decade between 1840 and 1850 gave an extraordinary impulse to the creation of machine shops, greater than the invention of the Bessemer process leading to the substitution of steel for wrought iron, and greater than the impulse given by the recent inventions of the various applications of electricity.

In 1810 William J. Duane, Chairman of the Committee on Roads and Internal Navigation in the Pennsylvania Legislature, wrote: "Virginia is rivalling New York in improvements of canals, locks, etc., in the neighborhood of her capital and collieries, and I am told that railroads will also be very soon introduced there."

The introduction of a railroad in Pennsylvania appears to have been thought of as early as 1811, when the Union Canal Company was authorized by the Legislature "to introduce any different mode or device, or any improvement hitherto adopted, or such as may hereafter anywhere be invented in the system of internal navigation."

As early as 1811, the Legislature of Pennsylvania appropriated $825,000 for building bridges and opening roads. Although the State expended over $200,000 on account of the war of 1812, appropriations for public works were continued during that period. Between 1812 and 1816 $809,000 were appropriated for the construction of roads through the State and for the improvements of rivers and creeks, and in 1817 $525,000 were appropriated for similar objects. Five hundred thousand dollars had been subscribed for ten bridges and 1,050 miles of turnpike within her borders. The bridges that had been built over the Schuylkill at Philadelphia, and over the Delaware at Trenton, and over the Susquehanna by her citizens, were the finest in the world.

1 Letters to People of Pennsylvania respecting Internal Improvements, by William J. Duane, Philadelphia. Printed by Jane Aitkin, 1811.
At that time the bridge engineers of the United States led the world in the boldness of their designs, and "Pennsylvania led the United States."

A joint commission, with representatives from Maryland, had been appointed, in 1817, to examine the Susquehanna in order to improve the river from Harrisburg to Tioga Point. They urged the appropriation of $20,000 for that object, and declared that in order to connect Market Street Bridge with Columbia River and the Pacific Ocean it was only necessary to build seventy-five miles of canal. Their plan was to clear the Schuylkill to its upper branch, and connect that river with the Susquehanna at Berwick by a canal twenty-three miles long, to remove obstructions in the North Branch of the Susquehanna to Tioga Point, improve the Tioga river to Elmira, and construct a canal thence to Seneca Lake, and to secure boat connection thence to Lake Ontario from Canandaigua to Great Sodus Bay. From Berkeley it was proposed to improve the Western Branch of the Susquehanna to the headwaters of Sinnemahoning Creek, at a point twenty-three miles from the Allegheny, and by building a canal across this strip of country, to secure communication with the headwaters of the Ohio, and thence down the Allegheney to Pittsburgh, between which point and New Orleans thirty steamboats were already in operation.

Although "no city was so favorably situated as Philadelphia for commanding the whole inland trade of the whole continent," New York and Baltimore were not idle in their efforts to obtain this western traffic. The National Road from Baltimore to Cumberland was completed and the portion between the latter point and Wheeling was nearly finished. A canal from Chesapeake Bay to the Delaware was also being discussed, and in every State the spirit of internal improvement was active. The new Congress was appealed to for aid, but Monroe in his very first message declared his belief that since Congress had no right to use public money for internal improvements, the Constitution should be amended to give this power. A large portion of the session of 1817 and 1818 was taken up in the discussion of various bills relating to the construction of roads and canals at Government expense, all of which were defeated in the House of Representatives save one, which declared the right of the Government to build military roads in time of war.

In the meantime the Erie Canal was being constructed, and New York was reaching out with more energy than ever to secure the trade of the West. A firm owning a Hudson river steamboat packet line was advertising to move freight from New York via Albany to Pittsburgh for $64 per hundredweight, and New York shippers were establishing themselves along the rivers that entered Lake Erie from Ohio, and even on the highways of the Allegheny. A whole year had elapsed since Madison by veto declared that the expenditure of national funds for the construction of roads and canals was unconstitutional, but strange as it may appear, at this particular period the members of the Pennsylvania Legislature seem to have been overcome by a singular condition of apathy from which it was found impossible to rouse them. The Pittsburgh Transportation Company was, it is true, chartered by the Legislature in 1817 with a capital of $35,000, and sixty waggons, one leaving each terminus daily, were placed upon the road, from twelve to fourteen days being consumed in the trip each way; but the establishment of this line of independent shippers had no influence whatever upon the Western carrying trade from New York, at which city a line of swift packets for Liverpool were arriving and departing every four weeks. Pittsburgh was then a most prosperous city, for upon one day alone in June, 1818, seven thousand emigrants, with goods amounting in value to over three millions of dollars, were in that city waiting for the waters of the Ohio to rise so that they might be conveyed down the stream.

Three thousand men were at work on the

1 The first stage with mail ran from Cumberland to Wheeling, August, 1818.
During this and the following years the necessity for internal improvements in Pennsylvania was actively discussed in the public prints and at Harrisburg. 1

The Harrisburg Telegraph, in comparing the freight charges in 1817 and 1836, says:

In 1817 it is stated that in the course of twelve months 12,000 wagons passed the Allegheny mountains from Philadelphia and Baltimore, each with from four to six horses, carrying from 35 to 40 hundredweight. The cost for carriage was about $7 per hundredweight, and in some cases as high as $10 to Philadelphia. The aggregate sum paid for the conveyance of goods exceeded $1,500,000. To move a ton of freight between Pittsburgh and Philadelphia therefore cost no less than $140, and took probably no less than two weeks' time. In 1836 the average amount received by the Pennsylvania Railroad for the carriage of freight was 3/4 of 1 per cent. a ton per mile. The distance from Philadelphia to Pittsburgh is 285 miles, so that the ton which cost $140 in 1817 was carried in 1836 for $2.27. At the former time the workingman in Philadelphia had to pay $14 for moving a barrel of flour from Pittsburgh against 28 cents now.

The Pittsburgh consumer paid $7 freight upon every 100 pounds of dry goods brought from Philadelphia, which 100 pounds is now hauled, in two days at a cost of 14 cents.

In the spring of 1819 the dullness of manufactures caused a feeling of general discontent to pass over the manufacturing States. Public meetings were held and resolutions adopted demanding remedy for these evils which had been brought about by the extensive importation of English goods. In August, 1819, the Pennsylvania Society for the Encouragement of American Manufactures was founded, and issued a manifesto, demanding that Congress should revise the tariff laws in order that

1 Even as late as 1830 it would have cost more both in time and money to ship a ton of merchandise from Philadelphia to Cincinnati by any direct overland route from Philadelphia to Pittsburgh and thence down the Ohio River, 650 miles in all, than by this circuitous route: (1) Philadelphia by steamboat to Bordentown, (2) overland to South Amboy, (3) by steamboat to New York City and up the Cleveland, (5) thence through the Ohio State Canal to Portsmouth on the Ohio River, (7) thence via that river to Cincinnati, a total distance of 1,100 miles, than to have made the shipment.

1 Formally opened for business, October, 1825.

2 Steamboats had been plying regularly on the Delaware since 1800, and the short overland haul of about 30 miles through the level State of New Jersey, between Bordentown and South Amboy, or between Trenton and New Brunswick en route to New York, was attracting Western traffic in that direction.
"the drooping manufactures might be revived and that protection to American industries should be immediately offered." Patriotic societies, similar to those formed in 1803, whose members pledged themselves to wear nothing but American clothing made of American fabric, were again formed in the seaboard States from Maryland eastward. To join such a society was regarded a patriotic duty, which was embraced by hundreds of citizens, who hoped in this way to reduce the demand for English manufactured goods. When Congress met in December a crisis had arrived. Bankruptcies were numerous both among merchants and manufacturers; the farmers and laborers were idle and the factories were shut. The Senate committee who were directed to report on the causes and remedy for this general condition of distress, recommended that money be voted at all these troubles came the failure of the Bank of the United States and the general panic which resulted therefrom.

An interesting phase in the early history of transportation in the United States was the hesitancy of State legislatures, except in Pennsylvania, to provide for internal improvements by taxation, and the early aggregation or concentration of private capital for the construction of public works.

The beginning of the corporate establishment of transportation companies in the United States forms a most important chapter in the history of American jurisprudence. The granting of exclusive privileges, or monopolies, was a serious problem that confronted the law-makers in every part of the country.

During the early decades of the century, by far the greater number of larger corporations chartered by the different States were organized for the construction of bridges, turnpikes, steamboats and canals, for which the capital could not have been secured save by granting exclusive privileges to these companies at least for a term of years. The legislative enactments upon our statute-books were based almost entirely upon the laws of Great Britain, which had long stood the test in that old nation where the whole country was governed by a single parliament.

On this side of the Atlantic, in a new country with immense territory, a score of State Legislatures, in addition to the General Government, were engaged in discussing the problems of State rights, interstate commerce and the control of the inland navigable waters of the United States, together with what has proven to be a most serious question in America and elsewhere—Government ownership or control of transportation lines and the telegraph. Many of the charters granted to the early companies contained a provision which gave to the State the right to purchase the works at the expiration of a stated period of time, under certain prescribed conditions, relating to the method to be pursued to obtain an equitable valuation of the works.

None of the State constitutions adopted prior to 1800 by the sixteen States then comprising the Union contained any provision for the establishment of corporations save for educational purposes. It is in the constitution...
of Ohio, adopted November 29, 1802, that we first find a general provision for the establishment of corporations.¹

The State of Alabama is entitled to the credit of first adopting a constitutional provision, August 2, 1819, requiring that "The General Assembly shall make provision by law for obtaining correct knowledge of the several objects proper for improvement in relation to navigable waters and to the roads in this State, and for making a systematic and economical application of the means appropriate to these objects."

The constitution of Missouri, which was the next State admitted to the Union (1820), provides that "internal improvement shall forever be encouraged by the Government of this State; and it shall be the duty of the General Assembly, as soon as may be, to make provision by law for ascertaining the most proper objects of improvement in relation both to roads and navigable waters; and it shall also be their duty to provide by law for a systematic and economical application of the funds appropriated to these objects." This constitution also declared for a "concurrent jurisdiction on the river Mississippi," and promises that "the navigable rivers and waters leading into the same, whether bordering on or within this State, shall be common highways and forever free to the citizens of this State or of the United States." It also enacts by special ordinance relating to the sale of State lands, "that 5 per cent of the net proceeds of the sale of lands . . . shall be the said rivers, and all improvements that have been made or shall be made thereon"; and of Tennessee, which states (Art. XI., Sec. 29) "that an equal participation of the free navigation of the Mississippi is one of the inherent rights of the citizens of this State; it cannot, therefore, be conceded to any prince, potentate, power, person or persons whatever."

¹The constitutions of Indiana, adopted June 29, 1816 (Art. X., Sec. 1), Mississippi, adopted August 13, 1817 (Art. VI., Sec. 9), Illinois, adopted August 26, 1818 (Art. VIII., Sec. 21), contain provisions in regard to the establishment of corporations for conducting the banking business.

reserved for making public roads and canals," three-fifths within the State and "two-fifths in defraying under the direction of Congress the expenses to be incurred on making of a road or roads, canal or canals leading to the said State."

The constitution of New York, adopted November 10, 1821, provides that—

Rates of toll not less than agreed to by the Canal Commissioners, March 12, 1821, shall be imposed on and collected from all parts of the navigable communication between the great Western and Northern lakes and the Atlantic Ocean, which now or hereafter shall be made and completed; and the said tolls, together with the duties on the manufacture of all salt, as established by act of April 15, 1817 . . . and the amount of revenue established by act of Legislature, March 30, 1820, in lieu of the tax upon steamboat passengers, shall be and remain inviolably appropriated and applied to the completion of such navigable communications, and to the payment of the interest and re-imbursement of the capital of the money already borrowed, to make and complete the same. And neither the rates of toll . . . nor the duties on salt . . . nor the amount of the revenue . . . in lieu of the tax upon steamboat passengers shall be reduced or diverted at any time before the full and complete payment of the principal and interest of the money borrowed or to be borrowed as aforesaid.

The financial status of some of the great turnpike companies of Pennsylvania in 1819 and 1820 is shown by the reports for those years to the Auditor-General of the State, published in the Appendix.

The actual expenditures by the State of Pennsylvania for internal improvements during the year ended November 30, 1821, aggregated $577,259.29, as follows:

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Turnpikes</td>
<td>$450,914.53</td>
</tr>
<tr>
<td>Rivers</td>
<td>34,861.89</td>
</tr>
<tr>
<td>Creeks</td>
<td>4,380.00</td>
</tr>
<tr>
<td>Bridges</td>
<td>51,335.00</td>
</tr>
<tr>
<td>Canals</td>
<td>5,000.00</td>
</tr>
<tr>
<td>State Roads</td>
<td>50,798.57</td>
</tr>
</tbody>
</table>

The growth of steam navigation had been much more rapid in America than in England. It was perhaps as late as 1810 that the business of steamboat building was fully organized in this country. In 1820, at the end of
the first decade there were in the United States:

<table>
<thead>
<tr>
<th>Steamboats</th>
<th>Tonnage</th>
</tr>
</thead>
<tbody>
<tr>
<td>52</td>
<td>10,500</td>
</tr>
<tr>
<td>71</td>
<td>14,200</td>
</tr>
<tr>
<td>4</td>
<td>1,440</td>
</tr>
<tr>
<td>5</td>
<td>1,950</td>
</tr>
</tbody>
</table>

132 with a total tonnage of nearly 28,000 tons, showing that an average of over one boat of 200 tons had been turned out each month.

During this decade many miles of canals were also under contract or projected.

ORIGIN OF THE FIRST PENNSYLVANIA RAILROAD COMPANY.

The failure to construct the “New Jersey Railroad,” as the road from Trenton to New Brunswick was designated in the first American charter, did not deter John Stevens from making further efforts to construct railways elsewhere in America.

That Mr. Stevens fully recognized the importance of connecting the Delaware river with the Chesapeake and the Susquehanna is shown by the following extract from his memorial to the New Jersey Legislature in 1815, while the first charter was pending:

There are within the limits of the United States a great number of places where these railways may be introduced to immense advantage. I shall at present particularize only two.

The distance across from the Delaware to the head of the navigation on the Bohemia river emptying into the Chesapeake, is not more than twelve miles over a level country. As the expense, therefore, would be comparatively trifling, I need not expatiate on the magnitude of the object of establishing railway communication between the waters of the Delaware and Chesapeake.

But another line of communication, by means of railways, of still greater importance, might next be undertaken. I mean from Philadelphia to the Susquehanna river near Harrisburg. However profitable this would undoubtedly be, it would by no means prove a very arduous undertaking, as, although the intervening country is hilly, it is not mountainous.

In 1818 he issued a pamphlet† entitled “Hints on the Expediency of a Railroad from Philadelphia to Pittsburgh, most respectfully addressed to the consideration of the Members of the Legislature of Pennsylvania,” from which the following extracts are quoted:

It is evidently the policy of Philadelphia and, of course, of the State, to complete a railroad from Philadelphia to Pittsburgh with all possible expedition. The efforts now making by the neighboring States to engross the commerce of the interior are well known to every member of the Legislature. To counteract the obvious tendency of these efforts to deprive Philadelphia of the internal trade she now enjoys requires the immediate adoption of decisive and energetic measures.

The turnpike now in progress towards completion from Baltimore and from Washington to the Ohio river will give to these cities a decided superiority over Philadelphia, even were a turnpike equally as good completed from the latter to Pittsburgh. For it ought not to be concealed or forgotten that the difference in distance between Philadelphia and Pittsburgh, and Baltimore and the Ohio at Wheeling, is greatly in favor of the latter.

Mr. Breck, in his very able and instructive “Sketch of Internal Improvements,” &c., informs us “that Baltimore is nearer to the Ohio by 90 miles over the new National Road, toll free.” This circumstance, however, would not be so decisively advantageous to Baltimore as might at first blush be apprehended.

The expense of transportation on railroads, by the use of steam in propelling carriages, would be reduced to such a trifle as scarcely to enter, as an item, into any calculation respecting the preference to be given to either of these commercial depots, even were a railroad to Baltimore to be substituted for the turnpike. The superior local advantages enjoyed by Philadelphia would much more than compensate this small addition to the expense of transportation. It would not, indeed, independent of toll, amount to more than 20 cents on a ton weight.

The Allegheny mountains present an insuperable obstruction in the way against the practicability of effecting a direct communication between the Atlantic and Western States by means of canals. Mr. Gallatin, in his able report to Congress, has satis—

† An original copy of this pamphlet formed a part of the exhibit of the Pennsylvania Railroad Company at the Chicago Exposition, being lent for the purpose by Mrs. Edwin A. Stevens of Castle Point, Hoboken, N. J. Mrs. Stevens is the relict of the seventh son of John Stevens.
HINTS,

On the expediency of a RAIL ROAD from Philadelphia to Pittsburg.

Most respectfully addressed to the consideration of the members of the Legislature of Pennsylvania.

It is evidently the policy of Philadelphia, and of course, of the State, to complete a rail-road from Philadelphia to Pittsburgh, with all possible expedition. The efforts now making by the neighboring States to engross the commerce of the interior, is well known to every Member of the Legislature. — To counteract the obvious tendency of these efforts to deprive Philadelphia of the internal trade she now enjoys, requires the immediate adoption of decisive and energetic measures.

The turnpikes now in rapid progress towards completion, from Baltimore and from Washington to the Ohio river, will give to these cities a decided superiority over Philadelphia, even were a turnpike, equally as good, completed from the latter to Pittsburg. For it ought not to be concealed or forgotten, that the difference in distance between Philadelphia and Pittsburgh, and Baltimore and the Ohio at Wheeling, is greatly in favor of the latter. Mr. Breeck in his very able and instructive "Sketch of internal improvements," &c. informs us "that Baltimore is nearer to the Ohio by 90 miles, over the new national road, toll free." This circumstance, however, would not be so decisively advantageous to Baltimore, as might, at first blush, be apprehended. The expense of transportation on rail-roads, by the use of steam in propelling carriages, would be reduced to such a trifle, as scarcely to enter, as an item.
FURTHER HINTS,

On the expediency of a rail road from Philadelph to Pittsburg.

Most respectfully addressed to the consideration of the Members of the Legislature of Pennsylvania.

The discussion of the question on what is called the bank bill, was calculated to arouse the sectional feelings of the house. Whilst the intercourse between the east and the west remains in the situation it is at present, this want of cordiality will be increased between the interior and Philadelphia, the commercial capital. It is the unavoidable consequence arising from the want of a cheap and easy communication. It is admitted that the transportation of foreign goods into the interior, is not, can be done by means of turnpike roads. The superior value of the articles will bear the heavy expense of this mode of conveyance. But it is well known that perhaps no article of the products of the country can be transported on the best turnpike road, with profit, beyond one hundred miles. As Pittsburg is more than three hundred miles from Philadelphia, the carriage of produce from thence to Philadelphia on a turnpike road, is quite out of the question. How then are remittances to be made in payment of the foreign goods purchased by the western leader at Philadelphia? He has but one way of effecting this at present. Produce can, to be sure, be taken down the Ohio to a
factory shown "the impracticability, in the present state of science, of effecting a canal navigation across the mountains."

He then adds: "The works necessary to facilitate the communication from the seaports across the mountains to the western waters must, therefore, consist of artificial roads." Accordingly, we find for effecting this all-important purpose turnpike roads have been resorted to as a substitute for canals. But surely it is needless to point out how miserably inadequate a succedaneum they present. It is notorious that no bulky, heavy article can bear the expense of transportation, even for a comparatively short distance, in this mode of conveyance.

Railroads, however, will be found to be more than a mere substitute for canals. They are in their very nature capable of being conducted over ground, where, from various circumstances, it would be altogether impracticable to carry canals.

In the choice of ground for carrying over a railroad we are in a great measure left at liberty. We can at pleasure ascend or descend, whereas the course of a canal must necessarily be limited to its range.

There must at all times be a sufficient supply of water, and this water can only be conducted on a level or downhill. In the one case the hills must be either perforated or leveled, whereas in the other they may be passed over, if not in a direct, at least in a diagonal course.

Merchandise can be transported from Philadelphia to Pittsburgh on a railroad without being shifted from one vehicle to another, whereas, from New York to Pittsburgh by way of the canal, it would be necessary to shift the articles at least four or five times, and to transport them more than one thousand miles.

There was a railroad between the waters of the Ohio and Susquehanna and those of the Delaware to be carried into effect upon the best possible construction, it would soon become the greatest thoroughfare in the known world.

But who does not see the superior commercial advantages Philadelphia would derive from the easy and cheap communication with the Western world afforded by a road—a road leading at once into the heart of a country uncommonly fertile and unbounded in extent—whereas this favored land would be approachable through the great canal by a most circuitous and inconvenient route.

To enable this commonwealth to contend successfully against the combined efforts of her neighboring rivals, to frustrate the mischievous tendency of these efforts, it is essentially necessary that all her energies should be concentrated.

When the very existence of her internal commerce is at stake, let not her funds be wasted away upon minor objects.

In 1819 Mr. Stevens published and distributed another pamphlet "Addressed to the Consideration of the Members of the Legislature of Pennsylvania," entitled, "Further Hints on the Expediency of a Railroad from Philadelphia to Pittsburgh." From the original copy, reprinted in full in the Appendix, the following extracts objecting to the construction of a canal are quoted:

In the fond hope and expectation of the ultimate success of this arduous enterprise [canal], in grasping at a shadow the substance would be lost. Long before the accomplishment of such a work the commerce of Philadelphia with the interior would be diverted into other channels and lost irrecoverably.

But there remains one course to be pursued by which she may yet not only retrieve the ground she has already lost, but gain forever a complete ascendency over all her rivals. When I earnestly urge their immediate attention towards constructing a railroad of more than three hundred miles in length, let me not be accused of a temerity bordering on insanity.

Another important advantage of a railroad over a canal is, that lateral roads may, without the least difficulty, branch off in all directions, and the loaded carriages from these branches can be admitted to enter on the main railroad without the necessity of unloading, whereas, in case of a canal, it would be necessary to shift the load from the carriage to the boat.

Mr. Stevens urged that an appropriation of $10,000 should be made to build an experimental mile of track, and continues:

When the very existence of the capital as a commercial depot is at stake; when the future prosperity of the interior must depend altogether on the facility of transporting its products to a market, can there possibly be any hesitation with the Legislature to afford the means of investigation on an object promising results of such vast magnitude?

Let it not be concluded that a railroad from Philadelphia to Pittsburgh would effect only a partial benefit.

Should the experiments succeed (which no doubt they will), this important species of road can, and unquestionably will, be extended in all directions. Diverging from the center, like the rays of a sun, railroads will diffuse light, heat and animation to every extremity of the commonwealth.

To determine then by experiment the practicability of the proposed railroad would require a very short period of time, and after the route had been
Mr. Breck from the committee to whom was referred on the 11th inst. a petition from John Stevens, on the subject of rail ways, made report, which was read as follows, to wit:

That these rail way roads are scarcely yet known in America, but that in England they have long been, and now are, successfully used, particularly upon inclined planes, in the neighborhood of coal mines. They consist of a tract constructed of iron, stone, timber, or other material, upon a level surface or inclined plane, or other situation, for the purpose of diminishing friction, and thus serving for the easy conveyance of heavy loads of any kind of articles.

They have been multiplied in various parts of Great Britain, in short sections of one and two to five miles, and serve greatly to cheapen the transportation of lime, coal and other bulky articles from the quarries, kilns and mines, to the canals, which intersect that country in almost every direction, and have been very useful both in regard to its agricultural improvements and its manufacturing interests.

Some of these roads are formed by means of iron rails laid along them, upon which the materials are carried in waggons of from six to thirty hundred weight, and on a railway well constructed, and laid with a declivity of 55 feet in a mile, one horse will readily take down waggons containing from 12 to 15 tons, and bring back the same waggons with 4 tons in them.

It is even stated by English writers that a horse of the value of 90 pounds, or about 90 dollars, drew down the declivity of an iron road 3-16 of an inch at a yard, 21 waggons with coal and timber, weighing 35 tons; the same horse drew up the declivity 5 tons with ease.

Mr. Stevens has calculated the cost of a mile of rail way in America as follows:

<table>
<thead>
<tr>
<th>Item</th>
<th>Cost</th>
</tr>
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<tbody>
<tr>
<td>Bar iron plates</td>
<td>$7,603</td>
</tr>
<tr>
<td>Brick pillars</td>
<td>$1,600</td>
</tr>
<tr>
<td>Timber ways</td>
<td>$1,600</td>
</tr>
<tr>
<td>Reduction of elevations</td>
<td>$500</td>
</tr>
</tbody>
</table>

The gentleman has gone into minute explanations of his views, upon this novel and interesting subject, as may be seen by the accompanying diagram and papers; and by a reference to them it will be seen likewise that in 3 or 4 instances rail-way roads...
have been profitably extended to a distance of 28 miles; and may be adopted in this country for the transportation of bulky articles from river to river, over ground that has not more than one degree of elevation, or 90 feet in a mile.

Prone as the people of America are to introduce into their country all useful improvements, we must soon expect to see experiments made here upon these rail ways. It would perhaps have been desirable to have had even now a trial made upon a small scale, under the immediate authority of the government of Pennsylvania; but the lateness of the session forbids any such expectation; and the committee therefore beg leave to recommend the memorial of Mr. Stevens, together with the subject generally, to the early attention of the next legislature.

Ordered, To lie on the table.

The bill from the House of Representatives, entitled
"An act repealing the acts, entitled, an act declaring Anderson's creek in Clearfield county, and part of Le Bœuf creek in the county of Erie, public highways," was read the third time, and

Resolved, That it pass.

The bill from the House of Representatives, entitled
"An act providing for the vacation of parts of certain state roads," was read third time, and

Resolved, That it pass.

The bill from the House of Representatives, entitled
"An act to authorise the Governor to incorporate a company for making an artificial road from the borough of Northampton, in the county of Lehigh, to the borough of Wilkesbarre, in the county of Luzerne," was read the third time, and

Resolved, That it pass.

Ordered, That the clerk return said bills to the House of Representatives, with information that Senate have passed the same, the former without, and the two latter with amendments, in which the concurrence of that house is requested.

On motion of Mr. Welles and Mr. Power,
The Senate resumed the second reading and consideration of the bill from the House of Representatives, entitled
"An act to prevent the fishing with seines in Penn's creek in Centre county, and to encrease the penalty for fishing in the river Susquehanna on days prohibited by law," postponed for the present yesterday.

The question on section 1. recurring,
It was determined in the affirmative.
Sections 2. and 3. were severally considered and agreed to.
Section 4. Having been considered,

On the question,
Will Senate agree to said section?
The yeas and nays were required by Mr. Grosh and Mr. Davidson, and are as follow, to wit.
THE PENNSYLVANIA RAILROAD COMPANY.

Mr. Stevens wrote to John Jay on June 23, 1819, hoping to enlist his interest in proving the practicability of the proposed railroad. In the letter he said:

A short time before the termination of the late war, at my solicitation an act passed the Legislature of New Jersey incorporating a company for forming a railroad between Trenton and New Brunswick. Had the war continued there is no doubt this act would have been carried into immediate effect, but since this period nothing has been done. I am now desirous of opening a subscription for this purpose, but am apprehensive the novelty of the undertaking may deter individuals from risking their property on an untried project. To afford, therefore, an ocular demonstration of the feasibility of the plan, I wish to form a railroad similar to the one intended, extending from a short distance near the ferry-house and hotel at Hoboken. On this railroad will be placed a carriage to be propelled by means of steam, to which will be attached one or more pleasure carriages. The pleasantness and novelty of this mode of conveyance will, of course, attract company from New York; and would, I presume, soon more than indemnify me for the expense incurred in its erection.

But however flattering the prospect of emolument may be, it is by no means the object I have in view. Such an experiment would at once inspire confidence in the practicability of the projected railroads above mentioned, and do away with all difficulties in obtaining subscriptions. To give you some idea of the vast extent of the field my project ultimately embraces, I take the liberty of enclosing some "Hints on the expediency of a railroad from Philadelphia to Pittsburgh," also documents.

From these details you will perceive what importance I attach to the business of bringing railroads into general use throughout the United States. And I flatter myself that you cannot fail to be impressed with similar sentiments. All that is wanting to make such an impression general is merely to exhibit to public view an exact specimen of the contemplated improvement in actual operation.

Mr. Jay replied to Mr. Stevens on July 13, 1819, expressing a hope that the experiment would be successful, but did not feel it in his power to give it any financial aid.

The advantages and disadvantages of a railroad continued to be discussed in the State press of Pennsylvania, especially in the Philadelphia journals.

Under date of January 5th, 10th and 15th, 1821, John Stevens wrote to Robert Wharton, Mayor of Philadelphia, urging prompt action in the construction of a railroad to Pittsburgh. In his letter of the 10th, Mr. Stevens said:

I now take the liberty of enclosing two printed addresses to the Legislature of your State on the subject of a railroad from Philadelphia to Pittsburgh. These documents will furnish some idea of the nature and advantages of the proposed plan. Should it not be convenient to form, at the present time, a railroad on any part of Market Street, it may temporarily be placed on any suitable spot contiguous to the city, and should it extend to merely a quarter of a mile in length it will be fully adequate to the purpose of furnishing a correct...
estimate of the expense per mile, and also of its
comparative advantages over a turnpike road.
Should the corporation of your city conceive the
object in view at any time they may please to appoint, in
order to explain more fully the nature and advan-
tages of the proposed plan . . .

And on the 15th Mr. Stevens wrote:

On the fifth inst. I did myself the honor of ad-
dressing you a letter respecting the formation of a
railroad from Philadelphia to Pittsburgh, accom-
panied with two printed papers on the subject,
addressed to the Legislature of your State. I also
took the liberty of proposing to the corporation to
institute an experiment on a small scale, which, as
the railroad for the whole distance would be exe-
cuted precisely in the same manner, would furnish
a very satisfactory opportunity of testing its com-
parative superiority in every respect over all other
modes of transportation. The expense of such an
experiment need not exceed two or three thousand
dollars, depending on the length to which it may
be carried.

The project of constructing a railroad from
Philadelphia westward through the efforts of
John Stevens by private correspondence, by
published pamphlets and by public letters in
the newspapers, had thus been brought to the
attention of State and City officials and the
citizens of Pennsylvania. The importance of
the question of internal communication was
earnestly discussed in the months that fol-
lowed, and arrangements were made to bring
the matter up for formal legislative action
soon after the meeting of the General Assem-
by in December, 1822.

In a memorial to the General Assembly in
1822, Mr. Stevens said:

That whereas the erection of a railroad from Phil-
adelphia to Columbia would greatly facilitate the
transportation to and from these places; and whereas
your memorialist has invented a mode of construct-
ing railroads which, in his estimation, is superior
to those now in use, therefore your memorialist
respectfully prays that the Legislature would be
pleased to pass an act of incorporation constituting
your memorialist and his associates a body politic
and corporate, with full powers for the purpose of
erecting a railroad between Philadelphia and Co-
lumbia, and extending the same to Harrisburg.

A bill was read in the Pennsylvania Senate,
January 16, 1823, "to incorporate a company
to erect a railroad from Harrisburg to Pitts-
burgh," but failed to pass the House. The preamble read:

Whereas it has been represented by John Stevens,
in his memorial to this Legislature, that a railroad
from Harrisburg to Pittsburgh would greatly fa-
cilitate the transport between those places, suggest-
ing also that he hath made important improvements
in the construction of railways, and praying that in
order to carry such beneficial purposes into effect,
himself and his associates may be incorporated.

Finally, Mr. Stevens' efforts to found a
company were rewarded, when, on March 31,
1823, the Governor of Pennsylvania approved
the act to incorporate a company to construct
a railroad from Philadelphia to Columbia, in
Lancaster County. The preamble read:

Whereas it hath been represented by John Stevens,
in his memorial to the Legislature, that a railroad
from Philadelphia to Columbia would greatly fa-
cilitate the transportation between those two places, suggest-
ing also that he hath made important improvements
in the construction of railways, and praying that, in order to carry such beneficial purposes into effect,
himself and associates may be incorporated.

It was ordered that John Connelly, Michael
Baker, of Arch Street; Horace Binney,
Stephen Girard, Samuel Humphreys, of Phila-
delphia; Emory Bradley, of Chester County;
Amos Ellmaker, of Lancaster City, and John
Barbour and William Wright, of Columbia,
should be constituted "The President, Di-
rectors and Company of the PENNSYLV-
ANIA RAILROAD COMPANY." 1

1 For a record of the events which followed the
granting of this charter the reader is referred to the
chapter entitled "The Philadelphia and Columbia
Railroad."