The Erie Canal: How American Patriots Had To Battle for Infrastructure

by Judy Hodgkiss

The following words are engraved on a capstone for the Buffalo locks system at the Lake Erie end of the Hudson River to Lake Erie Canal, which demonstrate how the canal's builders situated its importance for improving the general welfare of the United States, and for forging the way for any country, not dominated by an oligarchic system, to do likewise:

> ERIE CANAL. Let posterity be excited to perpetuate our free institutions and to make still greater efforts than our ancestors, to promote public prosperity, by the recollection that these works of internal improvement were achieved by the *spirit and perseverance of REPUBLICAN FREE MEN* [all emphasis in original].

And the following are the last two lines of Samuel Woodworth's poem read at the 1825 opening ceremonies:

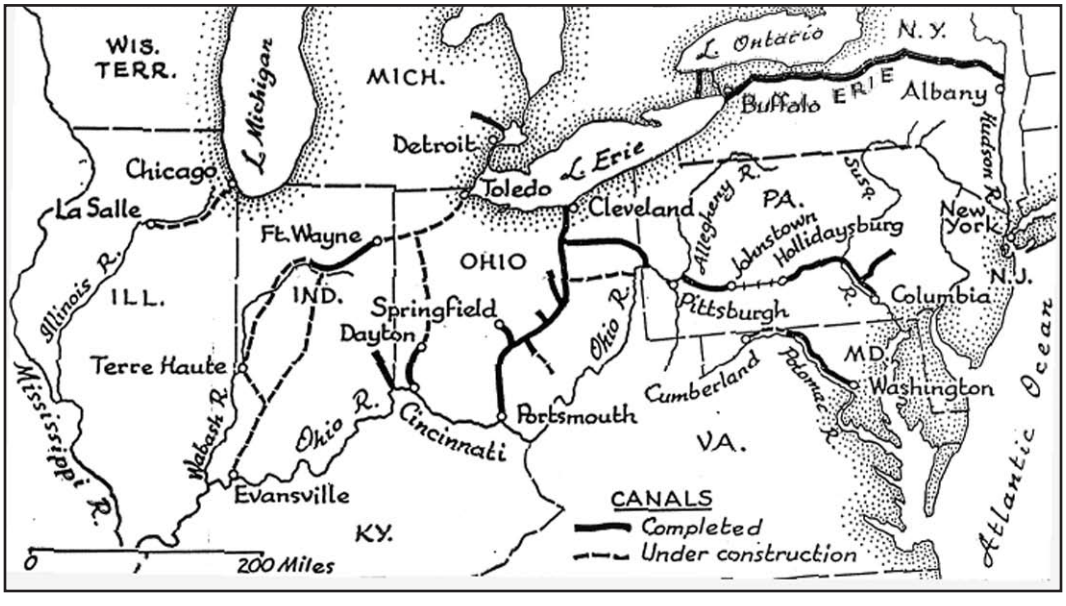
> It is, that the vassals of Europe may see
> The progress of mind, in a land that is free.

Under the Presidencies of Thomas Jefferson and James Madison, the nationalist policies of Washington and Hamilton were abandoned, the Bank of the United States was closed, and the young nation's commitment to development and expansion began to falter. The British imperial forces had regrouped, with the aim of destroying our fledgling country's economic capabilities from within, and of embroiling us in wars abroad.

As America was increasingly isolated and threatened, as a result of the degeneration of the (British-controlled) French Revolution, and the resultant rise of the evil Napoleonic regime, a sense of pessimism and gloom had begun to sweep the nation.

That this tide of pessimism was turned, was largely due to the fight which took place in the state of New York around the question of the Erie Canal: Here, instead of pessimism, the idea of America's "Manifest Destiny" began to take concrete form. It was only after the spectacular success of the canal project, that the U.S. Congress and the other states demanded similar projects for the rest of the nation.

Today, one might think that the building of the Erie Canal should have been obvious; actually, the undertaking was as challenging as the idea of putting a man on the Moon was in the 1960s. For example, President Jefferson, in 1810, when approached by a delegation of New York legislators asking



Canals in the 1840s. The Erie Canal linked New York and the eastern seabord to Ohio and other western states, without going through British-controlled territory. Subsequently, canal networks were built in Ohio, connecting Lake Erie to the Ohio River, providing the basis for industrializing what was then the western part of the United States, and connecting the eastern seaboard to the Mississippi River.

for Federal funding for the canal, was overwhelmed by the enormity of the project:

> It is a splendid project … and may be executed a century hence. Here [at the Potomac] is a canal of a few miles, projected by General Washington which has languished for many years because the small sum of $200,000 … [could not] be obtained. And you talk of making a canal three hundred and fifty miles long through a wilderness! It is little short of madness to think about it.

But where the British imperial footprint was most evident, was where we find the young Martin Van Buren, heir to the New York political machine of the British-controlled traitor, Aaron Burr, cutting his political teeth in the fight to kill the canal project, which he labelled the "Ditch of Iniquity."

Fortunately, our American optimism and commitment to the pursuit of happiness prevailed.

In 1819, long before the United States had even one mile of railroad track in any part of the country, the Governor of New York, DeWitt Clinton, a man who would dedicate a decade of his life to the idea of the "Grand Canal," urged the population of New York to stand fast for the faltering project, on behalf of the future "stock of human happiness":

> The greater part of the United States … form one vast island, susceptible of circumnavigation to the extent of many thousands of miles [i.e., the Atlantic Ocean, to the Gulf of Mexico, up the Mississippi River, to the Great Lakes]. The most distant parts of the confederacy will then [with the canal] be in a state of approximation, and the distinctions of eastern and western, of southern and northern interests, will be entirely prostrated. To be instrumental in producing so much good, by increasing the stock of human happiness—and by extending the empire of improvement, of knowledge, of refinement and of religion, is an ambition worthy of a free people.

West Point Inspires the Erie Canal

Both DeWitt Clinton's father, Brig. Gen. James Clinton, and his uncle, Revolutionary War Governor of New York, George Clinton, had been collaborators of George Washington and Washington's aide-de-camp, Lt. Col. Alexander Hamilton, in the effort to establish the fort at West Point as the major strategic fortification of the American Revolution. Even though West Point would not be formally established as an Academy until 1802, and its civilian engineering program not established until 1825, Revolutionary-War West Point, as America's premier fortification, served as an *ad hoc* war-time engineering school. Involved in its programs were a group of French military engineers, led by Gen. Louis Duportail, Washington's Chief of Engineers, who had travelled in Washington's entourage, and who had been trained in the engineering program of the famous Marshal Vauban. And, at the head of the West Point engineering team, on site, was the Polish engineer and patriot, Thaddeus Kosciuszko.

Before the war, in 1775, James Clinton and Christopher Tappen had conducted a survey for the construction of a permanent fort at West Point. Clinton, a colonel in New York's colonial militia at the time, had previously been appointed surveyor on behalf of the colony, by Lt. Gov. Cadwallader Colden. Colden, in turn, had earlier served as surveyor for the Colony, and had, in 1724, been the first American to map out a potential route for a canal system that might connect the Hudson River to the Great Lakes.

Cadwallader Colden, a scientist, medical doctor, and public health authority, had been a key collaborator of Benjamin Franklin;[1] he had engaged, along with Franklin and the German scientist and mathematician Abraham Kästner, in a battle over epistemology against the Leibniz-hating Leonhard Euler.[2]

On Nov. 7, 1777, during the Revolutionary War, Gen. James Clinton, Gov. George Clinton, and Gen. Israel Putnam sent a joint proposal to George Washington (then at Valley Forge), concerning the proposal for the fortification of the Hudson River and the blocking of its navigation at its choke point, at a cliff overhang called West Point.

Putnam wrote to Washington: "All of these circumstances considered, we [he and the two Clintons] have concluded to obstruct the navigation at [West Point], and shall go about it immediately."

Unfortunately, Putnam then proceeded, in an act of insubordination, to leave the area, in order to build up his forces further south on the Hudson. Alexander Hamilton met with the two Clintons, and then wrote back to Washington: "I fear, unless you interpose, the works here will go on so feebly for want of men that they will not be completed in time … Governor Clinton will do everything in his power. I wish General Putnam was recalled from the command of this post, and Governor Clinton would accept it."

Washington then wrote to Governor Clinton: "Nothing would be more pleasing to me, and I am convinced more advancive [sic] of the interest of the States, than for you to take the chief direction and superintendance of this business."

By July 1778, when Washington visited West Point for the first time, it had been functioning for a few months, not only as the nation's largest fortification, but also as an engineering school under the direction of its Chief Superintendent of Engineering, the Polish engineer who had been recruited by Benjamin Franklin in Europe, Thaddeus Kosciuszko. Gen. James Clinton and Kosciuszko gave Washington a tour of the

1. Phil Valenti, "The Leibniz Revolution in America." *EIR*, Aug. 13, 2004.
2. David Shavin, "Leibniz to Franklin on Happiness." *Fidelio*, Spring 2003.

grounds. By July of 1779, another of Franklin's European recuits, Baron von Steuben, who had been at Valley Forge, would arrive at West Point, as officer in charge of training.

At that point, the son of General Clinton, DeWitt Clinton, would have been ten years old.

The Grand Canal

In 1772, Benjamin Franklin had completed a study of Britain's canals, and sent the report back to his friends in Pennsylvania. One of them, Samuel Rhoads, a Quaker businessman in Philadelphia, responded enthusiastically, and Franklin wrote to him on Aug. 22, 1772:

> I am glad my Canal Papers were agreeable to you. If any Work of that kind is set on foot in America, I think it would be saving Money to engage by a handsome Salary an Engineer from hence who has been accustomed to such Business. The many Canals on foot here under different great Masters, are daily raising a number of Pupils in the Art, some of whom may want Employ hereafter; and a single Mistake thro' Inexperience, in such important Works, may cost much more than the Expence of Salary to an ingenious young Man already well acquainted with both Principles and Practice. This the Irish have learnt at a dear Rate in the first Attempt of their great Canal, and now are endeavouring to get Smeaton to come and rectify their Errors.

The Smeaton to whom Franklin refers, was his close friend and collaborator at the London Royal Society, John Smeaton. It would be no coincidence that, again, a chief proponent of canal building, in association with Franklin, would also be involved in a battle at the Royal Society, promoting Leibniz's notions of power and force, as against the incompetent Newton.[3]

After the Revolution, and before he was called upon to be President, General Washington, who had retired from the Army and Congress, turned his attention to the idea of a canal system that would connect the Potomac River with Ohio. He motivated his plans with the following remarks: "The western settlers … stand as it were upon a pivot. The touch of a feather would turn them any way … smooth the road, and make easy the way for them, and then see what an influx of articles will be poured upon us; how amazingly our exports will be increased by them, and how amply we shall be compensated for any trouble and expense we may encounter to effect it."

The monumental Erie Canal project, called a "Sheer Folly" by its detractors, paid for itself in ten years, and fostered rapid industrial growth, making New York the "Empire State," giving the North an industrial economy more powerful than the slave-based economy of the South. Here, the biggest engineering challenge to the project, scaling the more that 60-foot Niagara Escarpment in Locksport.

In 1785, Washington met with Elkanah Watson, just returning from Europe. Watson had been a courier to Europe during the War, moving between Philadelphia and Ben Franklin in Paris; after the War, he stayed on in Europe to study the long history of canal systems of France, Holland, and elsewhere in Europe, going back to the groundbreaking work of Leonardo da Vinci in the 15th Century. Prior to da Vinci, the medieval locks had consisted of huge plank constructions that rose or fell dangerously in gigantic guillotine-like frames. Da Vinci's elegant solution, designed for the Duke of Milan in 1485, was extremely successful. Da Vinci built locks that were double-gated and mitered: the two gates of the lock came together to form a V, pointing upstream; as the pressure of the water pushes against that V, the mitered gates simply press more firmly against each other, preventing any water from coming into the chamber behind.

In 1642, French engineers used 41 of Leonardo's double-gated mitered locks in the Canal de Briare, connecting the Seine and Loire rivers. The French then followed through in 1681 with the grand Canal du Midi (canal across the "middle" of France), built by Jean-Baptiste Colbert for Louis XIV.

Upon arriving in Virginia, Watson found Washington frustrated in his efforts in the mid-Atlantic states; Watson next traveled to New York, to begin a survey of the possible Hudson to Lake Erie canal route. In 1789, Washington joined Watson in an expedition to survey the territory.

In 1791, Watson published his survey findings in a pamphlet, in hopes of obtaining Federal funding for the project. The pamphlet was a collaborative effort with several prominent New Yorkers: Gen. Philip Schuyler, recently elected U.S. Senator; Simeon De Witt, New York's Surveyor-General; and Gov. George Clinton.

Schuyler (whose daughter had married Alexander Hamilton) and Watson would soon create the Western Inland Lock Navigation Company, to begin building a few miles of the Erie Canal as a private enterprise. Schuyler later pushed for the state to take over the vast project, and his company built locks on various canal projects in upstate New York, some of

3. *Philosophical Transactions of the Royal Society*, Vol. 66, December, 1776, p. 450.

which would function in conjunction with the state-built canal.

Simeon De Witt, DeWitt Clinton's cousin, had been the head of Washington's Geographical Department during the War, and was known as the Cartographer of the American Revolution. He went on to become a founder of the Albany Institute, America's foremost scientific institution in the early 1800s, and he also became the mentor of a young Joseph Henry, the inventor of the electrical telegraph and discoverer of electrical induction.[4] De Witt and Henry collaborated in studies of geomagnetism at the Albany Institute, as the Erie Canal was being built nearby.

By 1810, with no prospects of Federal help, the New York legislature alone passed an act to fund an official survey to determine the route for the canal. They established a Board of Canal Commissioners: Stephen van Rensselaer, Simeon De Witt, Thomas Eddy, Peter B. Porter, William North, Gouverneur Morris, and DeWitt Clinton (at the time, serving as both a state senator, and as mayor of New York City).

In 1811, a Canal Bill, pledging state-backed credit amounting to $5 million, passed the New York state legislature, in spite of opposition led by the Martin Van Buren "Bucktails" faction. Van Buren labeled the canal, the "Ditch of Iniquity."

The War of 1812 with Britain put everything on hold. The war hit New York state particularly hard, and when the legislature convened in 1814, the Van Buren Bucktails used the devastated post-war budget to convince the legislature to reverse itself on the canal.

DeWitt Clinton proceeded to organize "canal mass meetings" throughout the state, and in 1816, was victorious over the Van Buren machine in the race for Governor. The legislature then passed a bill funding only another survey for the canal. But it was a beginning.

In 1817, the legislature passed the entire canal bill again. Clinton said (presaging John F.Kennedy's "man on the Moon in ten years" speech): "The day will come in less than ten years when we will see Erie water flowing into the Hudson."

Cooper and Lafayette Join the Celebration

Judge Benjamin Wright was immediately appointed Chief Engineer for the Canal Project. He had no engineering background, only surveying, along with a love for "pure" mathematics (along with his friend, Simeon De Witt). The six associate canal "engineers" who were appointed, also had no professional training in engineering; but, by the time the project was completed, the group was known as the "Erie School of Engineering." They started out as surveyors, but finished the project as the nation's foremost hydraulic engineers. (West Point Academy had no input into civilian engineering at that time.)

The job, in 1817, looked formidable: The canal would be 363 miles long, with a descent from Lake Erie of 555 feet—although not a direct descent, but a complicated up and down, gulley and mountain roller-coaster descent. Hence, the need for 83 locks of the regular kind; and, in addition, at Lockport, near Buffalo, a new kind of lock had to be built to mount the 75-foot-high limestone face which forms the Niagara Escarpment. A double series of five interconnected locks was needed to surmount the escarpment, and allow the canal to connect to Lake Erie.

Also, 18 aqueducts were to be constructed, to literally lift the canal over various intersecting river systems, the largest being an unprecedented 750-foot aqueduct to carry the canal over the Genessee River.

The state legislature provided for a division of labor between the private contractors, and the directly hired state workers: the individual connecting segments of the canal were to be the responsibility of private contractors, with state-sponsored credit; the government took direct responsibility for the difficult jobs of constructing the locks and the aqueducts.

The most difficult dilemma of all, though, for the surveyor/engineers, was one with which no European engineer had to deal: where to find a source of pumice stone for hydraulic cement for the locks. What was plentiful in Europe, was not to be found at all in the eastern United States; the canal team, therefore, had to choose between the use of wood, which is highly perishable, or face the exorbitant price for imported cement.

The associate engineer, Canvass White, who had just returned from a tour of Britain's canal system, decided to tour the northern states to make a final effort to discover a U.S. mineral substitute for the cement. At the point of total discouragement, White was finally contacted by a construction contractor back in New York, in Chittenango, who claimed to have discovered the substance White was looking for: a peculiar kind of limestone, which, in a powdered form, does not "slack," or become diluted in water, but, on the contrary, becomes more solid.

Later, the painter Noble Whitford visited the shop of the Chittenango contractor, and produced a fanciful painting that depicts White's delight at seeing the material demonstrated.

In spite of the enthusiasm, the canal got off to a slow start. In addition to the engineering and technical difficulties, 1,000 laborers working in the marshes near Syracuse were stricken by a variety of diseases—malaria, ague, typhoid fever—and many died. Clinton had to ask the legislature for $1 million each year, over the following three years.

In 1822, Clinton lost his bid for re-election, despite the mobilization of support for his campaign by such notables as James Fenimore Cooper, who was the Secretary of the Clinton Republicans for Westchester County. Cooper had joined the New York state militia after serving as an officer in the U.S. Navy; he soon became the military aide-de-camp to Clinton. Also campaigning for Clinton was Cadwallader David Colden, the grandson of Ben Franklin's close friend in the colonial period. Cadwallader D. Colden had succeeded Clinton as Mayor of New York City, and, after the canal was finished,

4. Judy Hodgkiss, "The Story of Joseph Henry," *New Federalist*, Feb. 14, 2000.

Colden was commissioned by the city to write the story of the canal's construction, in a pamphlet for mass distribution.

By 1823, mainly because of Yankee ingenuity in the field, the pace of construction began to pick up. The Rochester-to-Albany segment was completed first, and the cost of freight on that line dropped from $100 to $5/ton, compared to overland hauling.

Two inventions in the field were hurrying completion: 1) a "stump puller," an ingenious device that enabled a half dozen men and a team of horses to remove 30-40 stumps a day; and 2) an "endless screw" device, the "sprig of Shillelah," made up of a cable attached to the top of a tree as tall as 60 feet, which winds up the tree so tightly, that one man can single-handedly bend it over and break it to a stump.

The Irish "paddys" working on the canal composed a ballad:

> I learned for to be very handy;
> To use both the shovel and spade;
> I learned the whole art of canalling:
> I think it an excellent trade.
> I learned for to be very handy,
> Although I was not very tall,
> I could handle the "sprig of Shillelah,"
> With the best man on the canal.

But the technical difficulties with the locks and aqueducts were adding to the costs, and the canal was the object of extreme controversy among New York taxpayers.

In 1824, the legislature, now controlled by Van Buren's Bucktails, voted Clinton out of the Canal Commission itself. Van Buren was out of town at the time of the vote, and, on his return, accused his party of going too far, saying: "There's such a thing as killing a man too dead."

In the face of this setback, Clinton proceded to rally the population, formed a new party, "The People's Party," and, on the eve of the completion of the canal, was voted back in as Governor.

On June 6, 1825, General Lafayette, on tour in the United States, visited the site of the near-completed spectacular Buffalo locks. The workers saluted him with the biggest powder blast into the limestone that they could muster.

Finally, on Oct. 26, 1825, the canal was completed.

Thousands readied themselves along the route of the canal for the celebrations accompanying the first vessels to travel the route to New York harbor, where President John Quincy Adams, Lafayette, and four former Presidents—John Adams, Jefferson, Madison, and Monroe—were waiting.

The historian, Carl Carmer, in "The Hudson," describes the jubilation:

> The "Seneca Chief," elegant packet, moved from Lake Erie into the new canal, "Hellespont of the West," at ten o'clock on Wednesday morning, October 26, 1825. At once a battery five hundred miles long began to fire. The gunners of Rochester heard a booming in the west and pulled their lanyards. The Syracuse cannoneers sent the sound echoing over the hills to Utica. The valley of the Mohawk gave it channel toward Albany. Spurts of white smoke crowned the high promontories of the Hudson, and the Catskills resounded with sharp explosions. Man-made thunder shattered against the columned walls of the Palisades. The first message ever carried on sound waves from Buffalo to New York had arrived in eighty-one minutes. The answer was back in Buffalo eighty minutes later. The whole state knew that by a new channel Erie water was running to the sea.
>
> "Who comes there?" shouted the captain of the "Young Lion of the West," waiting beside the stone aqueduct at Rochester.
>
> "Your brothers from the West on the waters of the Great Lakes."
>
> "By what means have they been diverted so far from their natural course?"
>
> "Through the channel of the great Erie Canal."
>
> "By whose authority and by whom was a work of such magnitude accomplished?" called the catechizer.
>
> "By the authority and by the enterprise of the people of the State of New York."
>
> With that the whole valley of the Genesee shook with the cheering of crowds and the salute of guns and the explosion of fireworks.

Col. William L. Stone delivered an address to the celebration in New York City: "[The builders of the Erie Canal] have built the longest canal, in the least time, with the least experience, for the least money, and to the greater public benefit."

In addition to the economic impact of the corridors of development opened up along its route, the canal directly paid back to the state, in tolls alone, $495,000 in 1825, and more than $1 million/year afterwards.

An English tourist at the time, Francis Kimball, commented: "The Erie Canal rubbed Aladdin's lamp. America awoke, catching for the first time the wondrous vision of its own dimensions and powers."

A Philadelphia journal wrote, jealously:

> New York has celebrated the completion of the Erie Canal with excess pomp and ceremony remindful of the days of ancient Rome. Obviously the success or failure of the Erie will greatly affect the future of Pennsylvania's proposed system of canals. We shall await the outcome with interest and, hopefully, be guided accordingly.

And then, not only Pennsylvania, but the entire country *was* guided accordingly.