

# Cadwallader Colden

## Father of the American Canal System



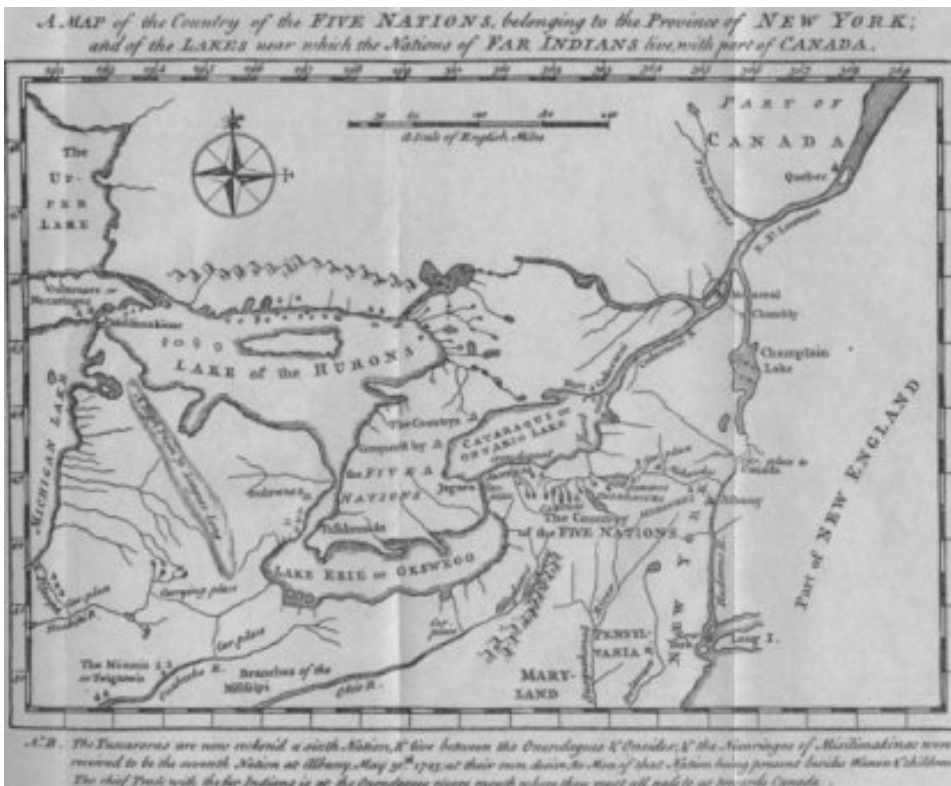
Cadwallader Colden, pictured at the top of this 1825 Erie Canal Celebration engraving, is considered to be the Father of the Canal System in America. The Erie Canal transformed our country into an industrial giant and substantially increased the quality of life for all Americans.

This essay relates the contributions of Cadwallader Colden toward the design and construction concepts of the Erie Canal. Also addressed are the economic benefits of the canal that Colden identified which were eventually realized by the construction of the canal, almost 100 years after Colden's initial proposal. Colden's canal effort earned him well-deserved and profound praise throughout America.

Also covered in this essay is America's first canal, built in the Town of Montgomery, NY by Cadwallader Colden to transport freight in horse drawn boats to his home from the Great Swale. Living with his family and virtually alone in the wilderness at the time, the construction of this early canal is a marvelous technical achievement that deserves recognition.

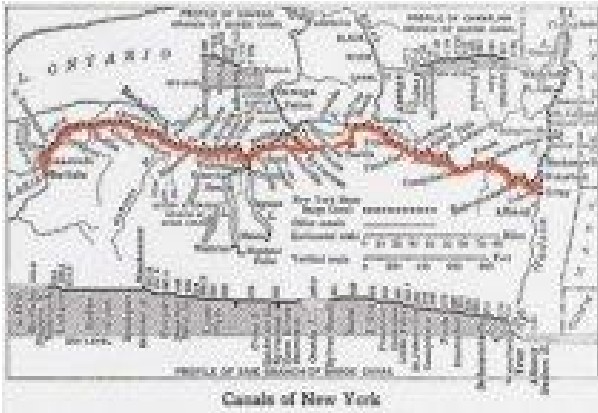
## A Brief Introduction to Cadwallader Colden

Cadwallader Colden (1688-1776) was a genuine colonial scholar and principal political leader of the New York Province. He was born in Ireland, of Scottish parents. After studying medicine in London, Colden arrived in Philadelphia to practice medicine in the Year 1710. He moved to New York in 1718, where he was appointed Surveyor General two years later. He was named to the Governor's Council in 1721 and he became increasingly influential during the administration of George Clinton, the Colonial Governor. In 1761 he became Lieutenant Governor of New York. Cadwallader Colden was also one of the most learned men in the colonies. He wrote his own critique of Newton, *The Principles of Action in Matter* in 1751 at a time when he was frequently providing significant technical advice and counsel to Benjamin Franklin concerning the latter's own scientific theories. He became a world-renowned botanist of the new Linnaean system of classifying flora and he exchanged flora data with distinguished botanists worldwide. Colden's daughter, Jane, became America's first lady scientist through her own proficiency in the field of botany. Colden made significant contributions to philosophy, science and medical literature. Colden walked the streets of New York City, treating the victims of the great disease in 1741-42 and he correctly identified sanitation as the primary cause of the disease. In his remarkable medical article "The Fever Which Prevailed in the City in 1741-42, Colden reviews in detail the dangers that might come from water, drainage, soil and impure air, and emphasizes the necessity for better ventilation among the poor, and improvement of the water supply, and above all, the necessity for some public system for drainage. Fortunately, his official position added weight to his recognition as one of the most distinguished scientists in the country, and the authorities of the time took his suggestions and proceeded toward the establishment of a plan of public drainage, which proved to be very significant toward the future health of the city. Colden's later writings about the Throat Distemper, which prevailed in New England in 1735 and later years, were considered some of the most important medical contributions of the time. The distemper was most likely diphtheria. Colden's attention was also drawn to Yellow Fever and he wrote extensively about that subject as well. Colden's communication became a sort of clearinghouse for all of the scientific ideas in America at the time and for being an outlet and inlet for European scientific interests.



Colden published his *History of the Five Indian Nations* in 1727 (updated in 1747), which is a valuable resource on the Iroquois tribes and their democratic form of government. This was likely the first history book published in America, by William Bradford, and it was widely read both here and in Europe where news about the colonies was cherished. Colden was adopted by the Mohawk Nation and he was able to freely travel throughout the Iroquois territory due to the great admiration that these Native Americans had for him.

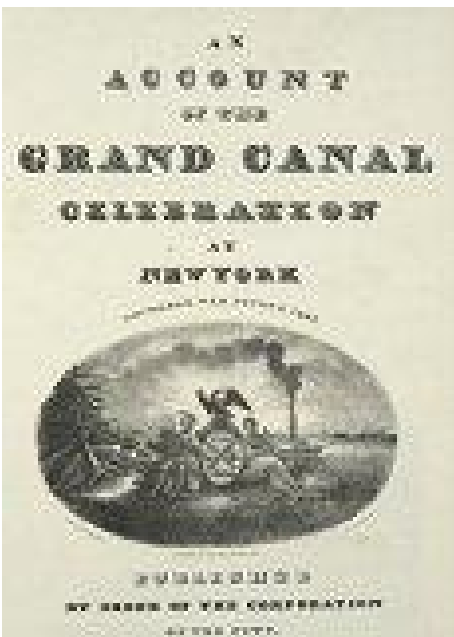
Acting as Surveyor General, Cadwallader Colden had reason to travel throughout New York and he spent a considerable amount of time in the lands of the Five (later six) Nations of the Iroquois. He became quite familiar with the existing topography, roadways, rivers and streams in this area and he also was familiar with the settlements of British and Dutch colonialists, Canadian French and the Native American castles (camps).



This map on the prior page shows northern New York and the land of the Five Nations of the Iroquois. That map accompanied the 1747 edition of the original 1727 Colden 'History of the Five Nations' book. The map to the left shows where Cadwallader Colden suggested, in 1724, that a canal be built to connect the Hudson River with the Great Lakes to enable increased trade with Native Americans (for fur) and western settlers for agriculture products and other trade opportunities in the west. Colden presented his vision for a canal to Colonial Governor Burnett on November 6, 1724.

Colden was the first to see the advantages of the topography of the land and the advantages of using natural New York streams and rivers as a means of commerce, in comparison to the French route up the St Lawrence River, which represented awkward travel during the winter months. Colden said about the French route that "The French Never attempt above one voyage in a year to Europe or to the West Indies, tho' it be really nearer Europe than any of the English colonies. Colden's proposal was the first suggestion regarding the course of the interior route canal, almost exactly along which the Erie Canal was finally built over 100 years later as indicated by the image above.

## On the cover – The Erie Canal Celebration



The fabulous 1825 Erie Canal Celebration engraving on the essay cover actually bears the images of two persons named Cadwallader Colden. Our Cadwallader Colden is at the top and his grandson Cadwallader David Colden is at the lower right to recognize his own considerable achievement toward enhancing American commerce through the building of the Erie Canal. Cadwallader David Colden (grandson) was a successful lawyer, former NY State Senator and former Mayor of New York City. He was also a friend, financier and biographer of Robert Fulton, of steamboat fame. Together, Robert Fulton and grandson Cadwallader David Colden spent much of their lives in pursuit of the building and designing of canals, inspired by the efforts of the senior Cadwallader many years earlier. Fulton, an accomplished civil engineer, provided George Washington, during and after his presidency, with incredibly detailed designs and cost estimates for the proposed New York canal. The grandson Cadwallader David Colden's contributions toward construction of the Erie Canal were also considerable and they rendered him a spot on the 1825 engraving, which featured his grandfather at the top, justifying the senior Cadwallader Colden as being the "Father of the American

Canal System", a title that is long overdue. The grandson Cadwallader David Colden also prepared the 'Memoir' for the 1825 Erie Canal Celebration. In the memoir, the grandson Colden reviewed the report of his grandfather, 100 years earlier, using some interesting passages, including the following:

“In this report, the author (senior Cadwallader Colden) not only describes the water courses and portages between this state and Canada and those between us and the great western Lakes, with wonderful accuracy, but presents, in the clearest manner, the immense facilities which these water communications are susceptible of affording to our internal trade. He also carries his views beyond the Lakes to the Mississippi, and after stating that ‘many of the branches of that river come so near to the branches of the rivers which empty themselves into the Great Lakes, that in several places there is but a short land carriage from the one to the other;’ he concludes with the following emphatic observation: – ‘If one considers the length of this river (the Mississippi) and its numerous branches, he must say *“that by means of this river and Lakes, there is opened to his view such a scene of inland navigation as can not be paralleled in any other part of the world.”*”

This canal memoir was prepared by the grandson Colden at the request of the Committee of the Common Council of the City of New York, and presented to the Mayor of the City at the celebration of the completion of the Erie Canal. The Colden 1825 memoir was printed by the order of the Corporation of New York in 1825. The memoir contained many reports by the individuals most responsible for the canal’s success.

As President and citizen, George Washington advocated the building of canals throughout our country to enable commerce. He spent many months touring the western part of the explored country on horseback to see the land topography for himself. Included in the long list of honorees at the 1825 canal celebration was George Washington. The following passage was read:

“To George Washington is due the honor of being the projector of canals in the United States. In the fourth edition of Phillip’s *General History of Inland Navigation*, published in London in 1803, we read: The immortal Washington was the original promoter of these canals and improvements, and well did he deserve that admirable motto, – ‘Twice the savior of his country. After conducting her to liberty, he opened her the way to prosperity by new roads and canals, and varying the produce of agriculture.’”

The 1825 Grand Canal Celebration was the most elaborate event in the early history of America. Tens of thousands of invited guests attended the celebration, representing virtually every elected or appointed government official position in New York and at the Federal level. President John Quincy Adams was the featured guest with the three surviving Signers of the Declaration of Independence, as a tribute of profound respect for those memorable patriots who, in its support, pledged “their lives, their fortunes, and their sacred honor.” - John Adams, of Quincy, Massachusetts; Charles Carroll, of Carrollton, Maryland; Thomas Jefferson, of Monticello, Virginia. Included also was the last surviving Major General of the Army of the Revolution, as a tribute of profound respect, for those officers and soldiers whose valour and patriotism, secured to us the blessings we now enjoy - Major-General La Fayette.



The same to the President and Ex-Presidents of the United States, as a tribute of profound respect to those citizens, who by eminent public services have attained the highest office in the gift of the Republic, including James Madison and James Monroe. Hundreds of medals (shown above) were presented to worthy individuals with words of praise for each. One such passage read: “To the family of Robert Fulton, as a tribute of profound respect for the memory of him, who by applying the power of steam to the purposes of navigation, justly ranks amongst the greatest benefactors of his native country, and of the world.

The same praise is offered to the author of the Memoir, Cadwallader David Colden.” (grandson of the senior Cadwallader)

Shown above is the 1825 Erie Canal Celebration Ball Ticket. This is the ‘invitation only’ ticket to the New York City Grand Celebration Ball that was held to honor the arrival of the *Seneca Chief*, the boat on which

Governor DeWitt Clinton sailed down the Canal on Nov. 7, 1825. *Colden Memoir, New York State Library*  
"For the good which has been done by individuals or communities, in relation to this work, let each have a due share of credit." Governor Dewitt Clinton.

This celebration was unlike any prior American event. There was justifiable national pride in completing this great canal, an act that would transform the very young United States into an economic power. The gathering of tens of thousands of people who were important to the worlds of government and science was unprecedented. The position of Colden's image at the top of the famous engraving was proof that the NYC Commission, and the assembled throng of dignitaries at the Grand Canal Celebration, agreed that the true Father of the American Canal System was, indeed, our Cadwallader Colden. At a time when the most beloved Founding Father was George Washington and when many Americans were still referring to Washington, although deceased 26 years earlier, as His Excellency, the honor bestowed upon Cadwallader Colden, to be positioned in the engraving higher than Washington on that November day in 1825 forever cemented his place in history and the memory of his achievements are well preserved for all time.

## The First Canal in America

In the early days, Coldenham was a wilderness and no road existed to connect the Colden home to Newburgh or the Hudson River. Soon Cadwallader Colden would set out to build a road that connected the Hudson and Wallkill Rivers, and we now call this road the Cohecton Turnpike or NYS RT 17K. During the first few years in Coldenham, Cadwallader began to build the farm while his family remained in New York City. In 1727, in his journal he wrote: "On the 15<sup>th</sup> of August we sow'd four and a tenth bushels of rye upon a summer fallow after Indian corn." He recalled other agriculture achievements and the land was soon being cleared to enable the type of farming that would support a family. In 1728 he moved his family to Coldenham, and initially they lived in a small stone and wooden structure while plans were being made to build the large stone family mansion that would be their home. In 1728, Colden wrote: "I have made a small spot of the world, which when I first entered upon, it was the habitation only of wolves and bears and other wild animals, now not unfit



habitation for a civilized family." The location of the original Colden Mansion house, likely built in late 1728, was in the meadow just to the west of the existing Colden Cemetery where the Tin Brook stream turns from westerly to the north as indicated in this 1760 Colden map excerpt (stream highlighted for clarity). See the arrow to the top of the map. This site should not be confused with the later 1767 stone castle home, along the turnpike (Rt 17K) of Cadwallader's son by the same name and often referred to as Cadwallader II. The name of the adjoining road, Stone Castle, was derived from Cadwallader II's fine house.

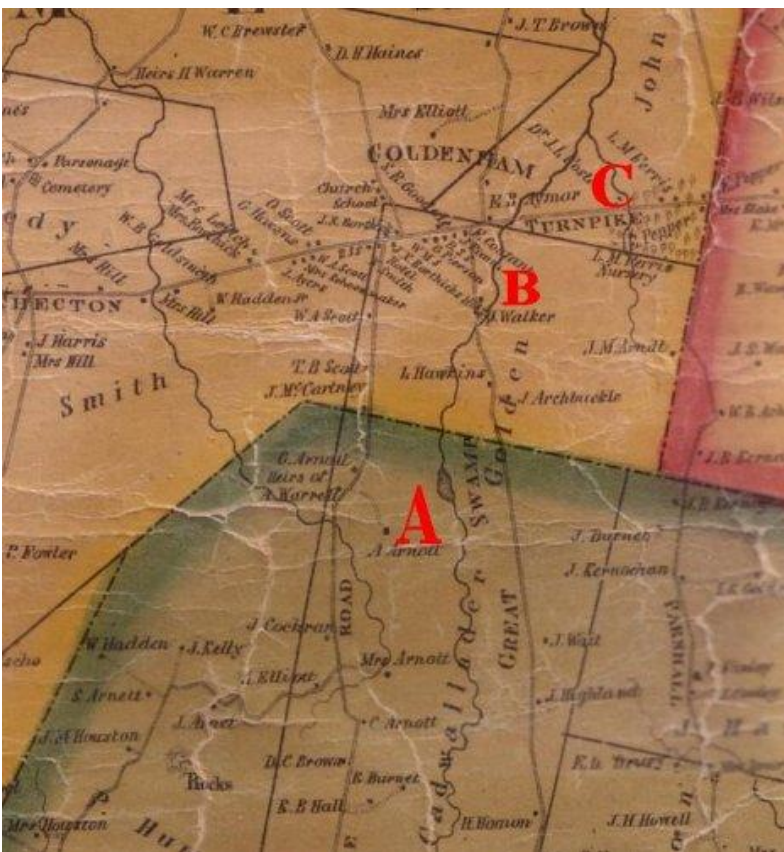
Canals are existing waterways with artificial improvements intended to provide for the transport of goods on boats, sometimes pulled by land animals like horses or mules. Other waterways are aqueducts or ditches and some have claimed to be canals but they do not pass muster in this regard as indicated at the end of this document. The first true canal in America was built by none other than the Father of the American Canal System as a demonstration project at his home in Coldenham, NY. This canal was also to be used to convey heavy cargo, like peat for fuel and stone to build permanent housing structures. Originally known as Coldenham (with the g), this hamlet was where Cadwallader Colden chose to raise his family and where the first American canal would be built.





The primary source of water for this canal was the beautiful Tin Brook stream, shown to the left, and as illustrated in the Colden map shown on the previous page. This is one of two named streams in the Town of Montgomery and its name was possibly derived from an early landowner who lived near the stream's middle point, John Tinne. Other spellings of his name include Thinne or even Tinbrook. Another theory about the stream's name suggests that it was named by Dutch settlers who were the first European inhabitants in the Hudson Valley. In the Dutch language, the name may have meant "thin breaches" when they may have found that the soils around the brook to be thin, or insufficiently deep for the kind of farming they had intended.

Today, the Tin Brook is a wonderful, crystal clear stream that travels from the Great Swale in New Windsor northward along the west side of Maple Ave and crosses Maple at the original Colden Mansion and then north to Rt 17K to make a rather zigzag path to the north of Walden, where it empties into the Wallkill River.



Shown here is an 1859 map excerpt of the general Colden mansion area. Location A is the source of the stream in the Great Swale in the Town of New Windsor. Location B is the site of the original 1728 Colden Mansion, for which there is no visible evidence today. Location C is where the Tin Brook maneuvers toward Stone Castle Road, near the 1767 home of Cadwallader II. This may have been near enough for the canal/stream to have been used also for transporting the stone to the site for building the Cadwallader II castle also

The location of the original Colden Mansion has been a subject of discussion for many years. The actual locations is identified as being just to the west of the existing Colden Cemetery on the family tract. The September 7, 1771 excerpt from the old deed reads, in part, that "The honorable Cadwallader Colden, Esq, Lieutenant Governor of the Province of New York to his son Cadwallader Colden Junior, for natural love and affection and five shillings (description of

land given...) excepting and reserving out of the same, the grave yard of four rods square, which is in the orchard to the east of the old mansion house..." This fixes the original Colden Mansion location as on Maple Avenue, just west of the cemetery.



In 1967, as work was beginning for Route 84, an archaeology survey was conducted by noted historian and archaeologist, Malcolm Booth. In that survey, Mr. Booth was able to identify the remains of the canal construction

used to divert water to a pond to prevent the escape of the water into the swamp. Instead, the pond water could be used to increase stream flow to propel boats. The survey was conducted in the areas mark by the X in the image to the left, which is the end of Maple Avenue along Rt 84.

Mr. Booth reported: “This was the first freshwater canal in the United States, and the first to utilize horsepower to move boats. Apparently begun as a drainage ditch to eliminate a swamp, it was enlarged to allow use by boats when Cadwallader Colden (then Surveyor General and later Lieutenant-Governor of the colony) discovered deposits of peat or building-stone (depending on the source) in the swamp.” Mr. Booth also noted in his survey that the remains of the canal are “gradually becoming filled in” and that “doubtful if anyone realizes what it is.” And that: “Rt 84 has covered a major portion of the canal as of 1967-68, filling part of it with crushed stone.”

Colden likely dug ditches to drain the nearby swamp to enable increased water flow past the family home. In later years, local residents reported that, before the woods were cut off by new construction, all streams were bigger and better. One resident reported that the Tin Brook, if kept clear of fallen trees and branches, would be a strong torrent, even in recent years. Colden enhanced the stream’s flow by building a pond that could be used to release water, at his timing, and propel heavily laden boats. The canal was good transportation through the woods, especially in the days before roads were built.

DeWitt Clinton, grandson of Charles Clinton, Dr. Cadwallader Colden’s friend in the early days, lived near enough in time and place to the Colden Canal to have it influence his thinking. Cadwallader David Colden, grandson of Cadwallader Colden, was in the NY State Legislature in DeWitt Clinton’s time, and he did much to secure the construction of the Erie Canal. The grandson, Cadwallader David Colden, was raised in Coldenham at the home of his uncle, Cadwallader II, in the mansion along the highway. He must have known about the canal and he must have been thrilled by it.

A Scotch gentleman, Walter Rutherford, visited Coldenham and wrote of the Coldens: “From the middle of the woods, this family corresponds with all of the learned societies of the world”

Colden’s grandson wrote about his grandfather: “He was a man of great ability and probity and he maintained a literary and philosophical correspondence with Linnaeus, Dr. Benjamin Franklin...and other distinguished men of his age.” The accomplishments of this fine gentleman live on today.

Today the Great Swale, the source for the Tin Brook stream, is occupied by some true civil engineers from whom much of our knowledge about water management is derived. A fine family of beaver has taken up residence and they have built fine structures there so the area has now returned to nature. Good for them!

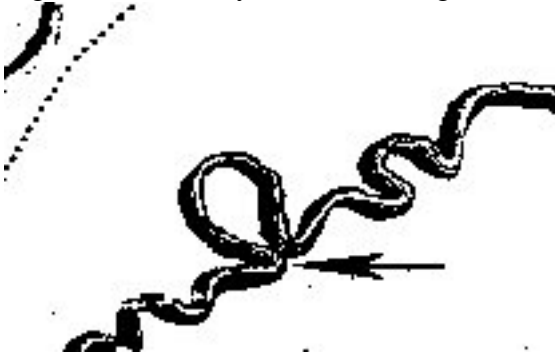
## **Canal Confusion – What is a canal?**

According to Wikipedia, canals are artificial channels for water. There are two types of canals: [water conveyance](#) canals, which are used for the conveyance and delivery of water, and [waterways](#), which are [navigable transportation](#) canals used for passage of goods and people, often connected to existing [lakes](#), [rivers](#), or [oceans](#). For canals used for water supply, see [Aqueduct](#).

This overly broad definition of a canal leaves a lot to be desired. True canals are the water conveyance canals used for water management for the passage of goods and people, often connected to existing rivers and streams.

Allowing aqueducts and water conveyance mechanisms into the definition of a canal does no service to the English language. It is important that we focus our attention on the conveyance of goods/people when speaking of canals.

This NYS Museum image shows a neck in the Mohawk River that caused navigation difficulty during the early Eighteenth Century. Due to the tight turn in the river, boats had difficulty navigating the curve in the neck because the larger boats would ground out at both the front and rear ends of the boat. This was a tight squeeze and the ingenuity of the navigators of the day is impressive.



Workmen cut a ditch through the neck that extended several dozen yards to provide a direct channel at this point in the river. They had to employ dams to stop water flow while the ditch was being built and the resulting direct passage was eventually built to the delight of all who used this river.

This achievement, however significant, has been featured on the NYS Museum as the first canal in New York but the website is not currently being maintained. While significant, it does not belong in the same category of the Colden Canal.

Another achievement occurred in Dedham, Mass, which was first settled in 1635. The settlers needed a mill where corn could be ground. Although the initial settlement was adjacent to the Charles River, the Charles in this vicinity is slow-moving, with little elevation change that could provide power for a water wheel. But a small stream, then called East Brook, had an elevation change of more than 40 feet on its run from near the early Dedham settlement to the Neponset River. Someone in the Town recognized that water could be diverted from the Charles to East Brook to provide the needed water flow. Construction of the ditch was ordered by town officials in March 1639. Thus a ditch, approximately 4,000 feet long, was dug from the Charles River to East Brook, creating what is called Mother Brook today. This, too, was an incredible achievement, especially considering the very early date, but it was a significantly different effort than building a true canal and a totally different type of venture.

The point of this discussion is that the true canals in America were partially real passageways like rivers or streams with artificial construction to better manage the movement of freight and people, like the Erie and Colden Canals. The Colden and Erie Canals fit this description, while the other early canals, however remarkable, do not.



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*Cadwallader Colden*





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