

The Water Supply of New York City

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A lot of the issues facing New York's modern water supply arose during its early history, which is the focus of my *Water for Gotham: A History*, and serves as a lead-in to the current situation.

New York's water story is one of famine and feast, agony and ecstasy, divided at the year 1842. New York had 200-plus years of bad water, and has now had nearly 180 years of good.

Manhattan (which was New York City before 1898) in its natural state before Europeans got here had many streams and ponds in its rocky upper portion, but there was very little, if any, population exploiting those resources. There was plenty of water for natives who came from the mainland to hunt and fish but not enough to support a large permanent population.

As you get further down natural Manhattan to where Center Street is now, there was a big pond called the Fresh Water Pond, later called the Collect Pond; as development encroached around it, it lost its quaint name. Below that pond, in the southern tip of the island, there was very little fresh surface water, very sandy soil, a lot of swamps, and of course that's where the Dutch set up shop in the early 1600s.

For fresh water, the Dutch dug shallow wells. Most of them were briny and the water wasn't particularly good in any of them. It didn't matter too much for drinking because the Dutch basically drank beer. Nobody drank water straight

in those days and the water they got from their wells was boiled in the process of making beer, which was drunk morning, noon, and night, by adults and children.

In the forty years of Dutch rule in Manhattan, there was minimal sanitation. Lots of animal and human waste accumulated in the small town. There was very little environmental awareness. In 1664, a brewer on what is now Beaver Street complained to the city fathers that a tannery was going up next to his brewery and that would probably negatively affect his backyard well from which he got water to make his beer. But the city fathers ruled that because other tanneries had been built before near other people's wells, it was ok in this case as well.

The Dutch give up New Amsterdam to the English later in 1664. One of the reasons Peter Stuyvesant gives for his prompt surrender is that he hadn't dug a well in his fort at the foot of Broadway to water his troops under siege from the English. So, water begins to play a role in New York City's history very early on.

During the English period, wells are the main source of water supply. The English dug the first public street wells; there were only private wells during the Dutch period. The English street wells also weren't very good, so, as the Dutch drank beer, the English turned to liquor and tea, the tea of course with water made palatable by boiling. Nobody drinks water straight.

Again as during the Dutch period, sanitation is minimal, with proto-industrial waste from tanneries, ropewalks, slaughterhouses and so forth adding to animal and human accumulations.

In 1697, a visiting Boston doctor remarks on New York's "nasty and unregarded" streets. In 1702, a "malignant distemper," the first epidemic disease in New York, kills 570 people, then 12% of the population. The government blamed the disease on "our manifold sins, immorality and profaneness," but it was actually yellow fever spread by swamp-breeding mosquitoes. The town of the early 1700s was rich in surrounding swamps and foul standing water.

In 1741 came the so-called "Great Negro Plot", a rumored plot by the town's black population to poison the wells to which many of them were sent to gather water, and then kill all the whites and take over the town. The hysterical official reaction brought the trials and executions of many innocent people.

The event did have one positive effect: the Tea Water Pump. This was a privately owned pump located about where the north entrance ramp to the Brooklyn Bridge now is. It was supplied by one of the many springs that supplied the Fresh Water Pond just to the north. After the scare of 1741 and a resulting law that restricted well water procurement by slaves, the Tea Water Pump water became the Evian of its day. Tea Water Men with big casks on horse-drawn carts deliver the water to subscribers. It's relatively expensive and not affordable for many but, as today, a New Yorker in the 1740s could choose to pay for presumably better water.

Most people still make use of private or the much maligned public wells. A visitor in 1761, who had found "excellent, fine water" from Philadelphia street pumps, comes to New York and says "the water is very bad." Another traveller, English scholar Andrew Burnaby, had concluded during a visit the previous year:

“New York is subject to one great inconvenience, which is the lack of fresh water.”

In 1774 is the first attempt to do something serious about New York’s lousy water. Christopher Colles, an Anglo-Irish self-taught engineer, embarked on many projects during his long life in America, few of which succeeded. In his older years, he is supposed to have said, “Had I been brought up to make hats, people would begin to come in to the world without heads.”

After arriving in Philadelphia a few years earlier, Colles comes to New York in 1774 with a plan to build the “New York Waterworks,” which would have been the first piped water supply in the colonies. This was a public venture, supported by public money, with Colles earning only a relatively small salary as engineer. He succeeded during the next two years in building a large well to the northwest of the Fresh Water Pond (pristine high ground at what is now Broadway and Leonard Street), a two million gallon reservoir, and a steam engine to pump the water from the well into the reservoir. In building that steam engine, Colles was probably responsible for the second steam engine made in America. He had built the first one the year before in Philadelphia.

But, by 1776, Colles hadn’t laid any of the hollowed log pipe which was the distribution part of his plan. When the British take over the city in late 1776, they promptly destroy his waterworks as a symbol of colonial ingenuity. Patriotic Colles flees, and that’s it for his waterworks which never supply a drop of water to the city.

During the Revolution, an English visitor observes that “a treatise upon stinks” could be written about the city, so the sanitation situation certainly didn’t improve during the occupation.

During the early American period, the city is rapidly expanding northward and very little is being done about sanitation or water.

1798 brings the worst of the city’s occasional yellow fever epidemics since 1702: two thousand people, about 1 in 30, die.

This epidemic gives an idea to the notorious Aaron Burr: to water the city from the mainland Bronx River (then part of Westchester, now in the Bronx). The water plan was really a cover, though, for his intention to start a bank. This is a long and convoluted story which takes a chapter of the book to tell.

Briefly, what happens is that Burr, as the state assemblyman at the head of New York City’s legislative delegation, runs the consideration of his own plan to incorporate what is to appear as a water company. The resulting Manhattan Company promptly forgets about the Bronx River and builds a rudimentary waterworks on the south side of the Fresh Water/Collect Pond, just north of Chambers Street. Over the next forty years, the company supplies very little water to private subscribers through a network of leaky, often clogged log pipes, but powerful company lawyers prevent all comers from creating an adequate water supply. Why? Because the Manhattan Company’s charter says it has to be a water company in order to pursue its side business, the immensely profitable Bank of the Manhattan Company, surviving as today’s Chase Manhattan.

In 1807, Washington Irving dubs New York “Gotham,” after the old English fools of Gotham, and in no other way has New York been more foolish than in not providing itself with water.

In 1810, a former Manhattan Company director--Brockholst Livingston, of the old Livingston family and then a U.S. Supreme Court justice--writes about New York: “Inhabitants in their water are drinking a proportion of their own evacuations, as well as that of their horses, cows, dogs, cats, and other putrid liquids so plentifully dispensed.”

In 1832, Asiatic cholera comes to the New World for the first time, killing 3,500 New Yorkers, which is then about 1 in 60, still an astounding number. This time, civic leaders decide that something must be done about the water, which they suspected had something to do with the disease, if only because cholera patients demanded it and doctors had little to offer. They had no idea that cholera was spread by polluted water, passed in New York from the privy to the well beside it.

Leading the effort was Myndert Van Schaick, a committed Democrat, a founder of NYU, and a horrified alderman during the 1832 cholera epidemic. Over the next five years, the city plans and designs an aqueduct from the abundant and pure Croton River in what was then remote northern Westchester. Van Schaick decided early on that the Bronx River wouldn't do; in the thirty years since it was first considered, it had been encumbered by numerous dams, and its quality and quantity were questionable.

Voters give overwhelming support to go ahead with the Croton project in an 1835 referendum; the only wards that had majorities against were the two poorest, though they had the most to gain in improved living conditions, and the ward that comprised what is now Greenwich Village but was then on the outskirts of the city and had the best wells.

Later in 1835, as the planning continues but before work begins, New York experiences its worst disaster prior to a few weeks ago. The Great Fire of December 1835 starts accidentally in a warehouse near Wall Street and, driven by a bitter northwesterly wind, destroys 700 buildings south and east of Wall Street. It's an horrific event. Philip Hone, the ex-mayor and later famous diarist, writes: "How shall I attempt to describe the most awful calamity which has ever visited these United States? I am fatigued in body, disturbed in mind, and my fancy filled with images of horror which my pen is inadequate to describe."

You could probably graft that quote onto the event of a few weeks ago and it would hold. A couple of days ago I gave a slide talk to a third grade public school class. When they saw the slide of a color painting of the 1835 fire, with flames all over the place, all of the kids seemed to think it was related to the World Trade Center. And I think it gave them some comfort to know that the city has experienced a disaster like this (though of a different making) before.

At any rate, the fire of 1835, for which there was no water to put it down, certainly convinces just everybody that the Croton Aqueduct is the thing to do. Construction begins in 1837, with growing opposition from Westchester landowners. One fellow, Theodorus Van Wyck, writes: "If the rivers of

Westchester County are to be taken from it, how is it to rise in arts, manufacturing, and farming?" So, here's the beginning of the city-watershed relationship, not always a smooth one.

There are some engineering issues as the aqueduct construction continues. The main one is how to cross from the mainland onto Manhattan: on a low bridge or a high bridge. The lead engineer, John Jervis, who went on to build many American railroads and other great engineering works, wants a low bridge essentially because he's frugal and it's a lot easier to build an embankment that blocks the Harlem River and then lay a pipe siphon on top of it. But landowners on the Westchester (now Bronx) side, featuring the Morris family (namesake of today's Morrisania section) decide that they want a high bridge because it would be a glorious example of engineering and, of course, raise land values on either side of the bridge.

When the Water Commissioners who were appointed to oversee the building of the Croton announce a solicitation for bids in 1837 to build a low bridge, the Morrises and others get into boats and hack apart one of the few existing bridges across the river, the original Macombs Dam Bridge which had been built out of wood a few years earlier without a mandated draw to allow boats through. The landowners figured if they got rid of one of the impediments to navigation on the Harlem River, that would help their cause against any more low bridges. And in fact it did, because the state legislature stepped in and ordered a high bridge, and that's the bridge that's there now, crossing the Harlem at 174th Street. It doesn't look now like it did then because in the 1930s a large steel arch

replaced the numerous stone piers which supported smaller arches across the river.

The aqueduct was built by four thousand Irish, mostly recent immigrants. The people of Westchester, especially people like old Washington Irving, decried the presence near their estates of Irish in disparaging ways typical for the times. Irving in particular wasn't happy that the aqueduct was crossing very near his Sleepy Hollow estate.

In 1840, there was a great labor revolt, the "Croton War," which stopped work for at least a month. The *New York Herald*, then a new penny paper, mocked the whole affair, running cartoons on its front page, and disparaging the laborers who supposedly were all drunk and the contractors who refused to continue their operations until the militia restored peace and arrested the rabble rousers.

But, the aqueduct did get built and very successfully, opening in 1842. The Murray Hill Reservoir was the terminus of the water which started with a dam on the Croton, passed through Westchester, crossed the Harlem on the High Bridge, came down Manhattan to the York Hill Reservoir in what was then open land (now in Central Park), and finally in pipes to Murray Hill for distribution by cast iron pipe to settled areas further south.

After the Croton system was expanded and the other mainland reservoirs built, the Murray Hill Reservoir was removed in the 1890s to make way for the current public library building. But, on opening day, July 4, 1842, young Croton assistant engineer Fayette Tower was filled with awe: "At an hour before the rays of the sun had gilded the city's domes, I stood on the topmost wall of the reservoir

and saw the first rush of water as it entered the bottom and wandered about as if each particle had consciousness.” Not bad for an engineer.

Philip Hone wrote about the opening of aqueduct: “Nothing is talked of, or thought of in New York but Croton Water. Water! Water! is the universal noted which is sounded through every part of the city, and infuses joy and exaltation into the masses.” If you can imagine how the city had suffered from a lack of good water for so long, Hone’s was a very common sentiment: the Croton Aqueduct was truly the deliverance from filth, disease, and fire.

The city whose water affairs is most popularly known, Los Angeles, because of the movie *Chinatown*, had William Mulholland as the creator of its first great aqueducts and dams in the early 1900s. In 1905, Mulholland said: “A city quickly finds its level, and that level is its water supply.”

After the original Croton was expanded through the 1800s, the much larger Catskill system comes on line in the 1910s from west of the Hudson River, and completed in the 1960s is the larger still Delaware system, bringing mountain water from as far as 125 miles northwest of the city. These days 90% of the city’s water comes from the two 20th century supplies, and just 10% from the Croton system.