HOW WATER BECAME PUBLIC IN PROGRESSIVE-ERA NEW YORK, 1883-1917

by

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Abstract

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Four distinctive features of this historical period prompted the City of New York to undertake water management. First, the severe drought of 1881 forced the city to expedite construction of the New Croton Aqueduct in 1883. While the city was building the new aqueduct, the urban public began to spend their leisure time at the High Bridge, which monumentalized the Old Croton Aqueduct and raised awareness of public water. Second, the cholera scare of 1892 prompted the city to protect the Croton watershed from pollution. Third, the high-profile derailment of an intricate scheme of graft, in 1899, drove city officials to begin to eliminate private water companies and to increase vigilance about municipal corruption related to water. Fourth, the consolidation of Greater New York increased city and state power and improvements in municipal finance facilitated a new public water bureaucracy, which allowed the city to build, manage, and pay for its own water system, marked by the completion of the Catskills system in 1917.

The management of water serves as an early example of government intervention in New York, which began before public schools, before the subway, and before government regulation of private gas and electric companies. Support for the idea of public water emerged as early as 1835 when the public voted in favor of building the city-run Croton water system, but public

water was not on solid ground until much later. In fact, the idea of public water preceded the necessary infrastructure, bureaucracy, and finances required to make it possible. While no municipal operation is ever wholly public or private, between 1883 and 1917, the notion of public management of water triumphed in New York. It was during this long historical moment that city officials and New Yorkers began to think of, and to treat, water as a public resource. By providing a new synthesis of the cultural, economic, political, and social history of water in New York during this critical period, this study emphasizes the complexity and contingency in the story of how New York's water became public.

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INTRODUCTION

This study examines how water became an essential public resource in New York City between 1883 and 1917. Rather than remaining a partially privately controlled commodity, water emerged as a public utility, managed by the city, with the backing of the state. Given the complexity of resource management, no municipal operation is ever wholly public or private.[1] Yet, between 1883 and 1917, public management of New York's water supply triumphed. This development was the result of a combination of factors, which coalesced at this particular historical moment, with lasting implications for shaping the role of government. In order to understand how water became public, with a permanent bureaucracy and value-system that supported it as the only publicly managed utility in New York, an examination of the years spanning from the Gilded Age to the Progressive Era is essential.

Water serves as an early example of government intervention in New York. Before public schools, before city involvement in the subway, and before government regulation of private companies managing gas and electricity, the city provided water to citizens. Support for the idea of public water emerged as early as 1835, when the public voted in favor of building the city-run Croton water system, but public water was not on solid ground until much later. In fact, the idea of public water preceded the necessary infrastructure, bureaucracy, and finances required to make it possible. Throughout the nineteenth century, New Yorkers experienced and participated in the evolving role of water as it morphed from being solely a method to extinguish fires to becoming a popular beverage.

In comparison to Philadelphia, New York was a latecomer to the permanent, public

[1] Martin V. Melosi considers this phenomenon of municipal management not being 100% public in his recently published series of essays. See Martin V. Melosi, *Precious Commodity: Providing Water for America's Cities* (Pittsburgh: University of Pittsburgh Press, 2011).

management of water. Benjamin Franklin left money in his will to be used by the city of Philadelphia to manage water supply and, by 1798, that city had launched a publicly supported water system.[2] Other cities hired private water companies initially and then replaced them with public management. Boston enlisted private water companies in the early 1800s to manage the city's water supply. However, a damaging fire in 1825 prompted Mayor Quincy Sr., a staunch opponent of private management of water, to plan for a public water system.[3] In early 19th century Baltimore, private companies managed water sources for extinguishing fires, for domestic use, and for drinking.[4] Previous studies claim that New York followed the same pattern as Boston, hiring private water companies initially and then replacing them with a public apparatus to manage water.

Scholars interpret New York as having completed the transition to the permanent public management of water after the failures of the private Manhattan Company's waterworks in the 1830s and with the initiation of the public Croton system in 1842.[5] However, the idea of public water preceded the necessary infrastructure, bureaucracy, and finances needed to make it possible and permanent. Furthermore, private company involvement in New York's water did not cease entirely after 1842. By examining the period from 1883 to 1917, the current study reveals a more nuanced and complicated picture, which introduces more ambiguity into the delineation between public and private management of water.

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[2] Nelson Blake, *Water for the Cities: A History of the Urban Water Supply Problem in the United States* (Syracuse: Syracuse University Press, 1956), 248. In its early choice of public management and its decision not to deviate from it, Philadelphia was exceptional. Edwin G. Burrows and Mike Wallace, *Gotham: A History of New York City to 1898* (Oxford: Oxford University Press, 2000), 360-361.

[3] Blake, *Water for the Cities*, 173-175. David Cutler and Grant Miller, "Water, Water Everywhere: Municipal Finance and Water Supply in American Cities," in *Corruption and Reform: Lessons from American Economic History*, eds. Edward L. Glaeser and Claudia Goldin (Chicago: University of Chicago Press, 2006), 161.

[4] Blake, *Water for the Cities*, 77.

[5] See Gerard T. Koeppel, *Water for Gotham: A History* (Princeton: Princeton University Press, 2000) and Nelson Blake, *Water for the Cities: A History of the Urban Water Supply Problem in the United States* (Syracuse: Syracuse University Press, 1956).

Rather than presenting a simple narrative about great men of government saving the day as they shepherded water along a straightforward trajectory to publicity, this study reveals the mix of public and private involvement in water in the New York context. This dissertation contemplates four sets of actors, some well known and others not, who, over time, pushed the permanent, public management of water. The first set was non-human actors or forces, such as drought, fire, and disease; the second included politicians committed to government's acquisition of power; the third encompassed various charismatic individuals who took matters into their own hands; immigrants, tourists, and New York's general public comprised the fourth set.[6] In a variety of ways, each group drove the process of water becoming and remaining public.

In addition, four distinctive features of this historical period from 1883 to 1917 prompted the City of New York to undertake water management. First, the severe drought of 1881 forced the city to expedite construction of the New Croton Aqueduct, which it began in 1883 and completed in 1890. Second, the cholera scare of 1892 prompted the city to protect the Croton watershed from pollution. Third, the high-profile derailment of an intricate scheme of graft in 1899 drove city officials to begin to eliminate private water companies and to increase vigilance about municipal corruption related to water. Fourth, the consolidation of Greater New York in 1898, increased city and state power, and improvements in municipal finance facilitated the creation of a new public water bureaucracy in 1905, which allowed the city to build, manage, and pay for its own water system, marked by the completion of the Catskills System in 1917.

At first glance, it may seem that the removal of private companies from water and the

[6] This classification of human and non-human actors derives from Bruno LaTour's actor network theory. See Bruno Latour, *Reassembling the Social: An Introduction to Actor-Network Theory* (Oxford: Oxford University Press, 2005). This study does not address immigrant labor and daily life on the public work projects as that is a larger topic which has been contemplated elsewhere. See Diane Galusha, *Liquid Assets: A History of New York City's Water System* (Fleischmanns: Purple Mountain Press, 2002).

beginning of municipal water management are part and parcel of the same phenomenon. However, the management of New York's water supply vacillated between public and private, with the two systems at times coexisting. After the Ramapo scandal in 1899, the formal creation of the public Board of Water Supply in 1905 marked a decisive victory for municipal management. Yet, some private companies continued to operate in the boroughs, some until 1917 and others even later, as the city began the gradual process of taking them over, regulating their water rates, and incorporating their infrastructure into the city's system.

Chapter 1 shows that prior to 1883, public and private management of water co-existed in New York. Drinking water fountain projects run by private charities revealed the city's shortcomings in water supply, as water became a popular beverage in the 1880s. Chapter 2 explores the powerful effect of a national drought on the city accustomed to an abundance of water and how this experience with scarcity drove city officials to expedite plans for the construction of a new aqueduct. While the city was building the New Croton Aqueduct and publicizing its progress, the urban public began to spend their leisure time at the High Bridge of 1848, which served to further monumentalize this aqueduct and to support the notion of public water. Both city bureaucrats and citizens began to treat water as a public resource. Chapter 3 focuses on water's connection to sanitation and disease prevention, especially in light of the cholera scare of 1892, and shows that the miasma theory of disease transmission persisted, even after discovery of germ theory in 1883. Removing filth from proximity to the water source in the Croton watershed became government work and the city and state began to take on a larger role in sanitation to assure water purity.[7] The general public had believed impure drinking water to

[7] This study is not a history of the sewer system, which is a separate topic of a scope too large to be addressed here. For scholarship on sewers, see Joanne Abel Goldman, B*uilding New York's Sewers: Developing Mechanisms of Urban Management* (West Lafayette: Purdue University Press, 1997) and Maureen Ogle, *All the Modern Conveniences: American Household Plumbing, 1840-1890* (Baltimore: John Hopkins University Press, 2000).

be a danger to health for decades, but it was only after 1892 that government officials were motivated to build a permanent bureaucracy to secure the purity of the drinking water supply. Chapter 4 explores the profound impact of one specific political scandal on water becoming public. In 1899, the private Ramapo Water Company, along with some Tammany Hall Democrats and some members of the Republican Party, attempted to take over the management of the city's water. It was this event that prompted the municipal government to secure the power of eminent domain. Chapter 5 reveals that once New York City had acquired the bureaucratic structure and the requisite legal power, it was then able to build and manage what was to become the largest public water system in the world.

Why another study of New York City's water history? Several scholars have chronicled the evolution of New York's water system, among them Nelson Blake, Charles H. Weidner, and Gerard T. Koeppel. Yet such works focus mainly on developments in engineering told from a top-down approach. The political, social, cultural, and economic history of water in New York City has not been addressed. The current literature on water is fragmented by discipline. Water histories focus on architecture and engineering; the public health scholarship examines reactions to specific epidemics, some of which involved water; metropolitan history studies the inter-relationship between city and country; and the urban reform literature traces the rise of municipal involvement in the regulation of utilities, such as gas and electricity, but not water.[8] The

[8] Nelson Blake's *Water for the Cities: A History of the Urban Water Supply Problem in the United States* (1956) employs a comparative methodology by analyzing the establishment of public water systems in Philadelphia, New York, Boston, and Baltimore between 1790 and 1860. In *Water for the City: A History of New York City's Problem from the Beginning to the Delaware River System* (1974), Charles H. Weidner details a narrative of a century of increasingly complex construction projects without examining the politics behind New York's water policy development. Gerard T. Koeppel's *Water for Gotham* (2000) reveals the lack of government action to bring fresh water from outside the city to New York from colonial times until 1832. Koeppel's study culminates in 1842 when the first water from Croton arrived in New York. In *Liquid Assets: A History of New York City's Water System* (2002), Diane Galusha covers the entire history of the water system in one volume, thereby extending Koeppel's narrative and capturing the tensions between city and state. *Water-Works: The Architecture and Engineering of the New York Water Supply* (2006), inspired by the newly unearthed collection of visual records of the Department of

extensive body of work addressing the Progressive Era contemplates a common vocabulary of reform to include anti-monopolism, the rise of the expert, and the expansion of government power. However, the question of how Progressive Era reformers turned to deal with the issue of water and how water came to be seen as a public responsibility is largely ignored in this body of literature. When water supply is mentioned, it is in the context of an inevitable trajectory toward public management, which is inaccurate.

Scholars of metropolitan history have argued that the modernization of nineteenth century cities in North America and in Europe was completed in order to facilitate capital investment.[9] While this argument is compelling, capitalist imperative cannot alone explain the city's heightened efforts to meet the ever-increasing need for water.[10] This argument focuses disproportionately on influential elites as the agents of change while downplaying the role of scientists, reformers, bureaucrats, immigrants, the general public, and nonhuman factors. Since control of water vacillated between public and private control, there is no a priori reason to believe that public management would ultimately win out. Furthermore, public management and private entities can mix, requiring constant negotiation between them, as we see in the cases of mass transit and of water.[11] By providing a new synthesis of the cultural, economic, political, and social history of water in New York during the critical period of 1883 to 1917, this study

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Environmental Protection archive, focuses on architecture and engineering. The seminal source still cited in current work is that of John Duffy, *A History of Public Health in New York City, 1625-1866* (1968) which looks at developments in sanitation from the Dutch settlement until the creation of the Metropolitan Health Act. Historian Kenneth Finegold in *Experts and Politicians: Reform Challenges to Machine Politics in New York, Cleveland, and Chicago* (1995) explores how the integration of experts into urban politics brought about urban reform.

[9] Matthew Gandy, *Concrete and Clay: Reworking Nature in New York City* (Cambridge: MIT Press, 2002), 37.

[10] David Harvey's approach to studying the city demonstrates the powerful link between urbanization and capitalism and contemplates the dramatic growth of cities as a reaction to excess capital. See David Harvey, *Paris, Capital of Modernity (*New York: Routledge, 2006) and David Harvey, *The Condition of Postmodernity: An Enquiry into the Origins of Cultural Change* (Malden: Blackwell Publishing, 1990).

[11] For an excellent discussion of the mixing of public and private management, see Jessica Wang, "Dogs and the Making of the American State: Voluntary Association, State Power, and Politics of Animal Control in New York City, 1850-1920," *Journal of American History* 98 (2012): 998-1024.

emphasizes the contingency in the story of how New York's water became public. Private management could have prevailed. Why it did not is the subject of the following pages.

CHAPTER 1:
From Extinguishing Fire to Quenching Thirst: Water in New York, 1658 to 1883

For almost all inhabitants of the island that would be renamed New York in 1664, access to drinking water was a constant daily struggle. A small network of local wells provided the settlement's water. Settlers dug the first public well at the present-day intersection of Bowling Green and Broadway in 1658. In these years, wealthier residents were able to draw water from their own wells or to pay for water from proprietors who peddled water to their neighborhoods on carts. The poor, however, were dependent on an unreliable series of public wells, where water, considered by some to be "impure and injurious," could be obtained free of charge.[1] Wells drew on subterranean streams, which were mapped out by Egbert Viele many years later.[2] The Viele map (figure 1.1) shows the subterranean stream system of Lower New York.

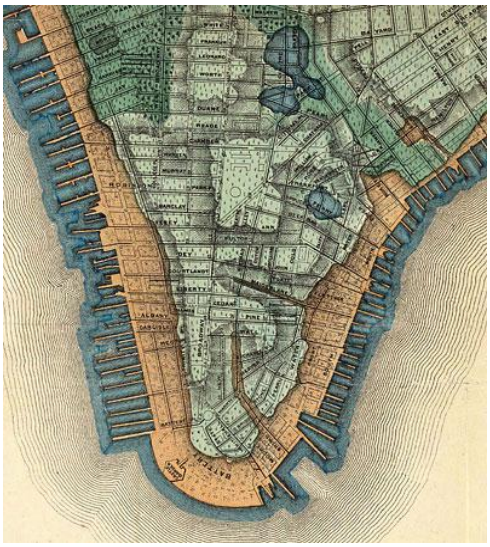

Figure 1.1: Section of Viele map, 1865 *New York Times*, accessed March 24, 2011, http://graphics8.nytimes.com/images/2006/06/11/nyregion/thecity/11viele450.jpg.

A network of public and private wells sustained the early settlement. Residents supplemented water drawn from these supplies with rainwater collected in wooden or stone

[1] I.N. Phelps Stokes, *The Iconography of Manhattan Island: 1498-1909* (New York: Arno Press, 1915), 635.
[2] Julia Solis, *New York Underground: Anatomy of a City* (New York: Routledge, 2004), 12-13.

cisterns.[3] In 1686, when the Common Council ordered that nine more public wells be built, it stipulated that these wells were to be made of stone, "one halfe of the Charge of them to be borne by the inhabitants of every Streete proportionately and the other halfe by the Citty."[4] In the colonial period, water represented a public-private partnership between the Common Council, which was the city's governing body, and local homeowners.[5] The main function of the public wells at this time was fire control. In the early eighteenth century, a volunteer fire department fought fires with pumps, wells, and buckets. By 1730, this system proved inadequate and the Common Council raised a tax in order to fund fire engines for the city based on the models created in England. In 1737, the city established a regular fire department. The Common Council created the "firemen of the City of New York" by selecting up to forty-two "strong able discreet honest and sober men" who would be on call twenty-four hours a day to extinguish fires.[6]

Sufficient water quantity was already a challenge, but the quality of this scarce supply soon presented complications. Well water was for domestic use, including laundry, cooking, and cleaning. It was not suitable for drinking, as it was "brackish and disagreeable to the taste."[7] "Tea water," a higher quality drinking water drawn from select wells, was sought for drinking. One such well belonged to Geradus Comfort, a cooper. Comfort sold kegs of "Comfort's Tea Water" to well-to-do families, who sent their African slaves daily to carry the water home. In an incident of 1741 later called the "Great Negro Plot," New York's white wealthy class feared that the slave population was plotting to poison this main source for drinking water. Because

[3] Matthew Gandy, *Concrete and Clay: Reworking Nature in New York City* (Cambridge: MIT Press, 2002), 24.
[4] Edward H. Hall, *Water for New York City* (Saugerties: Hope Farm Press, 1993), 18.
[5] Hall, *Water for New York City*, 18. See p 19-20 for detailed description of how neighborhood residents would petition the Common Council for a well and how the finances and the management of these public wells were a shared responsibility.
[6] Hall, *Water for New York City*, 28-31.
[7] Hall, *Water for New York City*, 21.

Comfort was known to leave the well supervision to his slave, Jack, and because Comfort's well was next door to a disorderly tavern that served liquor to a mixed crowd, rumors began to spread about a "Negroe plot" run by the tavern keeper in collusion with Jack to poison the well and seize power from principal New York families. Although no definitive proof of this plot ever emerged, at the conclusion of the dramatic trial of the case, four whites were arrested, seven whites were banished, eighteen blacks were hanged, thirteen blacks were burned at the stake, and seventy blacks were banished. In an effort to prevent any potential future conspiracies, the city passed new legislation in 1742 mandating that slaves may only acquire water from the nearest neighborhood well.[8]

In addition to local wells and rainwater collection, city residents relied on a 48-acre pond located outside the city settlement in lower New York.[9] Situated in the Kalckhook territory, the pond was known as "The Collect"[10] (figure 1.2). In the early eighteenth century, a fresh

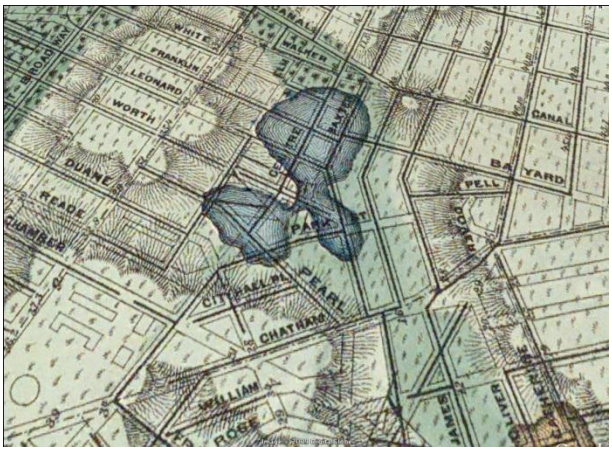

Figure 1.2: Map of the Collect, Ecotone Projects.com., accessed March 24, 2011, http://ecotoneprojects.files.wordpress.com/2009/01/090111viele_collect.jpg.

water spring, located on the north side of present-day Park Row between Baxter and Mulberry Streets, attracted residents' attention. The underground source of this spring may have been the

[8] Gerard T. Koeppel, *Water for Gotham: A History* (Princeton: Princeton University Press, 2000), 28-31.
[9] Hall, *Water for New York City*, 21.
[10] "Old New York Exposed: A Locality Around Which Great Historical Events Cluster," *New York Times*, August 26, 1888, 8.

same as that which supplied the nearby Collect pond. Because this water was pure enough for making tea, the Tea Water Pump which delivered it quickly became a neighborhood landmark, appearing frequently in real estate records and deeds of the time.[11] The Tea Water Pump began service in the late 1730s or early 1740s. The fresh water spring accessed through this pump garnered the attention of Swedish professor and botanist, Peter Kalm. When he visited New York in 1748, he described the city's water in his travel diary.[12]

> There is no good water to be met with in the town itself: but at a little distance there is a large spring of good water, which the inhabitants take for their tea and for the uses of the kitchen. Those, however, who are less delicate on this point make use of the water from the wells in the town, though it be very bad. The want of good water lies heavy upon the horses of the strangers that come to this place for they do not like to drink the water from the wells of the town.[13]

At this time, water was not a staple beverage. Citizens boiled their well water and drank it mixed with alcohol. The favored libation of New Amsterdam had been beer, whereas New Yorkers generally preferred rum. In 1773, three hundred and ninety-six official taverns and countless unlicensed sellers supplied New York's population of twenty two thousand people with drink, making liquor readily available to rich and poor alike. Tea and coffee slowly emerged to join hot chocolate as popular non-alcoholic options in the 1770s, but the breakfast beverage remained warm beer.[14]

Drinking water was a commodity for sale and selling water was an entrepreneurial venture. Those residents who could afford to pay for water purchased it from local salesmen. Private dealers, called "teawater men," sold water drawn from the Tea Water Pump, charging

[11] This address also appears as "on the corner of Chatham and Pearl Streets." See "From Croton to Town," *Appelton's Journal of Literature, Science, and Art*, vol VIII, No. 171, 1872:16. Hall, *Water for New York City*, 21.
[12] Koeppel, *Water for Gotham*, 31.
[13] Hall, *Water for New York City*, 22.
[14] Koeppel, *Water for Gotham*, 33-34.

one cent per gallon.[15] Patrons could come to the Tea Water Pump to pump and purchase water, or they could buy it remotely from the teawater men, who peddled the water throughout the city on carts[16] (figure 1.3). This tea water was "sparingly used as no common luxury."[17] Enough

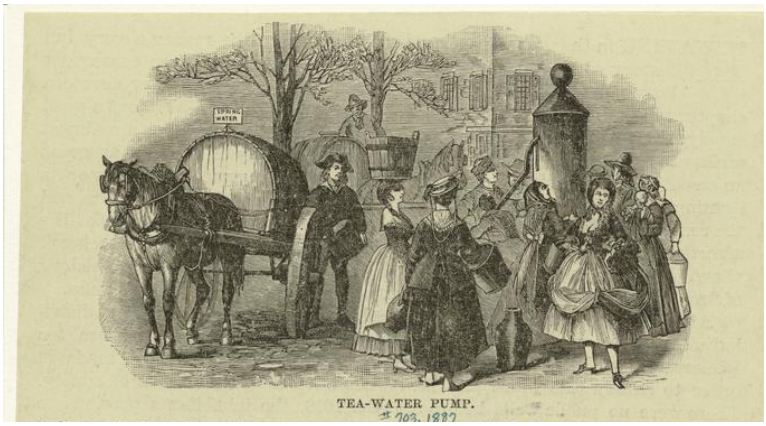

Figure 1.3: Tea-water pump. Print published in 1887, but depicting a scene from 1790. From *Our firemen: a history of New York Fire Department* (New York: A. Costello, 1887). New York Public Library Digital Gallery, accessed December 15, 2011, http://digitalgallery.nypl.org/nypldigital/, Courtesy of The New York Public Library. www.nypl.org.

teawater men were doing a swift business that the Common Council passed a law to license these sellers and to regulate their trade. A decorative grounds called the Tea Water Pump Garden arose around the pump and it became a fashionable destination where those with means could purchase beverages made with the pure water.[18]

By 1774, every house in the city relied at least in part on the Tea Water Pump for its drinking water supply.[19] However, the forty-five shilling per year cost was a significant drain on

[15] Diane Galusha, *Liquid Assets: A History of New York City's Water System* (Fleischmanns: Purple Mountain Press, 2002), 13. One cent from 1774 is worth .28 cents from 2010 using the Consumer Price Index, which estimates amount we would need to purchase it today, and $5.08 using the Unskilled Wage, which measure how affordable the item would be today. Measuring Worth.com, accessed May 6, 2011, http://www.measuringworth.com/.
[16] Hall, *Water for New York City*, 23.
[17] "From Croton to Town," *Appelton's Journal of Literature, Science, and Art*, 16.
[18] Hall, *Water for New York City*, 23.
[19] Koeppel, *Water for Gotham*, 34-36.

limited budgets.[20] Since not all citizens could afford to pay the market price for water, the city recognized the continued need for the public well system.[21] With this concern in mind, Christopher Colles in 1774 became the first proponent of a water supply system for New York delivered through underground pipes. The Irish-born Colles emigrated to Philadelphia in 1770 after being involved in several failed water projects in his home country, including the construction of a canal at the Shannon River.[22] An engineer, geographer, and inventor, Colles proposed a public enterprise water infrastructure, which he would build and oversee.[23]

On April 22, 1774, Colles presented his plan to the Common Council. He aimed to build a reservoir near the Collect, pump the water from a well into the reservoir, and distribute this water by gravity through wooden pipes to local residences. The Council hesitated to commit to the novel idea, taking three months to debate before deciding to fund the project.[24] On July 21, the Council issued 2500 pounds in promissory notes, an early instance of waterworks-related public spending managed by the city government.[25] The city gave Colles the go-ahead to begin work on the reservoir, well, and pump house, to be called The New-York Waterworks. Construction proceeded until 1776, when the events of the American Revolution interrupted the

[20] Koeppel, *Water for Gotham*, 32-41. Each house paid 1 penny and ½ per day, making the annual cost 45 shillings. 45 shillings a year in 1774 is worth $1,250 from 2010 using the Consumer Price Index, which estimates amount we would need to purchase it today. Measuring Worth.com, accessed June 30, 2011, http://www.measuringworth.com/.
[21] Koeppel, *Water for Gotham*, 32.
[22] Koeppel, *Water for Gotham*, 36-38. Deborah Popper, "Poor Christopher Colles: An Innovator's Obstacles in Early America," *Journal of American Culture* 28 (2005): 178-190, accessed March 24, 2011, doi.org/10.1111/j.1542-734X.2005.00162.x.
[23] Popper, "Poor Christopher Colles: An Innovator's Obstacles in Early America," 178. Kevin Bone and Gina Pollara (eds), *Water-Works: The Architecture and Engineering of the New York City Water System*. (New York: Monacelli Press, 2006), 30.
[24] Hall, *Water for New York City*, 36.
[25] 2500 pounds in 1774 is worth $69,7000 from 2010 using the Consumer Price Index, which estimates amount we would need to purchase it today. Measuring Worth.com, accessed June 30, 2011, http://www.measuringworth.com/. See also Charles King, *A Memoir of the Construction, Cost, and Capacity of the Croton Aqueduct…together with an account of the Civic Celebration* (New York: Printed by C. King, 1843), 86.

project.[26] That year, the British destroyed the reservoir and Colles fled the city.[27] The project was never resumed.

During the Revolution, the city of New York, under British occupation, suffered from destructive fires, drought, and deforestation, resulting in a severe lack of groundwater. The system of public wells fell into disrepair during the occupation. Hessian soldiers dug wells, but struck no water. After the Revolution, the Tea Water Pump and the Collect remained the main source for drinking water. During this time, the reputation of the Tea Water Pump's water quality began to decline, as local press reported that people had taken to washing their laundry in the Collect near the pump.[28] Eventually, the Collect "became a nuisance and an eye-sore: dead animals and every species of rubbish and offal were thrown into it, and occasioned an insufferable stench."[29] By the 1780s, the water quality of the Collect had declined dramatically, rendering its water no longer safe for drinking.[30]

Even at this early stage, the management of water supply was cumbersome. The city hired individuals to maintain the pumps and wells. On April 5, 1785, the city contracted with William Smith to pay him 140 pounds per year to maintain wells and pumps.[31] But as the number of pumps and wells increased at a rapid rate, the cost of keeping them in good repair also mounted. In short, Smith's job was not profitable or manageable. Next the Common Council created a new system in which two men were elected to oversee the pumps and wells in each ward. However, these elected officials at times neglected their duties, which led the Common Council to issue an order on September 16, 1789, stating "that whenever the Overseers of the

[26] Hall, *Water for New York City*, 38.
[27] Popper, "Poor Christopher Colles: An Innovator's Obstacles in Early America," 181.
[28] Koeppel, *Water for Gotham*, 50-51.
[29] Henry Collins Brown, ed., *Valentine's Manual of Old New York* (New York: Valentine's Manual Inc., 1924), 143.
[30] Galusha, *Liquid Assets*, 15.
[31] In 1790, 140 pounds is worth $135,000 in 2009 using the GDP per capita calculation. Measuring Worth.com., accessed June 15, 2011. http://www.measuringworth.com/

Public Wells and Pumps neglect or refuse to do their duty that the Aldn & Assist of the Ward direct the necessary Repairs: lest by the want of water from the public wells and pumps the City may be endangered by Fire."[32] These laws supported the notion of a public water system mandated to provide water for extinguishing fires, but not necessarily dedicated to assuring that clean water for household use and for drinking be made available to all residents.

Spurred by the yellow fever outbreak in 1798 that killed two thousand people in New York City, Dr. Joseph Browne, a private physician and an engineer, made the first proposal to bring pure water to Manhattan from outside the city. Although the Common Council did not accept Dr. Browne's proposal to build a dam on the Bronx River, it did submit a bill to the state legislature requesting authority to build the city's first waterworks. This bill became a new law. On March 30, 1799, the State Legislature passed "An Act to supply the City of New York with pure and wholesome water."[33] This law issued a charter to the private Manhattan Water Company granting it the exclusive right to bring water to the city from outside sources. If in ten years the company failed to supply enough water, the charter would expire.[34] The charter included a measure, introduced by Republican Aaron Burr, which permitted the company to use surplus capital in financial transactions consistent with state law. This was a pivotal moment when the city outsourced the acquisition of much needed new sources of water to a private company.

Following the passage of this act, the Manhattan Water Company began to develop a modest water system, while focusing most of its attention on the banking business, using the surplus capital generated by the water company. On September 1, 1799, the Company established a "house of discount and deposit," which became the Chase Manhattan Bank, at 40

[32] Hall, *Water for New York City,* 20-21.
[33] Galusha, *Liquid Assets,*15.
[34] Koeppel, *Water for Gotham*, 111.

Wall Street.[35] With regard to its waterworks, the company made no effort to import water from outside the city. Rather it began digging wells and building a reservoir in lower New York. The orginal plans for the reservoir stipulated that it house one million gallons of water. However, in 1800, in order to reduce costs, the company's board downsized the capacity to one hundred thousand gallons of water.[36] In 1801, the company built a reservoir on Chambers and Reade Street, near Centre Street.[37] The company obtained the water supply for this reservoir from a well located on Reade Street. A steam engine pumped the water to the reservoir.[38]

This reservoir is depicted in this 1825 lithograph (figure 1.4). Although a much

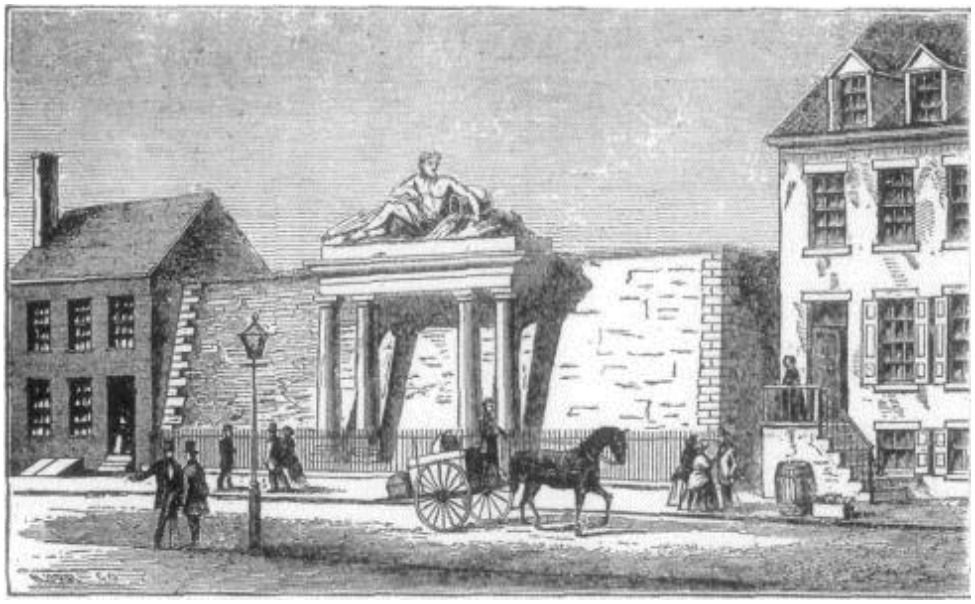

Figure 1.4: Reservoir of Manhattan water works. Chamber St., 1825. New York Public Library Digital Gallery, accessed February 12, 2011, http://digitalgallery.nypl.org/nypldigital/, Courtesy of The New York Public Library. www.nypl.org.

more modest version of what was originally planned, this reservoir was a visually arresting structure. As the lithograph shows, the reservoir's stone walls were vertical on the sides, but

[35] This bank became the first competition to Alexander Hamilton's Bank of New York and therefore may have contributed to the famous duel between Burr and Hamilton in 1804. See Galusha, *Liquid Assets*, 15.
[36] Koeppel, *Water for Gotham*, 97-99.
[37] "The Croton Danger," *New York Tribune*, March 27, 1872, 1.
[38] Kenneth Holcomb Dunshee, *As You Pass By* (New York: Hastings House Publishers,1952), 181.

sloped back in the front. The façade featured a portico and doric columns with the figure of the god Oceanus, the company's symbol, lounging majestically on top.[39] The ornate visual appearance of the structure contrasted with its lack of utility. This reservoir did not increase New York's water supply, as it did not bring in a new supply of water from the Bronx as the company had initially proposed to do. Rather, the company drew water from the Collect and other underground sources through wells and pumps to the reservoir tank and then distributed this water through wooden pipes to fourteen hundred houses.[40]

The Manhattan Company's water supply was limited and its delivery was unreliable and inconsistent. In 1809, one Federalist newspaper stated, "We know of no family which is regularly supplied with Manhattan water."[41] Nonetheless, Dewitt Clinton, who concurrently held the positions of mayor, state senator, director of and investor in the Manhattan Company, managed to extend the company's original charter.[42] With this extension, the company received an additional ten years to operate its water works and an additional thirty years as a corporation should the city purchase its waterworks. The charter granted the Manhattan Company far-reaching eminent domain rights over rivers and streams. Yet, the contract did not require the company to provide water for extinguishing fires nor was it required to repair streets after laying pipes. The contract allowed the company to set whatever water rates it thought appropriate throughout the city.[43]

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[39] Koeppel, *Water for Gotham: A History*, 97-99. Other sources claim the statue was made of bronze and depicted Aquarius, the water bearer. After 1842, when the reservoir was demolished, the statute was relocated to the company's banking offices on Wall Street and later lost. See Dunshee, *As You Pass By*, 181.
[40] "A Century Old Today: Centennial of the Bank of the Manhattan Company," *New York Tribune,* April 2, 1899, A2.
[41] Koeppel, *Water for Gotham: A History*, 113.
[42] Before General Incorporation Laws were in place, it was common practice for the legislature to grant charters to companies only if it met a public good.
[43] Koeppel, *Water for Gotham*, 82.

The Company's water quality was dubious at best. Official records reported the presence of foreign matter in every gallon of Manhattan Company water tested. Delivered through a system of wooden pipes made of bored out logs, the water accumulated impurities as it traveled to residences from the Chambers Street reservoir. Some New Yorkers made do with this water by adding brandy or gin to make it drinkable. Others turned to Knapp's Spring, near 14th Street, for their drinking water (figure 1.5). From this spring, customers received two gallons of water

Figure 1.5: Knapp's tea-water pump. Print published in 1887, but depicting an earlier scene. From Costello, Augustine, E. *Our firemen: a history of New York Fire Department* (New York: A. Costello, 1887). New York Public Library Digital Gallery, accessed December 15, 2011, http://digitalgallery.nypl.org/nypldigital/, Courtesy of The New York Public Library. www.nypl.org.

per day for twenty-five cents a week, delivered to their homes in red and white painted carts.[44] Some residents purchased soda water from local vendors. New York's signature seltzer water made from spring water became a popular drink in the 1820s. Yet, the lack of sufficient water supply remained a pressing issue.

To address this water shortage, the city began to build rooftop cisterns to collect rain water for fighting fires, placing two cisterns on top of City Hall in 1811. The city urged its churches to do the same. In 1817, the state legislature authorized the city to install public

[44] "The Croton Danger," *New York Tribune*, March 27, 1872, 1.

cisterns throughout the city using the same funding formula as it had for wells. Neighborhoods applying for public cisterns paid six hundred dollars toward their construction.[45] By 1824, it was becoming clear that the private Manhattan Water Company, which had again extended its charter, was not meeting its obligation to provide New York City's water. However, instead of committing itself to taking over management of the water supply, the city chose to outsource this effort to another private company, the New York Water-Works, headed by John Griscom.[46] Griscom, a well-known reformer, educator, and chemist, sought to provide New York City with good water. His New York Water-Works would distribute water through metal pipes, rather than the wooden variety used by the Manhattan Company. The Common Council at first opposed the creation of this new company, but in 1825, it approved its six-year charter, which was capitalized at two million dollars.[47] Unlike the Manhattan Company's contract, this charter included no rights of eminent domain and named no potential source outside the city from which water would be drawn. Subscribers bought stock certificates at the Franklin Bank and work was set to begin. However, a few months later, the Franklin Bank failed due to an unrelated scandal. In 1825, the private New York Water-Works rose and fell. It never delivered any water.[48]

That same year, a major success in public works took center stage. In 1825, the Erie Canal opened. Begun in 1816 and paid for mainly by New York State, the Erie Canal was an ambitious project both in terms of technology and finances. By lowering the expense of

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[45] See Koeppel, *Water for Gotham*, 121-124, for a brief history of seltzer. See also Charles Herman Sulz, *A Treatise On Beverages Or The Complete Practical Bottler; Full instructions for laboratory work with original practical recipes for all kinds of carbonated drinks, mineral waters, flavorings extracts, syrups, etc.* (New York: Dick & Fitzgerald Publishers, 1888), 583 for formulas of how to make seltzer. Seltzer is made by adding sodium carbonate, sodium chloride, and sodium sulphate to water.

[46] This private company, The New York Water-Works is not to be confused with the similarly titled proposed public entity of Christopher Colles in 1774, The New-York Waterworks.

[47] Two million dollars in 1825 is worth $45,500,000 from 2010 using the Consumer Price Index, which estimates amount we would need to purchase it today. Measuring Worth.com, accessed June 30, 2011, http://www.measuringworth.com/.

[48] Koeppel, *Water for Gotham: A History*, 130-132.

transporting goods, boosting inland trade, and enhancing the prominence of New York City, the canal proved to be the largest and most successful infrastructure project at this time.[49] Perhaps inspired by this major accomplishment in infrastructure, but also driven by the fact that the Manhattan Company's contract did not require it to provide water for fighting fires, the city stepped forward. In 1830, the city, at its own expense, began building an iron water tank at 13th Street and Bowery to hold 305,422 gallons of water for fire protection.[50] Filled from a local well, the water in this reservoir was then distributed through cast iron pipes.[51] An engraving published in 1832 (figure 1.6), depicts what the first city-built reservoir would look like. The foreground of the image includes a person pumping water from a source most likely other than the 13th Street Reservoir, since the water in this tank was not for household use. Completed in 1833, this reservoir did not even begin to solve the city's water problem.

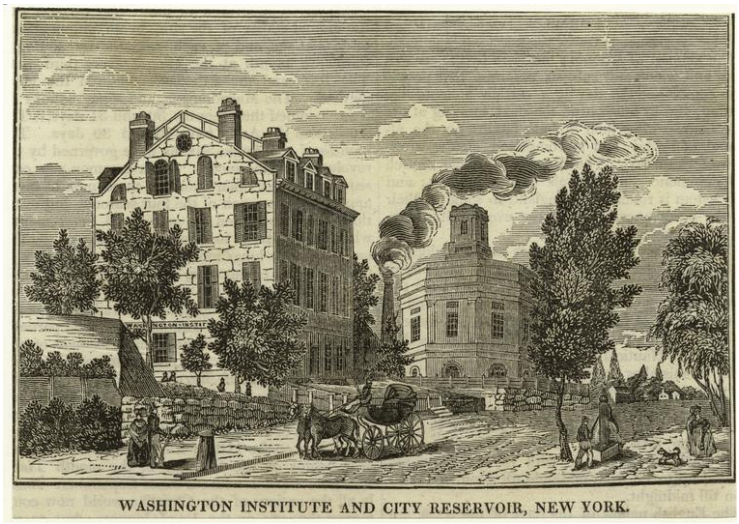

Figure 1.6: Washington Institute and City Reservoir, New York, 1882. New York Public Library Digital Gallery, accessed March 6, 2011. http://digitalgallery.nypl.org/nypldigital/ Courtesy of The New York Public Library. www.nypl.org

[49] Popper, "Poor Christopher Colles: An Innovator's Obstacles in Early America," 178-190. Lisa Keller, *Triumph of Order: Democracy and Public Space in New York and London* (New York: Columbia University Press, 2008).
[50] George William Sheldon, *The Story of the Volunteer Fire Department of the City of New York* (New York: Harper, 1882)
[51] History of New York's Water Supply System. New York City Government Website, accessed August 29, 2011, http://www.nyc.gov/html/dep/html/drinking_water/history.shtml.

By the spring of 1830, the Manhattan Company, although officially still in operation, was in full violation of its contract. The company had not provided sufficient quantity of water. Because the water that the Manhattan Company did provide was of low quality, citizens continued to rely on local public wells and on expensive water from private springs. City official realized that to remedy the situation, they would need to seek Albany's assistance to restrict the company's water rights.[52] This time, instead of allocating oversight of water supply to another private company, the city government slowly began to take control of water.

The outbreak of cholera forced the city to further explore the development of a municipal water system. In June of 1832, the *New York Evening Post* reported that Asiatic cholera had spread from Europe. Cases of the disease were recorded in Vermont and New York State. By July 4, the cholera epidemic had struck New York City, hitting its peak on July 21,1832, when one hundred and four people died in one day.[53] "To see individuals well in the morning and buried before night, retiring apparently well and dead in the morning, is something which is appalling to the boldest heart," a young man wrote in his diary in 1832.[54]

The cause of cholera was unknown. Because New York's poor neighborhoods, such as the Five Points neighborhood located in the Sixth Ward near Mulberry Street, were the hardest hit by the disease, moralists insisted that the bad habits of the poor had brought about the cholera epidemic. In 1832, doctors thought that bad air spread disease and that smell indicated the presence of illness.[55] Medical professionals lobbied the city to clean the streets, which were polluted by animal waste and sewage, with the belief that cleaner streets would mean cleaner air.

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[52] Koeppel, *Water for Gotham*, 140.
[53] Nelson Blake, *Water for the Cities: A History of the Urban Water Supply Problem in the United States* (Syracuse: Syracuse University Press, 1956), 131-132.
[54] Charles E. Rosenberg. *The Cholera Years, the US in 1832, 1849, and 1866*. (Chicago: University of Chicago Press, 1962), 3.
[55] It was not until 1854 that medical research of Dr. John Snow demonstrated that cholera cases were traceable to one particular water pump, located on London's Broad Street, which had been contaminated by human waste. See Blake, *Water for the Cities*, 131-132

The city complied. By July 1832, the *New York Evening Post* reported that the city's street cleaning measures and its efforts to "disinfect places which are ordinarily the receptacles of corrupt air" had been so effective that city-dwellers might doubt their sense of smell, and ask themselves "if this is really New York, and if the pure breezes which he breathes, really belong to that atmosphere which formerly in the summertime was so offensive."[56] Proponents of the miasma theory insisted that the city supply more water in order to keep its streets and thus, its air supply, clean.[57]

After the cholera epidemic of 1832, the Aldermen of New York City's Common Council began to look to Philadelphia where there had been little incidence of cholera. Upon comparing the two cities, they concluded that Philadelphia possessed "an abundance of pure and wholesome water, not only for drinking and culinary purposes, but for bathing and for washing the streets of the whole city."[58] Conversely, New York had no such abundance of water. Again, these Aldermen believed smell indicated disease. They argued that in Philadelphia, water had swept away odor and thus, cholera. However, in New York, odor and illness persisted. "A person coming into the city from the pure air of the country, is compelled to hold his breath, or make use of some perfume to break off the disagreeable smell arising from the streets."[59] Ultimately, any effort to clean the air was, in this instance, a futile undertaking, since cholera was a water-borne disease. Cleaning the streets would remain a key platform of urban sanitation and street cleaning required an ample supply of water.

Motivated to act by the report about Philadelphia, the Fire and Water Committee of the Common Council ordered Colonel Dewitt Clinton, Jr. to conduct an investigation of the possible

[56] Blake, *Water for the Cities*, 131.
[57] Blake, *Water for the Cities*, 132.
[58] Blake, *Water for the Cities*, 140.
[59] Blake, *Water for the Cities*, 140.

external water sources for New York City. Clinton recommended the Croton River as the source of choice. In 1833, the Common Council requested that the state legislature arrange for Governor William Marcy to appoint a water commission to further examine the Croton River plan. In an act that foreshadowed more organized governmental action later in the century, Governor Marcy, with the consent of the legislature, named a five-member water commission on February 26.[60] However, this act never came to fruition. One year passed and the act granting the commissioners' appointments expired.

On February 6, 1834, in preparation for the construction of the new waterworks, the Common Council appealed to the State Legislature for a law that would permit them to borrow two and a half million dollars at five percent interest to be called "The Water Stock of the City of New York." Since the 1833 act had expired, the State Legislature passed a new act on May 2, 1834, called "An Act to Provide for Supplying the City of New York with Pure and Wholesome Water." This act called for a popular vote to approve the Common Council's borrowing of funds for the project.[61] On April 14, 15, and 16, 1835, the people of New York voted to endorse the building of city's first waterworks to draw on the Croton River.[62] The yes votes totaled 17,330 and the no votes totaled 5,963, divided by ward.[63] The oldest and richest wards voted for Croton water and the poorest wards narrowly opposed it.[64] In short, the wards that paid the most in taxes voted in large numbers for Croton.[65] With the legislation in place and with the majority of the popular vote in support of the Croton waterworks, "all that remains is action," suggested a

[60] Galusha, *Liquid Assets*, 15.
[61] Charles A. King, *A Memoir of the Construction, Cost, and Capacity of the Croton Aqueduct…Together with an Account of the Civic Celebration, (New York: Charles King), 1843*, 120-121.
[62] Koeppel, *Water for Gotham*, 170-172.
[63] King, *A Memoir*, 138.
[64] Koeppel, *Water for Gotham*, 170-172.
[65] King, *A Memoir*, 139.

journalist for *The New-York Journal of Commerce*."[66] The arrival of water from Croton was much anticipated. "The streets. They are as dirty as possible and ought to be cleaned without delay. Oh! for the time when the Croton shall bathe them with its pure and crystal waters," proclaimed *The New-York Mirror*.[67]

Despite the questionable status of the street cleanliness, by 1835, real estate prices in New York had tripled and New York had positioned itself as a dominant force in business and finance.[68] However, at the end of 1835, flames engulfed lower New York, adding further urgency to the water question. What became known as the Great Fire broke out at 9 p.m. on December 16 and the flames raged until 4 p.m. on December 17.[69] Never before had fire caused such far-reaching destruction of property and loss of life in the city. [70] Six hundred and seventy-five buildings located on Merchant, Pearl, Water, Front, South, Williams, and Wall Streets burnt to the ground.[71] "Had there been reservoirs of water, as it had been proposed to construct for some time past," one journalist posited, "the progress of the fire would probably been arrested at an early hour after it began."[72] With such large-scale destruction, business elites worried that the cost of the destroyed buildings would exhaust the funds of insurance companies, thereby threatening the burgeoning insurance industry.[73] The Common Council, whose members included directors of insurance companies, further pressured the water commissioners to begin the construction of a publicly-managed water system, now called the Old Croton Reservoir and

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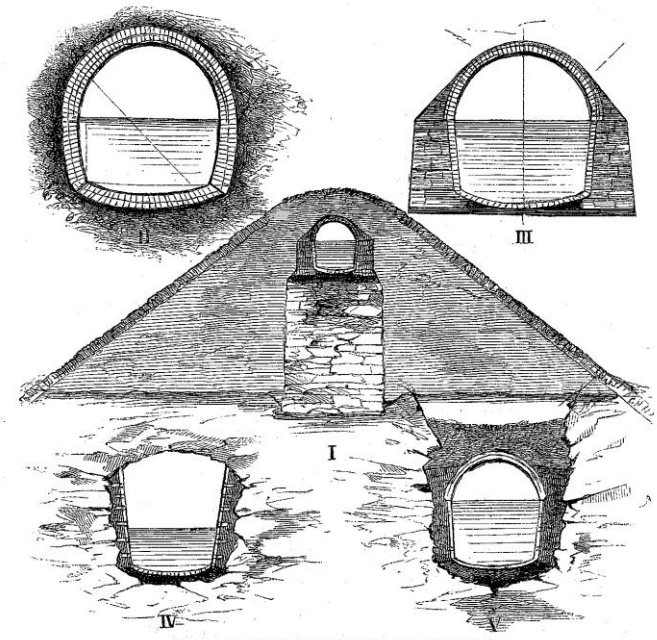
[66] *Connecticut Courant,* April 20, 1835.
[67] *The New-York Mirror: A Weekly Gazette of Literature and the Fine Arts,* May 23, 1835; 12: 14.
[68] Lisa Keller. *Triumph of Order: Democracy and Public Space in New York and London (*New York: Columbia University Press, 2008), 40.
[69] "Great Fire in New York, December 16 &17:" *The American Magazine of Useful and Entertaining Knowledge*, January 1, 1836: 2,5.
[70] Galusha, *Liquid Assets*, 15.
[71] "Frightful Conflagration!" *Christian Watchman*, December 25, 1835; 16, 52.
[72] "Great Fire in New York, December 16 &17:" *The American Magazine of Useful and Entertaining Knowledge*, January 1, 1836:2,5.
[73] "Frightful Conflagration!" *Christian Watchman*, December 25, 1835; 16, 52. Stanley Greenberg, *Waterworks: A Photographic Journey through New York's Hidden Water System* (New York: Princeton Architectural Press, 2003), 10.

Aqueduct, under the supervision of Chief Engineer David Douglass.[74] Douglass produced an initial map of the pathway for the new aqueduct and an appraisal of the land to be acquired by the city in order to build it. In 1836, the water commissioners fired Douglass due to internal issues and placed Engineer John B. Jervis, who had worked on the Erie Canal, at the helm.[75] Engineers Horatio Allen and Fayette B. Tower joined the project.[76] Construction of the Croton Aqueduct began in 1837.[77]

The Croton system consisted of a dam on the Croton River, three reservoirs, and one closed aqueduct to connect them. Built just below ground level and covered with earth, the aqueduct spanned 41.5 miles to transport water by gravity from the watershed to the city.[78] All the work of building the aqueduct was done by hand with a shovel. Figure 1.7 shows a cross-section of the aqueduct tunnel.



SECTIONS OF THE AQUEDUCT, SHOWING ITS CONSTRUCTION.

[74] Galusha, *Liquid Assets*, 17.
[75] Galusha, *Liquid Assets,* 21.
[76] Koeppel, *Water for Gotham,* 204.
[77] Galusha, *Liquid Assets*, 15.
[78] Galusha, *Liquid Assets,* 21.

Figure 1.7: Sections of the aqueduct, showing its construction: 1860: Figures numbered I-V. Printed on border: "I. Embankments across valley. ; II. Masonry in earth excavations ; III. Tunnel cutting earth. ; IV. Tunnel cutting in rock. ; V. Open cutting in rock," New York Public Library Digital Gallery, accessed December 6, 2011. http://digitalgallery.nypl.org/nypldigital/ Courtesy of The New York Public Library. www.nypl.org

During the planning stage, there was much discussion about how best to cross the Harlem River. Douglass, Jervis' predecessor, had advocated for a high bridge to carry the water across the river. Jervis suggested a low bridge, arguing that there was little navigation on the river. The water commissioners agreed to Jervis's solution because it would be easier, faster and cheaper to build. Yet, opponents of this plan complained that a low bridge would negatively impact the local scenery. City council members and local property-owners argued that a high bridge was more suited to the site and they lobbied the State legislature for their cause.[79] In May of 1839, the State legislature passed a law mandating that either a tunnel or a high-level bridge be constructed at the site thereby overruling the earlier decision of the water commissioners. Since Jervis was opposed to the idea of a tunnel under the river due to his concerns about leakage at the bottom of the tunnel caused by the high water pressure, he began planning the construction of what came to be called the High Bridge.[80] Jervis' etching (figure 1.8) of the proposed structure for the Croton aqueduct served to promote the High Bridge idea to various constituencies during the planning process.

[79] Galusha, *Liquid Assets,* 25-26.
[80] *The Old Croton Aqueduct: Rural Resources Meet Urban Needs* (New York: The Hudson River Museum of Westchester, 1992), 53, 31.

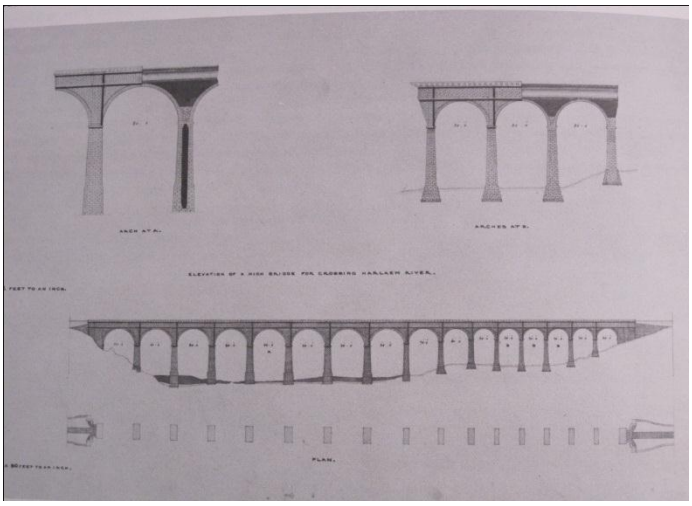


Figure 1.8: High Bridge, drawing by John Jervis. *The Old Croton Aqueduct : Rural Resources Meet Urban Needs* (New York: The Hudson River Museum of Westchester, 1992), 30.

The High Bridge was an extremely ambitious feat of engineering.[81] Its fifteen arches supported a bridge of fourteen hundred and fifty feet. Across the bridge and just under its surface, two thirty-six inch cast iron pipes carried approximately thirty-six million gallons of water per day to New York.[82] Writing in 1848, the year the High Bridge was completed, Fayette B. Tower predicted that the High Bridge would "stand as a monument to the genius of enterprise of the age."[83] This 1849 lithograph by Nathaniel Currier (figure 1.9) shows the majestic High Bridge as an integrated part of the pastoral landscape. The High Bridge made the role of the aqueduct in transporting water from the Croton watershed to the city visible. With its dramatic arches and graceful span across the river, the High Bridge and environs became a popular daytrip for urbanites seeking respite from the bustle of the city.

[81] *The Old Croton Aqueduct*, 31
[82] Galusha, *Liquid Assets*, 26.
[83] *The Old Croton Aqueduct*,15

Figure 1.9: The High Bridge at Harlem, N.Y. Nathaniel Currier, 1849, New York Public Library Digital Gallery, accessed March 29, 2011, http://digitalgallery.nypl.org, Courtesy of The New York Public Library. www.nypl.org.

After crossing the High Bridge, water from Croton went back underground. At the Manhattan Valley, the water was put under pressure by using an inverted siphon. A pipeline that carries water under streams or other depressions in the ground is called an inverted siphon in civil engineering. The water inside an inverted siphon fills the pipe entirely so that it flows under pressure, rather than flowing by gravity.[84] The water continued its journey through Manhattan along Amsterdam Avenue and then through iron pipes to the Yorkville Receiving Reservoir, a rectangular tank located between Seventy-Ninth Street and Eighty-Sixth Street between Sixth and Seventh Avenues, where the present-day Great Lawn of Central Park stands.

[84] Stanley Greenberg, *Waterworks: A Photographic Journey through New York's Hidden Water System* (New York: Princeton Architectural Press, 2003), 11. A siphon is a tube in the shape of an inverted U which allows liquid to flow uphill from one container and then down via gravity to a lower container. An inverted siphon is not a siphon per se. "siphon," Oxford English Dictionary, accessed August 30, 2011, http://www.oed.com. "inverted siphon,"*Encyclopædia Britannica*, accessed August 30, 2011, http://www.britannica.com/EBchecked/topic/1766636/inverted-siphon

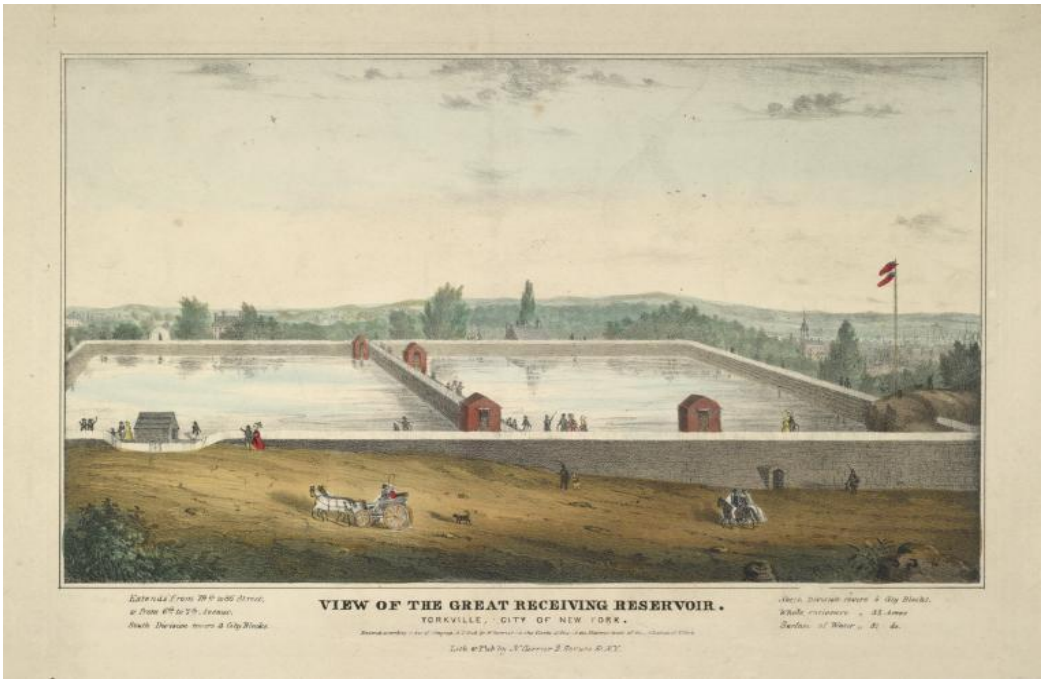


Figure 1.10: View of the Great Receiving Reservoir. Yorkville. City of New York, Nathaniel Currier, 1842. New York Public Library Digital Gallery, accessed April 21, 2012, http://digitalgallery.nypl.org/nypldigital/, Courtesy of The New York Public Library. www.nypl.org.

From the Yorkville Reservoir, the water made its way through underground pipes to the distributing reservoir at Fifth Avenue and 42nd Street, also called the Murray Hill Reservoir, completed in June 1842. The Murray Hill reservoir was a four-acre man-made lake encased by granite walls that were fifty feet high and twenty-five feet thick. The reservoir was designed to be visited by the general public. Public walkways along the top of the reservoir's walls allowed pedestrians to view the reservoir's water supply and its surrounding landscape with the built-city in the far distance. A hand-colored lithograph (figure 1.11) depicts the visually dramatic distributing reservoir in 1842 with visitors strolling along the promenades.

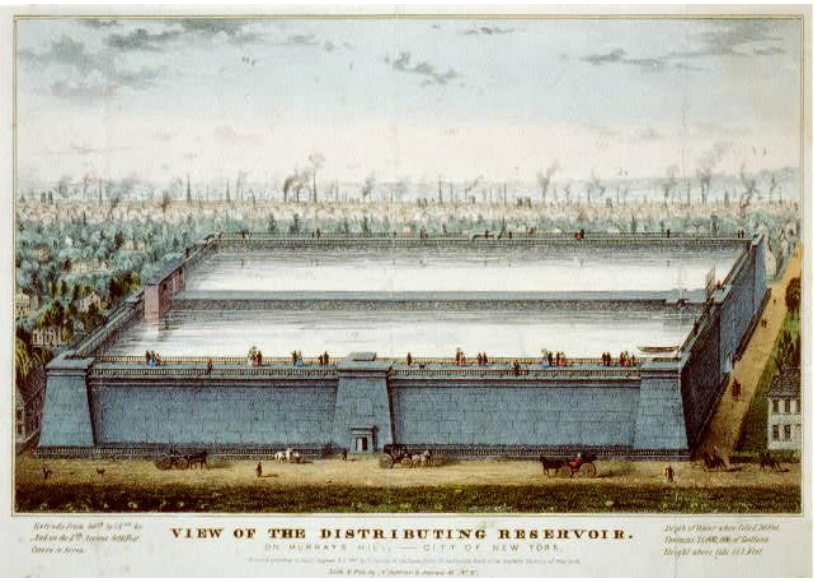


Figure 1.11: View of the distributing reservoir: on Murray Hill,--City of New York, Published by N. Currier, c1842. Library of Congress, accessed December 15, 2011, http://www.loc.gov/pictures/item/2002698130/.

While this reservoir was in use, it became a popular destination. Locals and tourists alike came to view this marvel of engineering with its bold, Egyptian architectural style. Writing for *The Columbia Spy* on May 27, 1844, Edgar Allen Poe recommended the site as a must-see. "When you visit Gotham," Poe wrote, "you should ride out the Fifth Avenue, as far as the distributing reservoir, near forty-third street, I believe. The prospect from the walk around the reservoir is particularly beautiful. You can see, from this elevation, the north reservoir at Yorkville; the whole city to the Battery; with a large portion of the harbor, and long reaches of the Hudson and the East Rivers."[85]

The public Croton system opened officially on July 4, 1842 to much fanfare and press coverage.[86]

[85] *The Columbia Spy,* The Edgar Allen Poe Digital Collection at the Harry Ranson Center of the University of Texas at Austin, accessed June 10, 2012, http://norman.hrc.utexas.edu/poeDC/

[86]Most of system was operational by 1844, with temporary piping transporting the water over the Harlem River until the High Bridge was completed in 1848. See Galusha, *Liquid Assets*, 21.

> Yesterday was a great day for our City – more to be sure for what it promised than for what was performed. The Croton Aqueduct – one of the most stupendous structures of modern times – for the first time opened its gates and gave us visible evidence of the infinite good it is destined to confer upon the city.[87]

This was the *New York Tribune's* description of a remarkable public event held June 27, 1842 at the Yorkville Receiving Reservoir. "Omnibuses, cabs, and carriages of all shapes and dimensions thronged every thorough fare, and thousands unable to obtain conveyances of any sort crowded the way on foot," *The Tribune* continued.[88] At 4:30 p.m. that afternoon in front of a crowd of thousands, workers raised the gate at the west end of the Northern Division of the reservoir and in flowed the much-awaited Croton water for all to see. A thirty-eight gun salute followed.

Next, a boat, *The Croton Maid of Croton Lake,* which had traveled through the aqueduct descended into the reservoir. *The Croton Maid* had launched initially some thirty-eight miles away at the Croton Reservoir and it had traveled through the aqueduct to the High Bridge. Then, the boat had been transported across the Harlem River and deposited into the aqueduct yet again where it continued its journey to the Yorkville Receiving Reservoir in Central Park.[89] Lawyer Samuel Stevens formally presented this boat as a gift from the Chief Engineer to the Fire Department of New York. In his remarks, he explained that this boat was "emblematic of the capacity of the Aqueduct to introduce an abundant supply of water for the great object of your organization – the extinguishment of fires."[90] Stevens went on to describe the unique features of *The Croton Maid,* explaining that it had been designed "to go *underground,* and her voyage,

[87] "Opening of the Croton Aqueduct," *New York Tribune,* June 28, 1842, 2.
[88] "Opening of the Croton Aqueduct," *New York Tribune,* June 28, 1842, 2.
[89] Edward H. Hall, *Water for New York City* (New York: Hope Farm Press, 1917), 61.
[90] "Opening of the Croton Aqueduct," *New York Tribune,* June 28, 1842, 2.

therefore, different from all other voyages *under the sun*."[91] He closed his remarks by inviting the crowd assembled to the July 4 event at the Distributing Reservoir at Fortieth Street and Fifth Avenue, where he would "furnish them with a beverage best suited for firemen to celebrate the day of their Independence."[92] This beverage would be none other than Croton water.

At sunrise on July 4, 1842, Croton water arrived at the Murray Hill distributing reservoir. A forty-five cannon salute marked the water's arrival as it slowly rose within the two basins of the reservoir. Attendance was sparse at this hour, but Fayette B. Tower was present and he recorded his experience of how he 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." By sunset of July 4, over twenty-five thousand citizens had visited the reservoir, where, as promised, they sampled a glass of Croton water served over ice.[93]

On July 12, Philip Hone, diarist and New York's mayor from 1826-1827, visited the Yorkville Reservoir with his wife. Of this visit Hone wrote: "There were a great number of visitors at this place – pedestrians, horsemen, railroad travelers, and those who, like myself, came in their own carriages…for it has become a fashionable place of resort and well it may for it is well worth seeing."[94] Hone and his wife also sampled Croton water. Hone wrote in his diary that "the clear, sweet, soft water (clear it is, and sweet and soft, for to be in the fashion, I drank a tumbler of it and found it all of these) is flowing in copiously, and has already formed two pretty, limpid, placid, Mediterranean seas, of wholesome temperance beverage, well

[91] "Opening of the Croton Aqueduct," *New York Tribune*, June 28, 1842, 2.
[92] "Opening of the Croton Aqueduct," New York Tribune, June 28, 1842, 2.
[93] Gerard T. Koeppel, *Water for Gotham: A History*. Princeton: Princeton University Press, 2000, 275-276
[94] Diary of Philip Hone, 137.

calculated to cool the palates and quench the thirst of the New Yorkers, and to diminish the losses of the fire-insurance companies."[95]

On October 14, 1842, a citywide celebration with parades, fireworks, and opulent water fountains marked the arrival of the first water from Croton.[96] The parade was "a splendid affair…and every fireman taxed himself twenty-five cents to pay for it."[97] Honored guests invited to the celebration included President Tyler, and ex-Presidents John Quincy Adams and Martin Van Buren, although none of these invitees attended the event.[98] Among the parade participants were the Governor, the Lieutenant Governor, the Mayor, members of the Common Council of New York, officers of the army and the navy, judges, clergymen, scientists, and militiamen.[99]

The grand parade marched to City Hall, where spectators could witness a glorious water fountain, which "threw a jet of water fifty feet into the air."[100] The presidents of the State Water Commissioners and the Croton Aqueduct Board each addressed the crowd.[101] At the culmination of the parade, attendees listened to a performance of "The Croton Ode," written by George P. Morris, with the following lyrics:

Gushing from this living fountain.
Music pours a falling stream,
As the Goddess of the Mountain,
Comes with all the sparkling train…
Eden's arch of promise bending
over her translucent brow…
Let intemperance greet her too,
And the heat of his delusion
Sprinkle with this mountain-dew.
Water leaps as is delighted,

[95] Philip Hone, *The Diary of Philip Hone, 1828-1851.* New York: Dodd, Mead, & Company, 1910, 137.
[96] Galusha, *Liquid Assets*, 30.
[97] Sheldon, *The story of the volunteer fire department of the city of New York.*
[98] I.N. Phelps Stokes, *The Iconography of Manhattan Island*, 638-639.
[99] Edward Wegmann, *The Water Supply of New York, 1658-1895* (New York: J. Wiley & Sons, 1896), 46.
[100] I.N. Phelps Stokes, *The Iconography of Manhattan Island*, 638-639.
[101] I.N. Phelps Stokes, *The Iconography of Manhattan Island*, 638-639.

While her conquered foes retire!
Pale Contagion flies affrighted
with the baffled demon Fire…[102]

Natural fountains represented life and salvation in the ancient world and this image of a fountain appears in the opening lines of the Croton Ode.[103] The lyrics speak of eliminating fire, drunkenness, and disease with this new source of pure water. Another piece of music, the Croton Jubilee Quick Step composed by Lewis H. von Vultee, celebrated the arrival of Croton water. A dramatic water fountain graced the program cover (figure 1.12), emphasizing the copious amounts of water available to the city with the Croton system in operation.

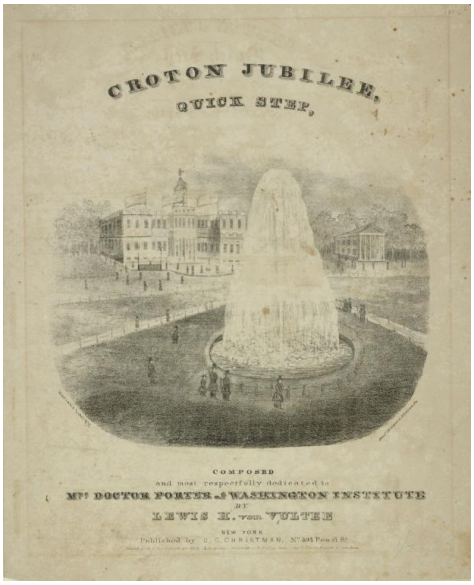


Figure 1.12: View of New York City Hall, with fountain playing in foreground. Croton Jubilee Quick Step, 1842, New York Public Library Digital Gallery, accessed March 6, 2011,http://digitalgallery.nypl.org Courtesy of The New York Public Library. www.nypl.org

Here, the fountain was a symbol of bounty and of civic pride, as if to say –look, there is plenty of water now…we can show it off and it is beautiful…the city, not the ineffectual private Manhattan Company, has provided this water for you.

[102] *The Old Croton Aqueduct*, 50. See also *The Evening Post*, NY, October 15, 1842 and Charles King, A Memoir of the Construction, Cost, and Capacity of the Croton Aqueduct…together with an account of the Civic Celebration (New York: printed by Charles King, 1843.)
[103] *The Old Croton Aqueduct*, 50.

The volume of water provided by the Croton system made ornamental public fountains, like this one pictured on the program, possible.[104] Silk ribbons bearing the Croton Ode lyrics and badges relaying the history of the aqueduct were available to event attendees (figure 1.13).[105] A silver medal featuring the distributing reservoir and a cross-section of the aqueduct was struck in honor of the day (figures 1.14 and 1.15).[106]

Figure 1.13: 1840s Commemorative Silk Ribbons, Live Auctioneers, accessed August 16, 2011, http://www.liveauctioneers.com/item/289772

Figure 1.14: 1842 Croton Aqueduct Completion Medals, Lovett Tokens and Medals, accessed August 16, 2011 http://lovetttokensmedals.com/RobertSr/CrotonAqueduct.html See also Wegmann, *The Water Supply of New York*, 47.

[104] *The Old Croton Aqueduct: Rural Resources Meet Urban Needs*, (New York: The Hudson River Museum of Westchester, 1992).
[105] *The Old Croton Aqueduct*, 56.
[106] Wegmann, Edward, *The Water-Supply of the City of New York* (New York: J. Wiley & Sons, 1896), 46-47.

Figure 1.15: Croton Aqueduct Completion Medals, Lovett Tokens and Medals, accessed August 16, 2011 http://lovetttokensmedals.com/RobertSr/CrotonAqueduct.html

In addition to music and material goods, at the bidding of the Common Council, Charles King penned a memoir of the day, which was published in 1843.[107] This image of the fountain at City Hall Park (figure 1.16) shows the jubilant festivities that marked the start of the publicly-managed Croton water system.

Figure 1.16: Croton Water Celebration, 1842: Atwill, New York Public Library Digital Gallery, accessed March 6, 2011, http://digitalgallery.nypl.org/nypldigital/, Courtesy of The New York Public Library. www.nypl.org.

Charles King, in his memoir, described tasting Croton water at the October 14 celebration. After the parade, spectators entered City Hall to find tables with glasses of Croton water, several

[107] See Charles King, *A Memoir of the Construction, Cost, and Capacity of the Croton Aqueduct…together with an account of the Civic Celebration* (New York: Printed by C. King, 1843). Wegmann, *The Water Supply of New York*, 46-47.

hundred citizens "partook of a cold collation, and Croton water and lemonade, but no wine or spirituous liquors."[108] Water was presented as a beverage and sampled at each of the three celebrations of Croton water.

Not everyone was a fan of Croton water. Lawyer and diarist, George Templeton Strong complained that the water would be full of "tadpoles and animalculae." [109] He also feared that while constructing the aqueduct, "Hibernian vagabonds" had relieved themselves into it.[110] About the arrival of Croton water, Philip Hone wrote:

> October 12, 1842. — Nothing is talked of or thought of in New York but Croton Water; fountains, aqueducts, hydrants, and hose attract our attention and impede our progress through the streets. Political spouting has given place to water-spouts, and the free current of water has diverted the attention of the people from the vexed questions of the confused state of the national currency. It is astonishing how popular the introduction of water is among all classes of our citizens, and how cheerfully they acquiesce in the enormous expense which will burden them and their posterity with taxes to the latest generation. Water! Water! is the universal note which is sounded through every part of the city, and infuses joy and exultation into the masses, even though they are out of spirits.[111]

This diary entry of Philip Hone captures the importance of the arrival of Croton water. Hone's words also illustrate his somewhat crotchety attitude about the "masses" and how they seem drunk on water to the point of ignoring larger issues, such as "the confused state of the national currency." Hone's disapproval suggests that city elites were ambivalent about the benefit of expanding city services and the large expenses these projects incurred. Despite these naysayers,

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[108] Charles King, *A Memoir of the Construction, Cost, and Capacity of the Croton Aqueduct…Together with an Account of the Civic Celebration.* New York: printed by Charles King, 1843, 300-301.
[109] Gandy, *Concrete and Clay,* 35.
[110] Gandy, *Concrete and Clay,* 35.
[111] *The Diary of Philip Hone,* 1828-1851, (New York: Dodd, Mead, & Company), Archive.org, accessed September 14, 2011, www.archive.org/details/diaryofphiliphon00home.

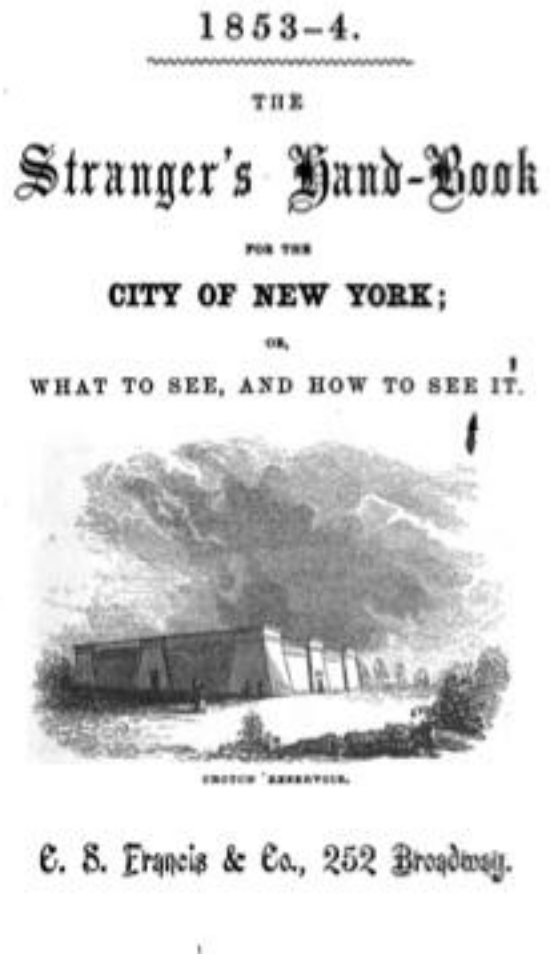
the arrival of Croton water served as a powerful demonstration of emerging technology and companies were quick to capitalize on this resonating symbol of the water fountain.

In connection with the three public ceremonies that welcomed Croton water on June 27, July 4, and October 14, 1842, the city also sponsored decorative water fountains to mark the achievement of bringing Croton water to New York in 1842. These fountains made Croton water visible and served as public signage to advertise the city's new water system and its abundant supply of fresh water. Such water fountains were part of a larger and international trend of the increased visibility of water and its more pronounced presence in public space.[112] Public ceremony and grand occasions filling urban space became a frequent trope throughout the nineteenth century, as did the planning and construction of visually arresting buildings, parks, and monuments. Water became part of this tradition.

After 1842, water was becoming more of a commodity for consumption, but accessibility of water to all residents remained uneven. The transient festivals would fade, but sites of water infrastructure would emerge as a more permanent commemoration of Croton water. The intentional visibility of the City of New York's early waterworks, such as the Murray Hill Reservoir and the High Bridge, made people aware of this public water system and aided in garnering support for it. Viewing and interacting with city-built infrastructure served to reinforce the publicity of water in the minds of New Yorkers and city officials alike.

The allure of visiting and seeing water infrastructure continued after the celebrations of 1842. The 1854 travel guide, *The Stranger's Handbook for the City of New York*, highlighted the Murray Hill reservoir as a top destination and even featured an image of it on its title page (figure 1.17). The rest of the guide contained churches and famous buildings, but the Murray

[112] Historian Jean- Pierre Goubert discusses the nineteenth century increased presence of fountains and washhouses and in the public space in nineteenth century France. He explores the utilitarian and aesthetic natures of fountains and their symbolic as well as sacred aspect. See Goubert. *The Conquest of Water,* 69-80.


1853–4.

THE

Stranger's Hand-Book

FOR THE

CITY OF NEW YORK;

OR,

WHAT TO SEE, AND HOW TO SEE IT.

CROTON RESERVOIR.

C. S. Francis & Co., 252 Broadway.

Figure 1.17: Title page, *The Stranger's Handbook for the City of New York or What to See and How to See it,* (New York: E.S. Francis & Company), 1854, 52.

Hill Reservoir, here called the Croton Aqueduct, is listed first in the section "Miscellaneous Places Worth Visiting." The text reads: "It is of the Egyptian style of architecture, and presents a very imposing appearance….An iron railing encloses the walk or promenade which is formed on the top of the walls." [113] With its prominent, well-visited infrastructure and its ample supply of

[113] *The Stranger's Handbook for the City of New York or What to See and How to See it,* (New York: E.S. Francis & Company), 1854, 52.

this new beverage, the Croton system had great meaning and symbolism for the city and its residents. The branding of the water from the Croton watershed as "Croton water" linked the distant source of the water, so its name reminded consumers of the many miles it had traveled to arrive in the city. Croton water appeared on water supply manhole covers along with the initial DPW for the Department of Public Works, at the center. Figure 1.18 shows a modern-day

Figure 1.18: Photograph of Department of Public Works manhole cover replica from public park along pathway of Old Croton Aqueduct, Bronx, New York, October 16, 2010, photograph taken by the author.

replica of these manhole covers. In 1856, the name Croton Park was proposed for what became Central Park. "The Croton is our pride and boast; it is a name full of bright and refreshing associations for all New Yorkers; it is musical and distinctive, and it would both give and receive new beauty by being associated with our great Park," *The New York Times* posited on February 8, 1856.[114] The name of Croton Park did not take, but this effort to title Central Park after the city's public water source shows the centrality of water, the importance of the increased supply brought in by Croton system, and the symbolic resonance of Croton water and what it represented. This advertisement from 1845-1850 (figure 1.19) celebrates the bounty and spectacle of Croton water with the decorative fountain as a centerpiece while educating its audience on the new technology of plumbing fixtures.

[114] "A Name for our New Park," *New York Times*, February 8, 1856, 4.

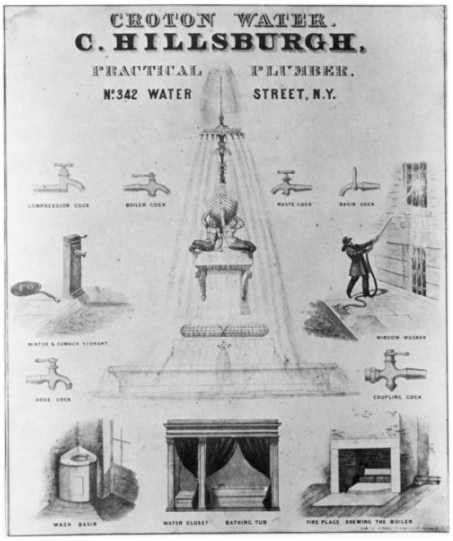
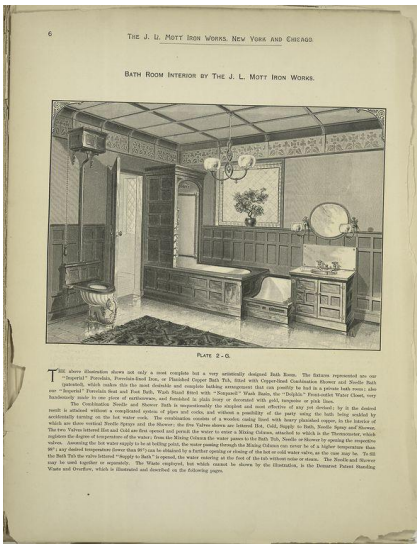


Figure 1.19: Croton Water, C. Hillsburgh, Practical Plumber in May N. Stone, "The Plumbing Paradox: American Attitudes toward Late Nineteenth-Century Domestic Sanitary Arrangements," *Winterthur Portfolio,* 14, (1979): 287.

An unintended side effect of the grandeur of public water and decorative water fountains was a belief in the abundance of water which led to patterns of water waste. In the 1850s and 1860s, residents used and wasted more water than ever before. The city began installing water meters in 1852, but this process was not complete until after 1878. This unevenly implemented and unreliable meter system encouraged consumers to waste water. Citizens routinely left fire hydrants open and ran indoor faucets continually to prevent pipes from freezing in the winter months, ignoring the Croton Aqueduct Board's pleas for conservation. In the 1860s and 1870s, water became an essential commodity for the middle class as they revamped their household plumbing and installed new water closets in their homes that drew on Croton water.[115] While indoor plumbing gained a new prominence after Croton, in the nineteenth century, a public water source and indoor plumbing were two distinct entities. Until the 1840s, expensive homes often had privies in their back yards, sometimes connected with the houses by decorated wooded

[115] May N. Stone," The Plumbing Paradox: American Attitudes toward Late Nineteenth-Century Domestic Sanitary Arrangements." *Winterthur Portfolio*, 14, no. 3 (Autumn, 1979): 285-286. Until the 20th century when the word "toilet" came into use, American consumers used the term "water closet" to refer to the fixture itself and not the room in which it was located

porches. Indoor plumbing could exist without being connected to a public water source by drawing on top floor tanks, cisterns, pumps, or by piping water from nearby springs to the home.[116] It was only after major water systems were in place that household plumbing became linked to sewers and mains.[117] Well-to-do houses commonly had wooden washtubs, a lead kitchen sink, a water closet, marble washstands, and a bathtub lined with lead.[118] J. L. Mott Ironworks displayed an extensive line of cast-iron plumbing fixtures including sinks, toilets, and bathtubs in their company catalogues (figures 1.20 and 1.21).[119]



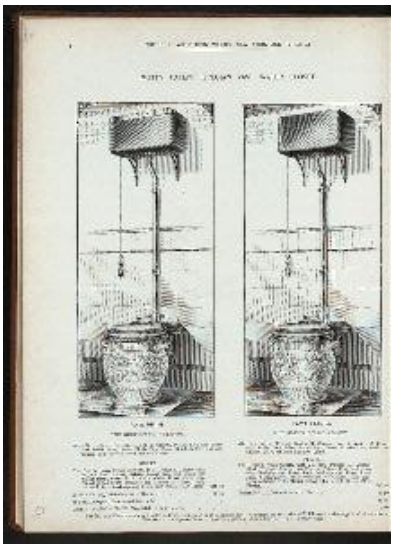


Figure 1.20 (left)-- Bath Room Interior by the J.L. Mott Iron Works, 1888 from the Catalogue, Illustrating the Plumbing and Sanitary Department of the J.L. Mott Iron Works, 1888. New York Public Library Digital Gallery, accessed December 8, 2011, http://digitalgallery.nypl.org/nypldigital/, Courtesy of The New York Public Library. www.nypl.org.

Figure 1.21 (right)-- Mott's patent Grecian vase water closet, 1877-1893. Illustrated circular advertisments from J.L. Mott Iron Works. New York Public Library Digital Gallery, accessed December 8, 2011, http://digitalgallery.nypl.org/nypldigital/, Courtesy of The New York Public Library. www.nypl.org.

[116] Maureen Ogle. *All the Modern Conveniences: American Household Plumbing, 1840-1890 (*Baltimore: John Hopkins University Press, 2000), 19.
[117] Ogle, *All the Modern Conveniences*, 93.
[118] Stone, "The Plumbing Paradox," 285-286.
[119] Stone, "The Plumbing Paradox," 286.

In New York, plumbers could now install new fixtures in kitchens and bathrooms connecting them to city mains carrying Croton water. Yet, indoor water remained unavailable to the poor who lived in tenements. In 1870, the city installed the first public baths targeted at the poorer population.[120]

In addition to indoor plumbing and to the waste of water, water use increased tremendously in the years after Croton due to the dramatic rise in population. The population on the island of Manhattan was 515,547 in 1850 and it grew to 942,292 by 1870. As the population and the demand for water grew, Croton water and the Croton system continued to have its critics. When the system had to shut down temporarily, the hardship caused by water stoppage at a public fountain in New York warranted a visual depiction in *Harper's Weekly* in 1860 (figure 1.21). Insufficient quantity persisted as an ongoing issue. In this undated cartoon, water supply

Figure 1.22: Scene at the City Hall Place Pump. Near the Five Points, During the Stoppage of the Croton Water, Virtual New York, Accessed January 23, 2011, http://www.vny.cuny.edu/Search/search_res_image.php?id=125,

is scarce, demonstrated by the fact that a boy has chosen to drink the water intended for his bath (figure 1.23) . In response to continued need, in 1861, the city completed a project to expand

[120] Gandy, *Concrete and Clay,* 38. Marilyn T. Williams, *Washing "the Great Unwashed": Public Baths in Urban America, 1840-1920* (Columbus: Ohio State University, 1991), 10. It was not until 1897 that public baths were seen as a valuable asset that progressive American cities must provide.

Figure 1.23: Caption: Reads: "Grocer -- Yaas, Mr. p'leeceman, he be von dirty boy; I give him whole bucket water to wash hisself, an' he drink it all up, he so dry, he say." Virtual New York, accessed January 23, 2011, http://www.vny.cuny.edu/Search/search_res_image.php?id=484.

the water capacity of the Croton Aqueduct by raising the High Bridge by six feet and by adding a larger main on top of the two existing pipes, so that delivery could be increased from 72,000,000 to 95,000,000 gallons per day (figure 1.24)[121] Another enlargement of the system took place in

Figure 1.24 – High Bridge during construction of the large main 1862, :A. Brown & Company, New York Public Library Digital Gallery, accessed February 24, 2012, http://digitalgallery.nypl.org/nypldigital/, Courtesy of The New York Public Library. www.nypl.org.

[121] *The Old Croton Aqueduct, 55.* Galusha, *Liquid Assets*, 38.

1862 when the city completed the construction of an additional reservoir in Central Park called Lake Manahatta, located in Central Park just next to the Yorkville Receiving Reservoir (figure 1.25).[122]

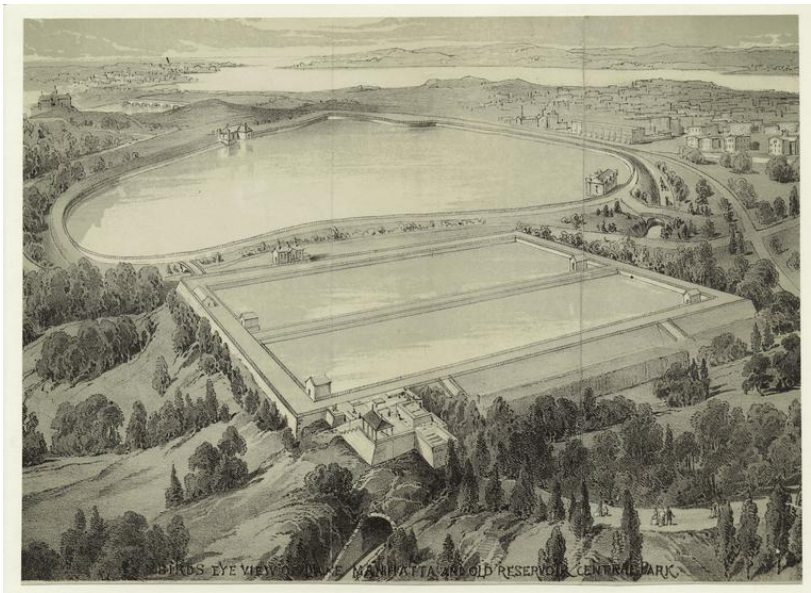


Figure 1.25 - Birds eye view of Lake Manhatta (background) and old reservoir Central Park, New York Public Library Digital Gallery, accessed February 24, 2012, http://digitalgallery.nypl.org/nypldigital/, Courtesy of The New York Public Library. www.nypl.org.

But with Lake Manhatta's creation, the continuing utility of the Murray Hill Reservoir came into question. In the 1870s, as wealthy families built brownstones in the neighborhood, concerns surfaced about the reservoir's visual appearance and its functionality. By this time, the city had laid additional water mains under Manhattan streets and built a new distributing reservoir in Central Park, thereby expediting the 5th Avenue reservoir's eventual obsolescence.[123]

As the city grew and as its population increased, the distributing reservoir's role as solely a water distribution site was thrown into doubt. Back in the 1840s, all Croton water was distributed from the Murray Hill reservoir, but as the city expanded northward, this original system

[122] Hall, *Water for New York City*, 64.
[123] "Murray Hill and the Reservoir," *New York Times*, February 27, 1898, 4.

no longer made sense. Furthermore, to address the increased consumption of water, the city had constructed an additional storage facility, Lake Manahatta.[124] "The Central Park structures are both receiving and distributing reservoirs," *The New York Times* reported, "Their capacities are vastly greater than that of the Forty-Second street structure, which is scarcely large enough to hold one-fiftieth part of the total storage now in all the reservoirs, without taking into account the quantities of water in the great mains throughout the City."[125]

Furthermore, although still under construction in 1870, once completed, the high-service tower and reservoir at High Bridge would provide water to the more elevated sections of the island of Manhattan. In 1870, the State legislature passed Chapter 137 of the Laws of 1870, which reorganized the local government and also created the city-based Department of Public Works (DPW). The DPW superseded the Croton Aqueduct Department and the Street Improvements Department.[126] This newly created public entity possessed broader powers than its predecessor.[127] Unfortunately, when Mayor A. Oakley Hall appointed the first commissioner of the DPW, he selected none other than William M. Tweed, whose name is now inextricably linked with municipal corruption. Boss Tweed and his associates, who became known as the Tweed Ring, engaged in widespread political graft. Once involved in water supply, Tweed embezzled funds and received kickbacks from contractors.[128]

As Commissioner, Tweed proposed a bill that would grant him unmitigated power to condemn and purchase land upstate for the purposes of supplying the city with water. When this bill became law in February of 1871, a writer for the *Putnam County Courier* commented, "No despot in Europe has such limitless power over the exchequer of his country as this bill confers

[124] "Removal of the Reservoir," *New York Times,* June 8, 1881, 1.
[125] "Removal of the Reservoir," *New York Times,* June 8, 1881, 1.
[126] Wegmann, *The Water Supply of New York,* 76 -77.
[127] Gandy, *Concrete and Clay,* 253.
[128] Galusha, *Liquid Assets,* 39.

upon Mr. Tweed."[129] However, in 1874, the 1871 act was repealed and Boss Tweed was convicted on charges of embezzlement. Tweed died in jail four years later.[130] Although the city gained a degree of power with the creation of the DPW, political corruption undermined municipal authority over the water supply.

In 1870, the DPW had inherited the high service project. While the original plans were for the pumping station at High Bridge to supply water to the surrounding elevated area, in 1874, the city installed a new main from the High Bridge reservoir to the south to deliver water to other parts of the city on high ground.[131] By 1875, the DPW was well aware of the dire need for another aqueduct, but because of "condition of city's finances," the department decided not to act at that time.[132]

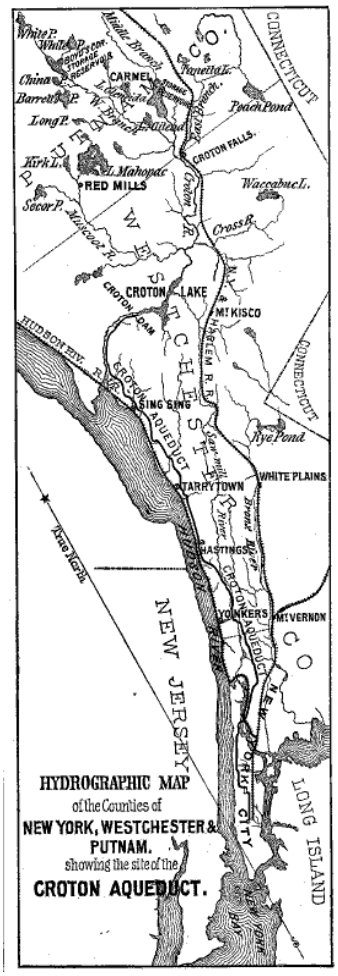
A larger and stronger public apparatus would be needed to manage the increased demand for water and to attempt to curb the continued waste of water. Waste of water continued to be a pressing issue, especially during the winter months, when residents continued the habit of running the water all night to keep the pipes from freezing. More stringent metering would be required with the idea being that if people had to pay for every drop of water, this freezing prevention practice would cease. Professor Chandler of the New York Metropolitan Board of Health advocated for the home metering systems that had been successfully installed and used in Liverpool and Glasgow. In 1877, Chandler declared:

> To measure out and sell by the gallon the bountiful gift of Croton would be a crime against the city. As a life-saving and life-protecting agent, pure water is hardly second to pure air, and it is the most valuable servant the sanitary authorities call to their aid. Nor is there any other object for which the public funds can be more legitimately expended than

[129] Galusha, *Liquid Assets*, 44.
[130] Galusha, *Liquid Assets*, 44.
[131] Wegmann, *The Water Supply of New York,* 96.
[132] Wegmann, *The Water-Supply of the City of New York.*108.

> for increasing the facilities for using water by the erection of many accessible free public baths. While filth debases, cleanliness exalts.[133]

New York had a more abundant supply of water than many other modern cities. While Liverpool and Edinburgh had thirty gallons of water per person per day, and London and Glasgow had fifty gallons per person daily, New York enjoyed double that of London, with one hundred gallons per day per person.[134] An 1881 map (figure 1.26) showed where New York's water came from.



[133] William H. Rideing, "The Croton Water," Scribner's Monthly, An Illustrated Magazine for the People, volume 0014 Issue 2 (June 1877), 161-176. Accessed June 10, 2012, http://ebooks.library.cornell.edu/
[134] William H. Rideing, "The Croton Water," Scribner's Monthly, An Illustrated Magazine for the People, volume 0014 Issue 2 (June 1877), 161-176. Accessed June 10, 2012, http://ebooks.library.cornell.edu/

Figure 1.26: Hydrographic Map, William H. Rideing,"The Croton Water," Scribner's Monthly, An Illustrated Magazine for the People, volume 0014 Issue 2 (June 1877), 163, accessed June 10, 2012, http://ebooks.library.cornell.edu/.

By 1880, it was clear to engineers and city officials alike that a new and larger aqueduct must be built in order to relieve the pressure on the Croton Aqueduct.[135] The city's population was consuming between 100 million and 125 million gallons of water a day.[136] Especially in the wake of the two devastating droughts of the summers of 1880 and 1881, the clamor for more clean water to be brought to the city intensified.

Conclusion

Public and private management coexisted in New York's early water history and concerns about sufficient water quantity and quality consistently plagued city residents. City officials viewed water provision as a prohibitively expensive undertaking and their fear of this high cost drove the decision to outsource water management to private companies. New York's government did not take on the provision of water as its direct work until after two failed attempts to have private companies handle the projects and until the growth of the city demanded the transport of new sources of water to the city. In the 1830s, an era marked by bitter power struggles between the Whigs and the Democrats and by a sharp divide between rich and poor, increased demand for water and the lack of local supply pushed the city to build the public Croton Aqueduct. In 1834, the State signified its support of public water by passing legislation to enable the city to build the new waterworks and in 1835, the majority of New York voters endorsed this public system.

[135] Charles H. Weidner, *Water for a City: A History of New York City's Problem from the Beginning to the Delaware River System (*New Brunswick: Rutgers University Press, 1974), 68.
[136] Weidner, *Water for a City*, 68.

In 1842, Croton water arrived in New York. But this event was not the culmination of the story. The Manhattan Company was out of the water business after 1842, but other private water companies became involved later in the century. As Croton water increased access to water from private homes through indoor plumbing now connected to city mains, people began to take water for granted and to waste it in the 1850s and 1860s. Even in its triumph of Croton system, the city needed greater power and control to supply and manage water. In the 1880s, the public bureaucracy was not in place to do so over the long-term. Although the city and state had established the Board of Aqueduct Commissioners, the Department of Public Works, and the Mayor's Water Committee, the division of labor and authority between them remained unclear. The New York area witnessed a huge expansion of private water companies in the 1880s.[137] Broader studies have shown that public ownership of water across the United States declined, for the first and only time, in the 1880s.[138] In short, public water was not yet secured. Yet, it was between 1883 and 1917, as this study will show, that people began to think of water as public and behave toward water as if it were publicly supplied and managed.

Initially, New York's government involved itself in water supply for fire prevention, but it did not view providing clean water for consumption or for household use as within its purview. Throughout the nineteenth century, New Yorkers experienced and participated in the changing role, use, meaning, and understanding of water, as it shifted from a narrowly defined vehicle for

[137] The following fifteen private water companies founded in the 1880s operated in Brooklyn, Richmond, Westchester, and Queens : Coney Island Water-Works Company, Kings County Water Supply Company, Long Island Water Supply Company, Flatbush Water-Works Company, Blythebourne Water Company, West Brooklyn Water Company, Queens County Water Company, Jamaica Water Supply Company, Queens County Water Company, New Brighton and Port Richmond, Richmond Company, Staten Island Water Supply Company, Mount Vernon Water Company, New Rochelle Water Company, Pocantico Water-Works Company, Port Chester Water-Works. Additional companies were established in the 1870s and 1890s. See Baker, M.N., editor. *Manual of American Water-works, 1897*. New York: Engineering News Publishing Company, 1897.

[138] Debora Spar and Krzysztof Bebenk, "To the Tap: Public versus Private Water Provision at the Turn of the Twentieth Century," *Business History Review* 83, Winter 2009: 675-702.

extinguishing fires to both an essential agent of sanitation and a popular beverage.[139] Historian Matthew Gandy posited that this increased use of water would become an indicator of modernity.[140] The transformation from water scarcity to an abundance of water played a significant role in shaping the perception of public water. It led to the modern mindset of taking water for granted, of believing that it should be free of cost, and of assuming that supply would be infinite. With the increased focus on water, water became an indispensable commodity, forcing the city government to manage its availability. Assumptions about water, its utility, its monetary value, and its place in the market economy shifted over time. But it would take time for water to become fully public and until then supplying water remained simultaneously an entrepreneurial venture, a city-managed benefit, and a charitable enterprise.

[139] For a poignant discussion of the changing meaning of water in the French context, see Jean-Pierre Goubert, *The Conquest of Water* (Princeton: Princeton University Press, 1989).
[140] Gandy, *Concrete and Clay,* 35.

CHAPTER 2: Public Water and the Urban Public, 1883-1890

"Free Ice Water for the Public" declared *The New York Times* on July 2, 1880. The Business Men's Moderation Society, a New York-based temperance association, opened a new public drinking fountain outside the Post Office in lower Manhattan at Park Row that day. This fountain, capable of dispensing eight barrels of water, drew its water from the water main supplying the Post Office with Croton water. Before reaching the spigot, the water passed through a large cake of ice and then through four filters, making it a cool, refreshing beverage. Covered with an awning and presented by the president of the Business Men's Moderation Society, the fountain cost $400 to install. A formal dedication marked the opening of the fountain.

As would be expected, the speakers at the dedication each recommended temperance and moderation. But, in what might be surprising to a twenty-first century reader, some speakers suggested that this moderation be applied to the drinking of water, not just to beer, wine, and liquor. The president of the Wine and Spirit Trader's Society, Colonel Loeser, told the assembled group that he had always considered water a dangerous beverage. Loeser believed "that liquor dealers should encourage (water's) use in moderation as a business measure." By so doing, he said, they would "keep people alive as long as possible, and would not bury all their best customers."[1] After the speeches, as if to model for the assembled public, the officers of the Business Men's Moderation Society each drank from the new fountain. Of course, wine traders did not want to their customers to become water drinkers, as that could decrease their sales, but ambivalence about water as a beverage was not confined to those who bought and sold alcohol. Many people worried about the safety of drinking water at this time.

[1] "Free Ice Water for the Public," *The New York Times*, July 2, 1880.

Some physicians were skeptical about allowing their patients to drink cool water, while others promoted this practice. "There is a curious and active prejudice in the public mind against the free use of water, as a drink, under certain conditions: and this prejudice sometimes extends to the sick-room, without perhaps, the knowledge of the physician," stated Dr. Forsyth Meigs in a clinical lecture called *On the Internal Use of Water for the Sick and on Thirst* , which he delivered at Pennsylvania Hospital in March of 1880. Although water was becoming a more popular beverage, questions still remained about its salutary value and safety. In his talk, Dr. Meigs mentioned that he had observed that oftentimes laborers were afraid to drink water when they were parched from their work. "At the very moment when he is fast losing its fluids, during labor in hot weather, by sweating, and by rapid evaporation from the lungs and skin, the laborer is afraid to drink, lest he may chill, as he says, his stomach, or injure in some mysterious way, his desiccated body," he explained.[2] In fact, doctors had in the past warned patients to abstain from drinking cold water.[3] But some medical professions and some members of religious communities, especially the temperance movement, advocated that people drink water for health reasons.

This chapter examines the shifting public perception of water as New Yorkers interacted with city-supplied water in three select ways between 1883 and 1890. First, recently-arrived immigrants drank from charity-run water fountains fed by city mains. Such charities promoted water as a free, healthy drink to replace beer and rum and immigrants utilized these fountains extensively throughout the summer months. Second, working and middle class New Yorkers

[2] *The Friend: A Religious and Literary Journal*, March 13, 1880, 53, 13, 246.
[3] Common wisdom during the cholera outbreak of 1832 was to avoid drinking water. A broadside issued by the Sanitary Committee and Medical Counsel that year cautioned: "Abstain from cold water, when heated, and above all from ardent spirits, and if habit have rendered them indispensible, take much less than usual.…Avoid getting wet…" New-York Historical Society, reprinted in John Noble Wilford, "Plagues of New York: How Epidemics Helped Shape the Modern Metropolis," *New York Times*, April 15, 2008, F1.

visited the High Bridge of the Old Croton Aqueduct, where they experienced public water infrastructure first hand. As they participated in this visually arresting site of public water, which was often represented in the visual record, a corresponding popular awareness of water as a public resource began to take shape. Third, the reading public followed the news about the construction of the impressive New Croton Aqueduct through *Scientific American* and *The New York Times.* Anyone interested could also attend public meetings about the project held by the city government. For the first time, city officials made an effort to share information with the public about the process of building and financing this new aqueduct. Finances would be transparent and the developments in the new infrastructure would be made known to the public, even though the tunnel would be hidden underground, rather than displayed dramatically above ground, as was the case with the Old Croton Aqueduct at High Bridge. After the disastrous mismanagement of the DPW under Boss Tweed in the 1870s, the city needed to control municipal corruption to regain public trust. In short, the city would administer the new aqueduct publicly. By drinking Croton water from charity-run fountains, by interacting with sites of infrastructure, and through reading about the construction of the new Croton system, New Yorkers came to think of water as abundant and as managed by the public sector, even before the city and state possessed the capacity to make water fully public. Each of these interactions with city-supplied water bolstered the publicity of water, the idea that water was a public utility to be managed in plain view of the people.

Faith in Fountains: Private Charities and the Immigrant Population

Drinking-water fountains made the news in nineteenth century New York. On December 18, 1880, *Harper's Weekly* reported on the opening of a new drinking fountain, designed with separate spigots for people and for horses, located at Madison Avenue and 23rd Street (figure

2.1). It was not clear who sponsored this fountain, but it was designed to serve the well-to-do neighborhood near the fountain. Since the summers of 1880 and 1881 were particularly hot in

Figure 2.1: New Drinking Fountain, Madison Avenue and Twenty-Third Street, *Harper's Weekly*, December 18, 1880, 809.

New York, cool water to drink was a much sought-after commodity. On July 10, 1880, the free ice-water fountain run by the Business Men's Moderation Society, and located in front of the Post Office on Park Row, "had more customers than the neighboring beer shops, and that is saying a good deal," *The New York Times* reported.[4] This fountain was able to hold four barrels of water, dispersed through four faucets. An attendant managed the fountain and provided glass tumblers to patrons. An inscription above the fountain read, "Free Ice-Water, by the Business Men's Society for the Encouragement of Moderation."[5]

Another drinking fountain, painted fiery red and located in the Five Points neighborhood, attracted thousands of thirsty patrons. "Rag-pickers, blacksmiths, and laboring men of all

[4] "Chronicles of a Hot Day, Warmer in New York than in New Orleans," New York Times, July 10, 1880, p. 5.
[5] "Home and Foreign Gossip," *Harper's Weekly*, July 24, 1880, p. 478.

descriptions make frequent pilgrimages to the fountain," reported *Harper's Weekly* on July 30, 1881, "It consumes about half a ton of ice a day, and Croton water pours in upon the ice through a three-quarter inch pipe."[6] This article also mentioned another drinking fountain at Union Square run by R.H. Macy & Company and the well-known Park Row Post Office fountain run by the Moderation Society. Since many large cities were establishing drinking water fountains at this time, the article included a double-page illustration showing "an eager group about one of these fountains in a crowded London thoroughfare" (figure 2.2).

Figure 2.2: A Sultry Day, *Harper's Weekly,* July 30, 1881, 523.

During the humid summer months of 1881, water was in scarce supply due to a severe drought and it was the recently-arrived immigrants and lower classes who were hardest hit by these circumstances. Low water pressure meant that water did not rise above the first stories of the tenement houses of Manhattan's lower classes. In short, there was not enough supply to

[6] "A Sultry Day," *Harper's Weekly*, July 30, 1881, 523.

draw up through the pipes.[7] Water supply in some tenements came from one small pipe with faucets located on each floor. A landlord could choose to install a hand pump on the pipe, so residents could pump water up, as if drawing it from a well. Such a pump meant that a limited supply of water would be obtainable. However, in most tenements, there were no hand pumps or faucets installed on each floor. Rather, a single faucet on the ground floor, often in the courtyard, served to supply fifty to one hundred residents, who would carry the water up to their rooms.[8] By 1882, with thousands of immigrants arriving each week, *The New York Times* reported that "the health of families…was jeopardized because sufficient water could not be secured."[9]

Churches attempted to ameliorate this dire situation. In May of 1883, the Carmel Church at 174 Grand Street in Manhattan opened a new ice-water fountain. In June, the church sought donations of up to $75 to supply the fountain with ice in order to keep the fountain running. "Crowds of people drink from it daily," *The New York Tribune* reported, "and a great amount of water is carried in pails and bottles for the use of people working in the factories in the neighborhood."[10] In early July 1883, the Business Men's Moderation Society reopened their Park Row fountain for the summer season, which was "welcomed by many thirsty persons during the day."[11] Later that month, the Society built a new ice water fountain "in the middle of the plaza at Five Points."[12] In early August, the Boys' Loyal Legion Temperance Society sponsored an ice water fountain on the corner of Grand Street and Centre Market Place to be

[7] Nelson Blake. *Water for the Cities: A History of the Urban Water Supply Problem in the United States*. (Syracuse: Syracuse University Press, 1956.), 277. Construction began on the new Croton Aqueduct and dam, the East Branch Reservoir, and four other reservoirs between 1888 and 1897. "No Water for Fountains," *New York Times*, February 16, 1896.
[8] "No Water for Fountains," *New York Times*, February 16, 1896.
[9] David Grann, "City of Water," *New Yorker* (2003): 88-103.
[10] "Money Need For An Ice –Water Fountain" *New York Tribune*, June 16, 1883, 8
[11] A Free Ice-Water Fountain," *New York Tribune*, July 3, 1883.
[12] Home News, *New York Tribune*, July 19, 1883

operated by the Carmel Church. "Being in a portion of the city where the people are poor, it proves a daily blessing," *The New York Evangelist* reported. "The water is carried away in pails and pitchers, while there is a steady line of patrons, young and old, waiting their turn for a cooling drink."[13] The operators of this fountain also sought financial assistance. "The expenses of the fountain are about $1.50 per day," *The New York Evangelist* continued, "It will require at least $50 to continue its good work the balance of the season. Donations may be sent to the pastor, the Rev. John Dooly, 174 Grand Street, City."[14]

In the summer of 1883, Reverend Edward Judson also built a public water fountain at the Berean Baptist Church (figure 2.3), located on the corner of Bedford and Downing Streets.

Figure 2.3: Fresh Air, Cool Water and Flower Fund, June 15, 1910. Judson Memorial Church Archive, MSS 94, Fales Library and Special Collections, New York University.

For Judson, there was a particular evangelical dimension to the water, which made the drinking fountains project particularly compelling. On October 26, 1883, *The New York Tribune* reported that the Berean fountain was still running. "On the southwest corner of Downing and Bedford

[13] "Ice-Water Fountain for the Poor," *New York Evangelist,* August 2, 1883, 54, 31, 8
[14] "Ice-Water Fountain for the Poor," *New York Evangelist*, August 2, 1883, 54, 31, 8

Streets still stands a running ice water fountain with ice and water even though the present days are wintry ones, the expenses being defrayed by the Berean Baptist Church."[15] In a report from the Berean Church to the Southern New York Baptist Association dated October 20, 1884, Judson provided the following description of the early stages of the Cool Water project:

> During the six warm months we have kept a Free Ice Water Fountain in uninterrupted operation at the corner of the church. The water is kept at a temperature of forty-five degrees, so that it may form a refreshing beverage without being cold enough to do harm. Men, women and children may be seen drinking all day long during the hot weather, and even later in the night, and pails and pitchers of the cool beverage are carried to the sick in the close tenements. We believe that this fountain abates, in a measure, the nuisance of beer drinking, and also serves as an invitation to taste of the Water of Life.[16]

The drinking water fountain would attract the local immigrants to the church and then Judson would be able to draw them to the Gospel. For Judson, providing social services, such as pure drinking water, was essential. Like many of his peers, Judson had a strong aversion to secular charity, government programs, and philanthropic efforts, believing that the church should be the sole provider of social services.[17] In order to better serve the immigrant community, Reverend Judson planned to relocate his congregation to a new building, the Judson Memorial Church, on the corner of Washington Square South and Thompson Streets.[18] Judson believed

[15] Home News, *New York Tribune,* October, 26, 1883
[16] *Report of the Berean Church to the Southern New York Baptist Association*. Judson Memorial Church Archive, MSS 94, Fales Library and Special Collections, New York University.
[17] Joan Jacobs Brumberg, *Mission For Life: The Story of the Family of Adoniram Judson, the Dramatic Events of the First American Foreign Mission and the Course of Evangelical Religion in the 19th Century.* (New York: The Free Press, 1980), 184.
[18] "In Adoniram Judson's Memory: Laying of the Cornerstone of a New Baptist Church," *The New York Times,* July 1, 1890, 8.

that this site would be "a strategic position"[19] for the new church because it marked the boundary between rich and poor neighborhoods.

Throughout the nineteenth century, the Washington Square area, also known as the Ninth Ward, was referred to as the "American ward," because of its small number of foreign-born residents. However, in the 1890s, as newly arrived European immigrants moved into the neighborhoods south of Washington Square Park and as wealthy families relocated to neighborhoods further north in Manhattan, the demographics shifted.[20] About the new location Judson wrote, "It is close to a large tenement-house population, and also yet within reach of a most respectable and aristocratic neighborhood, from which it is hoped many will come to engage personally in Mission work." [21] A map included in the 1890 fundraising brochure shows the location of both the Berean Church and the Judson Memorial Church (figure 2.4).

[19] *The Cornerstone of the Judson Memorial Baptist Church Edifice.* Judson Memorial Church Archive, Fales Library and Special Collections, Bobst Library, New York University.
[20] Mindy Cantor," Washington Arch and the Changing Neighborhood," *Greenwich Village: Culture and Counterculture.*(New Brunswick: Rutgers University Press, 1993).
[21] *The Cornerstone of the Judson Memorial Baptist Church Edifice.* Judson Memorial Church Archive, Fales Library and Special Collections, Bobst Library, New York University.

Figure 2.4: Map of Location of Both Churches. Judson Memorial Church Archive, MSS 94, Fales Library and Special Collections, New York University.

At this new location, on September 20, 1891, Reverend Judson presided at "the open air services" to unveil the first new ice water fountain located at the Judson Memorial Church. This fountain, a memorial to Reverend Duncan Dunbar, the pastor of the Macdougal Street Baptist Church, consisted of two bronze dolphins from whose open mouths the water flowed into a large marble basin. The inscription on the fountain read: "And the Spirit and the Bride say, come: and let him that heareth, say come: and let him that is athirst come, and whosoever will, let him take the water of life freely." A large crowd attended the opening ceremony for this new water fountain.[22]

Operating this chilled-water drinking fountain required an elaborate mechanism. In the basement of the church, Judson had installed a large zinc-lined box, which could hold one ton of ice. Through this box ran a coil of nearly 400 feet of pipe through which the water ran to the fountain on the outside the church. Packing ice around the coil kept the water chilled. "The

[22] "Unveiling a Drinking Fountain: Interesting Ceremonies at the Judson Memorial Church," September 21, 1891, *New York Tribune,* 5.

water does not flow constantly from the fountain," reported *The New York Tribune*, "but is turned on by means of a faucet, which can be reached handily by the thirsty wayfarer."[23]
It is not clear in the records from where Judson obtained the water for his fountains, either from the city mains or from local wells. Since the Ninth Ward had voted against Croton water in 1842, there is reason to believe they had their own supplies, although by the 1880s, the quality of well-water was dubious. In fact, the Board of Health prohibited the use of water drawn from the city wells in 1884.[24] Therefore, the most likely source was a water main supplying the church with Croton water, like the fountain run by the Moderation Society at the Post Office. In the 1890s, water traveled from the Croton watershed to Judson Memorial Church via the Old Croton Aqueduct to reservoirs at Forty-Second Street and then through underground mains to locations south. Judson most likely paid a rate determined by water meter, as was the case for businesses, whereas residences paid a frontage rate not tied to usage. The Judson Memorial Church is not listed in the Department of Water Supply Annual Report for 1898 alongside other churches and charities which were exempted from paying for water.[25]

The genius behind Judson's water fountain initiative was that the cool water offering served as both altruism and as advertising for the church and its mission. The Duncan Dunbar fountain, attached as it was to the church building on the corner of Thompson Street and Washington Square, ensured that people would come to the church (figure 2.5).

[23] "Unveiling a Drinking Fountain: Interesting Ceremonies at the Judson Memorial Church," September 21, 1891, *New York Tribune,* 5.
[24] "Impure Water from Wells," *New York Times*, July 13, 1884, p. 7
[25] See the *First Annual Report of the Department of Water Supply of the City of New York, 1898.* (New York: Martin B. Brown Company, 1899.

Figure 2.5: Fresh Air, Cool Water and Flower Fund, June 15, 1910. Judson Memorial Church Archive, MSS 94, Fales Library and Special Collections, New York University.

There was an undeniably social dimension to the fountain. Groups gathered there to draw their water. This visual trope of water fountains as public gathering places, where the needy could receive social services and possible religious guidance, served as a powerful tool to solicit donations to the Judson mission. The water fountains project was one of many social services provided by the Judson Memorial Church. Since providing social services and constructing a new church cost money, Judson became an adept fundraiser from New York's upper class. The water fountains project also served as an ideal fundraising appeal. Judson included the images of the Berean and Judson Church fountains in his fundraising brochure sent to potential donors to the church's mission. Offering concrete assistance to meet the practical and daily needs of local immigrants became Reverend Edward Judson's signature interpretation of the Social Gospel movement.[26] Recently arrived immigrants from southern Italy comprised the main population served by the Judson Memorial Church's social welfare programs. These immigrants needed water and the church supplied it to them.

[26] The Social Gospel was a moral reform movement from 1880-1920, through which religious leaders and activists advocated for the poor.

As we have seen, Judson Church was not alone in choosing to provide drinking water to the public. Reverend Judson collaborated with other charitable organizations, such as the Children's Aid Society and the Women's Municipal League, on his drinking fountain project, and many other churches and temperance societies built and maintained their own water fountains.[27] The Moderation Society had been involved in public water fountains since its founding in 1879.[28] Its free ice-water fountain at the Park Row Post Office, which gave out more than 2,000,000 drinks during the summer and more than 20,000 drinks per day, was described as an "incalculable blessing to the poor and sickly of the city."[29] When, on August 13, 1890, street paving forced the Moderation Society to close its free water fountain on Park Row, "which for fourteen years has given from 13,000 to 25,000 persons daily in the sultry summer a glass of ice water,"[30] an uproar ensued. The crowd of "poor laborers, immigrants and boys" that gathered to demand ice-water had to be restrained by Post Office officials in an effort to avert violence.[31]

In addition to its fountain on Park Row, the Moderation Society operated a water tank on wheels, known as the "perambulating fountain." This tank made its rounds in the downtown area distributing drinks of water, ending in Five Points, where the ice was given away.[32] "Only those whose way takes them through the slum," *The New York Tribune* reported, "with its tall tenements packed with all conceivable kinds of human misery and distress, and who have seen

[27] Of these agencies, just the Children's Aid Society appears in the Department of Water Supply Annual Report from 1898 as having been granted an exemption from paying for their water on pages 141 and 145. Address of the fountain not listed.
[28] *Charities: The Official Organ of the Charity Organization Society of the City of New York.* Issue for August 24, 1901, 166. "Free Ice Water in New York," *Boston Daily Globe,* July 17, 1899, 6. The Moderation Society was the first to build water fountains, starting with Park Row Post Office fountain in 1897, then Five Points and Union Square, and last the perambulators in 1880.
[29] "Ice Water for the Poor: Good Work of the Moderation Society -- What has been done this summer," August 2, 1890, *New York Tribune,* 3.
[30] Closing a Free Ice-Water Fountain," August 13, 1893, *New York Tribune,* 4.
[31] Closing a Free Ice-Water Fountain," August 13, 1893, *New York Tribune,* 4.
[32] "Ice Water for the Thirsty," *New York Times,* June 14, 1891, 16.

the throngs of pallid, careworn women and sickly children crowding round the society's perambulator fountains or staggering under the weight of pitchers filled to the brim with ice water, are able adequately to realize the nature of the benefit conferred on their poorer fellow creatures."[33] Photographs of the perambulating fountain appeared in *The New York Tribune* on August 13, 1897 (figure 2.6).[34] The temperance movement drove the Moderation Society's

Figure 2.6: Ice Water Perambulator, *New York Tribune*, August 3, 1897, 5.

provision of drinking water. "That the ice-water fountain acts as a powerful factor in the cause of temperance," reported *The New York Tribune*, "especially in the reduction of summer drunkenness, has long ago been fully recognized, while a speculative statistician would have an interesting half-hour's labor in trying to compute the number of fever and cholera epidemics that

[33] "Ice Water for the Poor: Good Work of the Moderation Society -- What has been done this summer," August 2, 1890, *New York Tribune*, 3.
[34] "Ice Water Perambulators: Charity Work Being Done by the Moderation Society," *New York Tribune*, August 3, 1897, 5.

have been averted by its aid."[35] New Yorkers relied on these drinking water fountains, which were open to the public but managed by private charities. The demand for water from such charitable organizations highlighted the city's inability to provide enough water to the increased number of immigrants in the 1880s and 1890s. A photograph from 1897 shows a gathering around a drinking water fountain in lower New York (figure 2.7).

Figure 2.7: Young children at a water fountain at Mulberry Bend, ca 1897, Museum of the City of New York, accessed August 7, 2012, http://collections.mcny.org/.

During the nineteenth century, New York experienced an overwhelming increase in population due to immigration. From 1865 to 1873, over 200,000 immigrants landed in New York each year. After the Panic of 1873, these numbers decreased and in 1877, only 63,000 immigrants entered New York through the state-operated arrival center at Castle Garden. The new federal Board of Immigration took over the management of New York's immigration in

[35] "Ice Water for the Poor: Good Work of the Moderation Society -- What has been done this summer," August 2, 1890, *New York Tribune*, 3.

1890 and opened Ellis Island on January 1, 1892, which received 445,987 immigrants in its first year of operation. Five years later, approximately 1,500,000 immigrants had arrived in New York through Ellis Island. From the1870s to the 1890s, African Americans from the American south arrived in New York in increasing numbers. Immigrants came from Germany, Ireland, Italy, and throughout Eastern Europe. The 1880s and 1890s witnessed increased numbers of Russian Jews arriving in New York. Whereas immigrants from Eastern Europe tended to be Jewish families from urban locations, immigrants from Italy were predominately Catholic bachelors from the countryside. Chinese immigrants came in much smaller numbers, especially when compared with large numbers of immigrants from Eastern and Southern Europe.[36]

The dramatic rise in population resulted in increased consumption of the city's drinking water at a greater rate than ever before. It became imperative yet again to import additional sources of water from outside New York City. This increase in population coupled with the fact that water distribution remained inequitable combined to make supplying drinking water philanthropic work. In the mid to late nineteenth century, charitable foundations began to build public drinking water fountains for the underserved communities. Water fountains generated attention. In turn, water as a charitable enterprise raised public awareness about the unmet need for water.

Water fountain projects like those run by Judson and the Moderation Society increased water's visibility as immigrants flocked to these fountains and as organizational public relations and newspaper reporters covered these events. These crowded fountains, their visual representation, and the press they received made the unmet need for water more visible. Charitable organizations were able to leverage the attention these fountains received to advertise

[36] Edwin G. Burrows and Mike Wallace, *Gotham: A History of New York City to 1898* (New York: Oxford University Press, 1999), 1111-1126.

their missions. Churches sought donations to support their water fountains in local newspapers. The Moderation Society's water fountain and the press it generated raised awareness about the temperance cause. The water fountain of the Judson Memorial Church drew Catholic immigrants to this new Baptist church on Thompson Street just south of Washington Square Park. Reverend Judson also ran a woodpile, medical services, a fresh air program, and job training sessions for the local community. Providing water had religious overtones, especially in the Baptist tradition, imbuing this service with an emotional resonance that made it very powerful. These drinking water fountains allowed private charities to capitalize on the emotional and symbolic meaning of water. Water was becoming a less dubious beverage and it was being provided to the poor free of charge from local religious organizations. The increased demand for drinking water from the rising immigrant population and the greater number of drinking fountains open to the public became an integral part of how the urban public interacted with public water.

Water Infrastructure in Daily Life: The Lasting Appeal of the High Bridge Aqueduct

In his novel set in 1870s New York, E.L. Doctorow describes the popular destination of the Murray Hill Reservoir, saying: "New Yorkers loved their reservoir. They strolled along the parapet arm in arm and were soothed in their spirits. If they wanted a breeze in summer, here is where it would blow. Puffs ripped the water. Children launched their toy sloops. The Central Park, well to the north, was not yet finished, all mud holes and ditches and berms of shoveled earth, a park only in the eyes of its imaginers. So this was the closest we could come to

pastoral."[37] This passage suggests the importance of this reservoir in the daily lives of New Yorkers in the nineteenth century. An even more popular destination was the High Bridge. In June of 1877, *Scribner's Monthly* described the High Bridge, saying:

> Every resident of the city knows where High Bridge is, no matter how dense his ignorance may be as to the other points of the water-service. It is one of the most popular resorts of the middle classes, and is within a few minutes' ride of the Grand Central Depot, or an hour's sail in the East River steamers from Peck Slip. On Sundays it is flocked with excursionists – principally workingmen with their wives and children in holiday dress – of whom it is a favorite promenade.[38]

New Yorkers' and tourists' enjoyment of the High Bridge and its environs would last into the twentieth century. Water was becoming more visible in public space through its much visited sites of water infrastructure, both within the city and outside the city. In the 1880s, public water infrastructure became part of daily life for New Yorkers. The High Bridge was a popular destination, serving as a showpiece of the publicly-managed Croton water system. As Chapter One showed, during the planning stages for the High Bridge, local landowners and politicians demanded that the section of the Croton Aqueduct that would cross the Harlem River be grand in appearance to augment the natural scenery. Modeling the new bridge after a classical Roman style aqueduct, Jervis and his engineers intentionally designed the High Bridge to be visually arresting. Completed in 1848, the High Bridge was built to be seen and admired. Given its dramatic appearance, the High Bridge served a monument to public works and to fresh water.

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[37] E. L. Doctorow, *The Waterworks*, (Random House: New York), 1994, 57.

[38] William H. Rideing, "Croton Water," *Scribner's Monthly, An Illustrated Magazine for the People,* Volume 0014 Issue 2 (June 1877), 161-176.

The High Bridge enjoyed popularity as a tourist destination, which continued into the twentieth century. In the late nineteenth century, city dwellers took respite from urban life in the fresh air of the countryside. Its status as a favorite leisure destination for city dwellers and tourists made the High Bridge a much reproduced visual trope. A hand-colored stereoview (figure 2.8) memorialized this image of the High Bridge as a souvenir for visitors. To visit the site, day-trippers hired a coach for five dollars or they took a bus from the Harlem Railway terminal for fifty cents round trip.[39]

Figure 2.8: View of Section from the Lower Banks: High Bridge, New York, No. 3. : New York Stereoscopic Co. – Photographer. Created 1859-1864: Robert N. Dennis collection of stereoscopic views.

In his 1886 travel guide, *The Hudson, from the Wilderness to the Sea,* Benson J. Lossing, described the "pleasant roads on both sides of the Harlem (that) lead to the High Bridge, where full entertainment for man and horse may be had." Lossing went on to say that the High Bridge was "a place of great resort in pleasant weather for those who love the road and rural scenery."[40]

[39] *The Old Croton Aqueduct: Rural Resources Meet Urban Needs*. New York: The Hudson River Museum of Westchester, 1992, 15.
[40] Benson J. Lossing, *The Hudson, from the Wilderness to the Sea,* New York: Virtue and Yorston, 1866, 371.

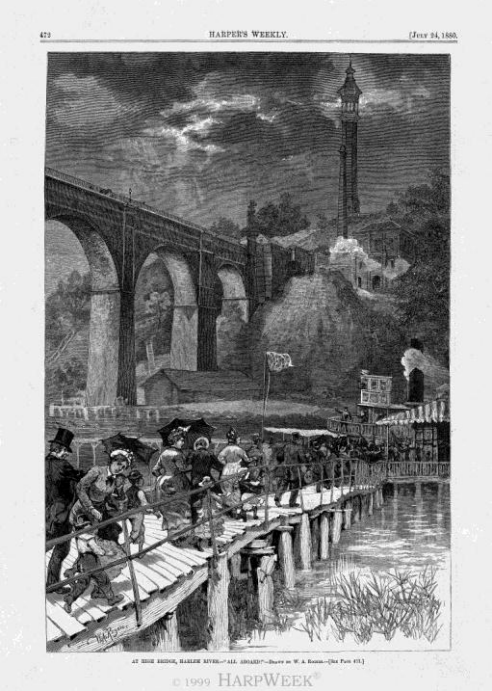

Figure 2.9: At High Bridge, Harlem River – "All Aboard". *Harper's Weekly*, July 24, 1880, Accessed March 29, 2011, http://app.harpweek.com/

In this drawing from *Harper's Weekly* in 1880 (figure 2.9), we see the High Bridge in the background and visitors on the ferry landing going home after their day-trip. The magazine promoted this outing suggesting that "one can enjoy the sight of the great structure over which rushes the supply of water for New York, take a walk over the high banks, or sit on shaded benches to watch the rowers on the Harlem River."[41] This description portrayed the High Bridge primarily as a leisure destination, although it does mention the role of the High Bridge as an aqueduct.

Another *Harper's* article with this image (figure 2.10) made a more concerted effort to emphasize the bridge's function. "High Bridge, it must be remembered, is not a thoroughfare.

[41] *Harper's Weekly*, July 24, 1880, p. 471.

Indeed, it is not a bridge for traffic at all, but the structure whereupon the Croton Aqueduct is extended across the river."[42] This article made special mention of the section of the High

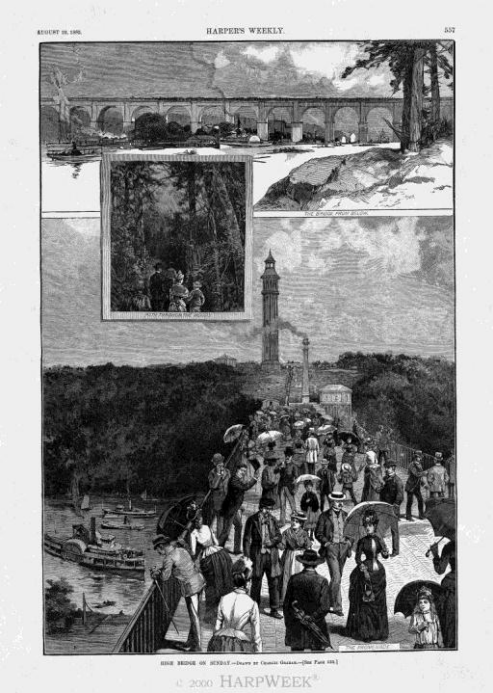

Figure 2.10: High Bridge on Sunday. *Harper's Weekly*. August 22, 1885, accessed March 29, 2011, http://app.harpweek.com/.

Bridge where the covering had been removed and "the stream which conveys more than 80 million gallons of water per day and supplies the metropolis is visible."[43] Again, we see this desire for visible evidence of the water being brought to the city. In the case of the boat arriving in the Yorkville Reservoir in June 1842, the city had made a deliberate choice to put on a performance which generated public attention. With the decision to design the High Bridge as a dramatic series of arches spanning the Harlem River, Jervis created a more permanent spectacle, a monument to running water from Croton that continued to garner attention from visitors and the press over the years.

[42] *Harper's Weekly*, August 22, 1885.
[43] *Harper's Weekly*, August 22, 1885.

As the High Bridge's popularity increased in the 1880s and 1890s, the Department of Public Works used its construction expertise to encourage visitors to spend their leisure time there. In June 1886, *Scientific American* reported on the High Bridge as a favorite resort, proclaiming that the main attraction was the famous bridge. Since most visitors approached the High Bridge from the Bronx side by ascending wooden steps in disrepair, safe access to the bridge became a concern. In 1885, the Department of Public Works remedied this situation by constructing a grand stone stairway (figure 2.11). In this image, we see the Bronx side, with the High Bridge on the left, and the stairs leading up to it, so visitors can promenade across to the Manhattan side.

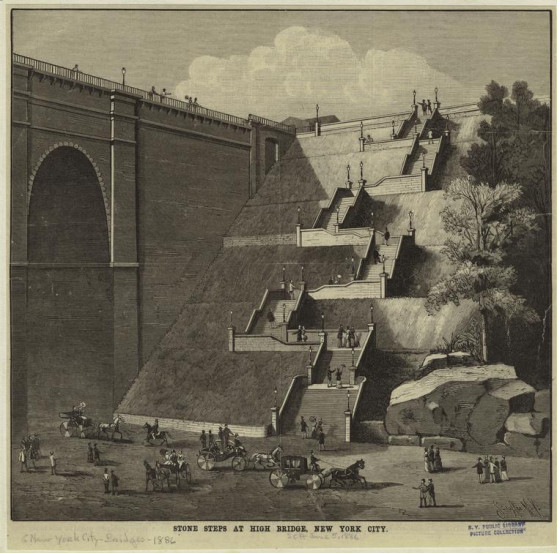

Figure 2.11: Stone steps at High Bridge, New York City. Published 1886. From *Scientific American*. (New York : Munn Co., 1845-), New York Public Library Digital Gallery, accessed March 29, 2011, http://digitalgallery.nypl.org, Courtesy of the New York Public Library, www.nypl.org.

"The short flights, separated by roomy landings…enable the traveler to more fully appreciate the beauties of the more attractive opposite shore, as it gradually expands before him,"[44] *Scientific American* reported in 1886. "These (steps) enhance the natural beauty of the surroundings and

[44] *Scientific American,* vol LIV, no. 23, June 5, 1886.

harmonize well with the massive bridge, to which they form a most fitting approach… The short flights…serve to lessen the fatigue of the upward journey and enable the traveler to more fully appreciate the beauties of the more attractive opposite shore, as it gradually expands before him."[45]

The High Bridge enjoyed a remarkable longevity as a leisure destination. Numerous postcards from the early 1900s, depict the bridge and its environs as a bucolic recreational location.[46] This postcard from 1898 (figure 2.12) emphasizes the boating opportunities available by featuring an inset of a scull and oars in connection with the site. In this image, we can see the Washington Bridge in the background behind the High Bridge. Many of the postcards include

Figure 2.12: High Bridge and Washington Bridge, New York, Collection of Leonard A. Lauder, New York, 1898.

[45] *Scientific American,* vol LIV, no. 23, June 5, 1886.
[46] Originally, senders wrote the message of their postcards on the picture side of the card and the address to which it was to be delivered on the reverse side. It was not until March 1, 1907 that the back side of the card was divided to accommodate a place for a message and the delivery address. These cards are undated, but the back of the cards, indicate that the cards are from after March 1, 1907. This information is from the Collection of Leonard A. Lauder, New York.

the nearby Harlem River Speedway, opened in 1898, as a race course for horses and buggies.[47] In this example (figure 2.13), the sender has misidentified the Washingon Bridge as the High Bridge, which would be behind the photographer in this instance. But the sentiment of the note reveals the correspondant's impression of the place.

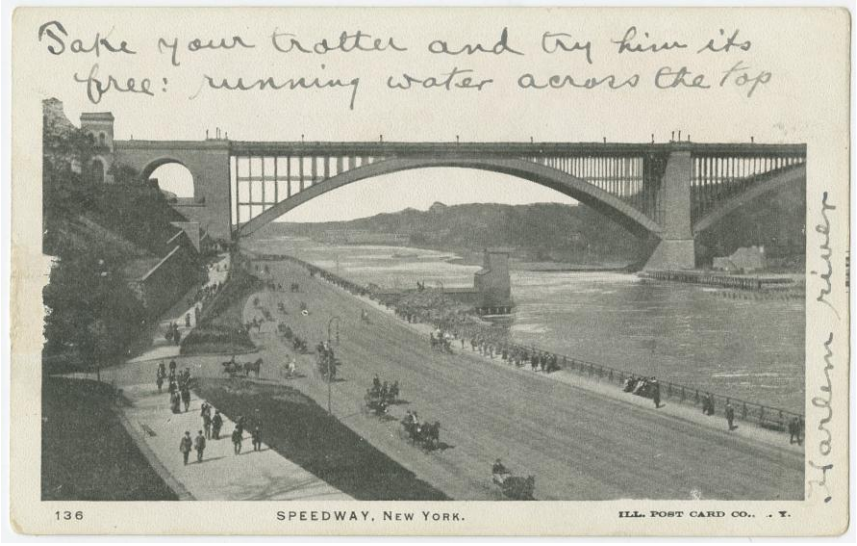

Figure 2.13: Speedway, New York, Collection of Leonard A. Lauder, New York.

The recreational comes first: "Take your trotter and try him, it's free…" but, the writer has understood that the High Bridge is an aqueduct, when he/she writes "running water across the top." The High Bridge was a recreational destination with no admission charge, where one can see running water and participate in public infrastructure open to all. Walking across the bridge, racing horses on the speedway, taking cruises on the river, and rowing competitions for crew

[47] New York City Parks and Recreation website, accessed December 27, 2011, http://www.nycgovparks.org/park-features/northern-manhattan-parks/high-bridge-coalition/harlem-river-waterfront

boats were each popular activities connected to the High Bridge.[48] As people spent their leisure time at the High Bridge and as it became codified as a tourist destination in the visual record, such visibility raised awareness of the bridge's important role as aqueduct built by the city, thereby reinforcing the notion of public water and strengthening public acknowledgment of water as a public resource. The High Bridge and its environs came to be seen as a great public park with great public works at its center.[49]

Show and Tell: Building the New Croton Aqueduct

Ultimately, the Croton Aqueduct and its dramatic High Bridge would not be able to supply the city with enough water. The city would need to find new sources to provide more water to its growing population. It would take a major national drought to prompt the city to action. In the early 1880s, it became clear that the current supply of water arriving from the Croton watershed, even with the expansion of the system in the 1860s, was not going to be sufficient for the city's needs. To truly increase the capacity of New York's water system, new infrastructure needed to be built. But, the city did not act on this initiative until the severe drought of 1881 highlighted the inadequacy of the water supply of the city.[50] The summer of 1881 was remarkably dry. The national drought, which left the "whole country parched and literally burning up," lasted into the fall.[51] In October, *the New York Times* reported that this devastating drought had "covered a vast amount of territory… (reaching) the means of every

[48] New York City Parks and Recreation website, accessed December 27, 2011, http://www.nycgovparks.org/park-features/northern-manhattan-parks/high-bridge-coalition/harlem-river-waterfront
[49] Records on numbers of visitors and attendance to the High Bridge in the 1890s are not available. Email exchange with Karen Murphy, Department of Environmental Protection Archivist, September 13, 2011. The High Bridge still exists today and the High Bridge Coalition has recently secured city approval to restore the bridge and reopen it to pedestrians.
[50] Wegmann, Edward. *The Water Supply of New York, 1658-1895* (New York: J. Wiley & Sons, 1896), 108.
[51] "Thirsting for Rain," The Washington Post, September 3, 1881,1.

citizen of the Union…"[52] This drought and the threat of a water famine prompted the city to expedite plans to increase the city's water supply.[53] The national and the local press covered the devastating drought, celebrating when the first rains finally came in November. On November 12, 1881, *Harper's Weekly* reported that the rains arrived in New York when just two weeks of water supply remained for the city. "No one can imagine the horrors to which the people of New York would have been subjected had the supply failed even for twenty-four hours, to say nothing of the terrible disasters which would have ensued had fires broken out in the city."[54] Given the dramatic reduction in water supply because of the drought, the city was forced to decrease the flow of water into the city mains even further, by shutting down the Central Park Reservoir gates, as illustrated in this engraving (figure 2.14).

[52] "The Drought of 1881," *The New York Times*, October 21, 1881, 4.
[53] "Public Works in New York City," *Scientific American*, March 4, 1882, 137.
[54] "Shutting Off the Croton," *Harper's Weekly,* November 12, 1881.

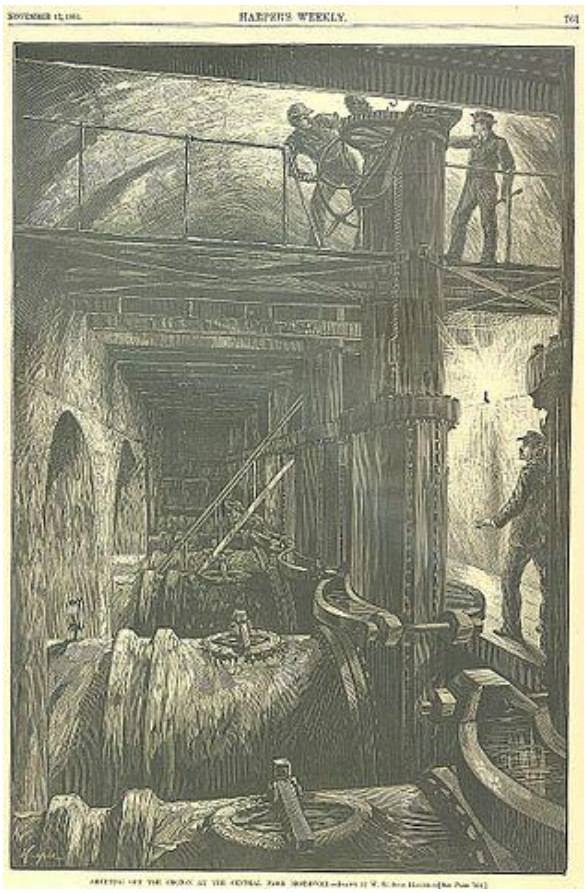

Figure 2.14: Shutting Off the Croton at the Central Park Reservoir, *Harper's Weekly,* November 12, 1881.

"What happened last summer may happen again," *Harper's Weekly* continued, "and effective measures should be taken at once to prevent a worse disaster in the future."[55] One month later, with the drought over, *Harper's Weekly* chided Americans for their "happy go lucky" temperament that allowed them to forget the recent fears of a water famine. "The copious and welcome rains of the autumn have washed away our fears, but the fact nevertheless remains that the arrangements of the water supply for the city are inadequate."[56] The magazine reported that for three months starting in July, the flow of Croton water had decreased from 95,000,000 gallons per day to less than 10,000,000 gallons per day. Additional reservoirs and a new

[55] "Shutting Off the Croton," *Harper's Weekly,* November 12, 1881
[56] "How To Take a Hint," *Harper's Weekly*, December 10, 1881.

aqueduct were necessary. "Public works, indeed, involves great and costly jobbery; but this is a vital public necessity…(which) should be made real without delay," declared *Harper's Weekly*.[57]

The city began to plan the New Croton Aqueduct, the largest public water infrastructure project to date. This aqueduct was an important step along the trajectory toward public water because city bureaucrats began to behave in ways that came to represent a government approach to public water. First, the mayor's office began to allow for more citizen involvement in the new project and for greater transparency about finances. He addressed the finances frequently and publicly in order to quell Tweed-inspired fears of fiduciary mismanagement. Second, engineers allowed journalists to visit construction sites. Detailed press coverage of the New Croton Aqueduct raised public awareness about the massive building projects and the large-scale planning required to expand public water. Lastly, the city began issuing written reports on the work and using photography to create a visual record to document the progress of the construction.

On April 11, 1881, Isaac Newton, Chief Engineer of the Croton Aqueduct, had presented a report on the water supply to Commissioner of Public Works, Hubert O. Thompson. In this report, Newton called for the construction of a new aqueduct and a dam, stating that the urgency was due to the "dangerous condition" of the current aqueduct under extreme strain.[58] As we have seen, in September and October of 1881, city officials took extraordinary measures to reduce daily water consumption. Outlet gates of the reservoir in Central Park were partially closed, water was shut off from public fountains and drinking hydrants, and the sprinkling of

[57] "How To Take a Hint," *Harper's Weekly*, December 10, 1881.
[58] Wegmann, *The Water Supply of New York*, 108

streets was terminated. The Mayor and the Department of Public Works issued urgent appeals to the public to use water as sparingly as possible.[59]

In 1882, the actual daily water supply from the Croton system to the city was 95 million gallons per day. Yet New Yorkers continued to waste water. The high service district was the neighborhood which used the greatest quantity of water. Had all areas of the city used water at the same rate of consumption as the high service district, the city would have required a daily supply of 125 million gallons per day to meet this demand.[60] An article in *Frank Leslie's Popular Monthly* lambasted ignorance about the water system and the waste of water. "But the most thoughtless person is aware of a few facts," wrote this reporter, "He knows that years ago the water rose in all our houses to the upper stories while now, unless he lives in some favored district, he has to pump it, or carry it up by hand. He knows, too, that however careful he may be of the water, he has numerous neighbors who waste it wantonly and wickedly…"[61] In fact, nearly eight ninths of the water that arrived each day in New York was wasted. Water meters seemed to be the only way to curb waste of water. In one example, a Manhattan hotel was using three hundred gallons of water per day per hotel guest, until a meter was placed in the hotel. "The presence of a meter and the necessity of paying for the water consumed, in a few days cut down the consumption one-half."[62] However, since most water waste was in private homes, and these homes remained unmetered, water conservation efforts in 1881 and 1882 were largely unsuccessful. The city found itself without a solution to meet the city's increased need for water.

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[59] Wegmann, *The Water Supply of New York,* 87.
[60] "Public Works in New York City," *Scientific American,* March 4, 1882, p. 137. The high service district refers to part of the city at high elevation for which water had to be pumped in order to reach its residents. See "The New High Service Pumping Works, New York City," *Scientific American,* April 22, 1882.
[61] Douglas Campbell, "The Past, Present, and Future of New York's Water Supply," *Frank Leslie's Popular Monthly*, January 1882, vol XIII no 1. 2 -11.
[62] Douglas Campbell, "The Past, Present, and Future of New York's Water Supply," *Frank Leslie's Popular Monthly*, January 1882, vol XIII no 1. 2 -11.

Driven to act in order to supply more water, Commissioner Thompson submitted Chief Engineer Newton's proposal for new waterworks to Mayor William Grace, who sent this report to the State Legislature. On January 9, 1883, the Senate resolved that the mayor appoint a committee of five citizens to review the plans.[63] This committee was referred to as the Mayor's Water Commission. This committee supported the construction of a new aqueduct and the allocation of funds needed for this new project, yet they insisted that first an investigation be made of the amount of water supplied by the current aqueduct and of the operations of the Department of Public Works. The Mayor's Water Commission sought assurance that political patronage had not played and would not play a role in construction of the new aqueduct.[64] On March 7, 1883, the Mayor's Water Commission recommended to the Senate that the aqueduct and reservoirs be built at once and that an "unprejudiced commission selected from the best citizens of the city" oversee the work.[65] On June 1, 1883, the State Legislature passed an act to build new aqueduct, dams, and reservoirs "for the purposes of supplying the city of New York with an increased supply of pure and wholesome water."[66] This act entrusted this work to the Board of Aqueduct Commissioners, a newly created board, and mandated that the DPW execute the necessary surveys and plans.[67]

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[63] Wegmann, *The Water Supply of New York* , 109-110. The exact language of the beginning of this Senate resolution was "Whereas with the return of business prosperity the rapidly increasing growth of the city of New York causes a constant increase in the complaints which have prevailed for years past, that by the insufficiency of the city's water supply the people are deprived of the ordinary conveniences of domestic life, the public health is endangered, the security of property from fire is diminished, and the pursuit of commerce and manufactures is retarded…" The five men Mayor Edson appointed were Hon. Orlando B. Potter, John T. Agnew, William Dowd, Amos F. Eno, and Hugh N. Camp.

[64] "Leaks in the Water Fund: How Mr. Thompson Spends City Money," New York Tribune, January 25, 1883, 3.

[65] Wegmann, *The Water Supply of New York,* 110.

[66] Wegmann, *The Water Supply of New York*, 110.

[67] Originally, this board was to be composed of the Mayor, the Comptroller, the Commissioner of Public Works, ex officio, and three citizens. Each of the citizens was to be paid $8,000 per year. In 1888, a new act altered the composition of this board to be composed of the Mayor, the Comptroller, the Commissioner of Public Works, and four citizens appointed by the Mayor. Wegmann also addresses how the DPW and the Board of Aqueduct Commissioners worked together. "As the work advanced the DPW made further surveys and general plans for the

Concerns about the management of the finances for the project persisted. The Croton Water Fund would raise capital through the sale of bonds and not through taxes. Critics were most concerned about an act that dated to Boss Tweed's era that allowed the Commissioner of Public Works to "expend $1,000,000 a year, in addition to any appropriation by the Board of Estimate and Apportionment to increase the water supply."[68] The press questioned the legitimacy of payments to Tammany secretaries, lawyers, and workmen.[69] A general lack of trust prompted greater scrutiny of the bidding and the process of awarding contracts.

At a series of thirty-three public meetings held in 1883 and 1884, commissioners, engineers, and citizens discussed the work to be done to construct a new aqueduct and its financial ramifications.[70] At these public meetings, one Aqueduct Commissioner justified the need for the new aqueduct, explaining that the current aqueduct was "old, broken, and at any time liable to give way. If it should," he cautioned, "in one week, New-York City would be no city at all."[71] Building a new aqueduct was the solution to this dangerous situation. The Aqueduct Commissioners demonstrated New York's need for increased water supply by comparing the current supply with that of twelve other American cities. "The daily average consumption per capita in Washington is 176 gallons," they explained, "Jersey City 124 gallons, Chicago 114 gallons, Troy eighty-eight gallons, and New York 79 gallons."[72] According to the Commissioner of Public Works, the estimated cost of the project was $15,664,308, "based on a

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Aqueduct Commissioners as required by law. To avoid delays, however, most of the details of the new work were designed by the engineers of the Aqueduct Commissioners, in consultation with those of the DPW. These plans were then accepted by the DPW and submitted to the Aqueduct Commissioners for their final approval." Wegmann, *The Water Supply of New York,* 113-114. Galusha, *Liquid Assets,* 53-55.

[68] "Leaks in the Water Fund: How Mr. Thompson Spends City Money," *New York Tribune*, January 25, 1883, 3.

[69] "Leaks in the Water Fund: How Mr. Thompson Spends City Money," *New York Tribune*, January 25, 1883, 3.

[70] "The Size of the Aqueduct: Last Public Hearing on the Subject," January 4, 1884, New York Tribune, 8.

[71] "Plans for the Aqueduct," December 16, 1884, New York Times, 3.

[72] "The Size of the Aqueduct: Last Public Hearing on the Subject," January 4, 1884, *New York Tribune*, 8.

rate of progress of 200 feet per month."[73] The New Croton Aqueduct was to be a public undertaking with contracts to be let to private companies. The private companies would execute the construction, with protections in place in the form of government oversight.

In short order, the Board of Aqueduct Commissioners met to award the contracts.[74] The Board selected two of the contractors and chose to divide the work north of the Harlem River between them. The New Croton Dam and the section of the New Croton Aqueduct under the Harlem River were the two largest parts of the job to be contracted.[75] All appointments for any contracted labor under the Aqueduct Commission "from engineers down to chainmen," had to be examined and recommended by the Civil Service Commission.[76] For the New Croton Aqueduct, unlike previous projects, there were several apparatuses in place, such as the Civil Service Commission and the Mayor's Water Commission, to serve as a check on operations.[77]

In January 1884, the Aqueduct Commission's engineers began to collaborate with the DPW on making surveys to determine the route for the New Croton Aqueduct. By May, the project engineers were ready to stake out the route, which was then to be divided into seventeen sections, each to be contracted out. Ten of these seventeen contracts were awarded by December 13, 1884. Construction began in January of 1885. The speed with which these two agencies, the Aqueduct Commissioners and the Department of Public Works, launched this major engineering undertaking was remarkable. The remaining contracts, including those for the pressure tunnel and the siphon under the Harlem River, were awarded on January 28, 1886. Between 1887 and 1889, the city accepted and finalized bids for the work on the 135th Street Gatehouse, where the

[73] "The Cost of the New York Aqueduct," March 8, 1884, *Scientific American*, 152.
[74] "Big Contracts Awarded: Successful Bidders for the Aqueduct Work," *New York Times*, December 14, 1884, 2.
[75] "Plans for the Aqueduct," *New York Times*, December 16, 1884, 3
[76] "Plans for the Aqueduct," *New York Times*, December 16, 1884, 3
[77] See "An Outrageous Job," *New York Times*, March 25, 1886, 4.

old and new aqueduct would meet, and the Manhattan pipelines, which would connect this gatehouse to the reservoir in Central Park.[78]

The new aqueduct would deliver three times the amount of water brought by the Old Croton Aqueduct. It was to be composed of three sections, each structurally distinct. The first, running from the Croton Dam to the Jerome Park Reservoir, was a masonry and brick tunnel, constructed in rock at an average depth of 125 feet. The second, spanning from Mosholu Avenue to the Gate House at 135th Street, was seven miles long. At the Harlem River, the inverted siphon went underground through limestone to 300 feet below the surface. The third section of the aqueduct was the masonry conduit "under pressure", running to its terminus at the 135th Street Gatehouse. Three coats of Portland cement sealed the interior of this conduit. The water would then travel from the 135th Street Gate House via eight forty-eight inch cast-iron pipes, four to the Central Park receiving reservoir and four to the city's distribution system.[79]

Newspapers and periodicals tracked the progress of these new waterworks during construction.[80] Perhaps the most remarkable element of the New Croton Aqueduct was that it would run underneath the Harlem River.[81] In this contemporary illustration published in

[78] Weidner, *Water for a City,* 71-72.
[79] Wegmann, *The Water Supply of the City of New York,* 116-117, 125.
[80] See "Along the New Aqueduct," *New York Times,* October 25, 1887, 9; "Pushing the Aqueduct Under the Hudson," *New York Tribune,* January 19, 1888, 8.; "Undo the Aqueduct Deal," *New York Times,* May 8, 1888, 4.; "Blackmail or Bribery: One way of accounting for bad aqueduct work," *New York Times,* June 10, 1888, 16.; "Further time wanted," *New York Times,* August 4, 1888, 8.; "Delayed work of the Aqueduct," *New York Times,* September 1, 1899, 13; "The Harlem River Aqueduct Tunnel and its Approaches," *Scientific American,* September 14, 1889, 165.; "The New Croton Aqueduct," *Century Illustrated Magazine,* December 1889, 205.; "Through the Aqueduct," *New York Tribune,* February 9, 1890, 8 – also February, 16 1890; "New-York's Big Aqueduct," *New York Times,* July 13, 1890, 20.; "Opening the New Aqueduct," *New York Times,* July 13, 1890, 4.; "Opened at Last," *San Francisco Chronicle,* July 15, 1890, 1; "New York's Big Aqueduct," *San Francisco Chronicle,* July 15, 1890, 4.; "Illustrations from Scientific American"; "The Seven Wonders of the 19th Century," *Frank Leslie's Popular Monthly,* August 1890, 2.; "The New Croton Aqueduct – The Harlem River Siphon and Pumping Apparatus," *Scientific American*, July 19, 1890; "The Croton Aqueduct," *The American Catholic Quarterly Review*, October 1890, 803.
[81] Edward Wegmann. *The Water Supply of New York, 1658-1895.* (New York: J. Wiley & Sons, 1896), 117.The path of the aqueduct was too high at first and "the attempt of tunneling under the river at this level had to be

Scientific American (figure 2.15), we see the High Bridge across the Harlem River between the Bronx and Manhattan in the background and in the foreground we see a cross-section of the Harlem River with the tunnel of the New Croton

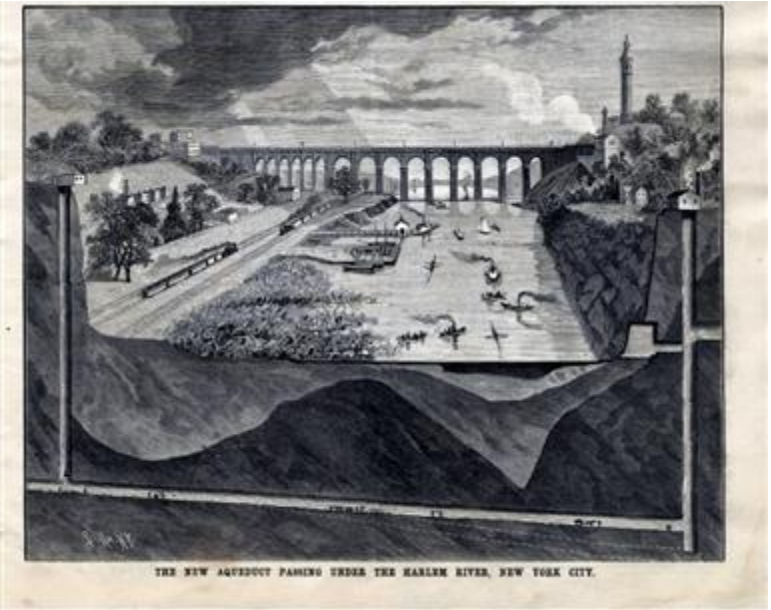


Figure 2.15: New Aqueduct Passing Under the Harlem River, New York City, *Scientific American*, September 25, 1886.

Aqueduct dug underground. This image highlighted the contrast between the old and new, an observation echoed by another report in the publication that declared: "We have here, within a half mile, the two most wonderful examples of conducting water across a river – one forming the most conspicuous and attractive object in a naturally beautiful region; the other forming the safer conveyer, far beyond the reach of any efforts that might be made to destroy it, and as durable as the solid rock in which it is buried."[82] The tunnel as a technological wonder drew reporters to the site. Journalists accompanied Aqueduct Commissioners and engineers into the tunnels

abandoned and the aqueduct was therefore lowered 172 feet by means of a short tunnel and a vertical shaft, sunk in the tunnel as a continuation of shaft 24, but located about 35 feet from its axis."

[82] "The Aqueduct Under the Harlem River," *Scientific American*, June 12, 1886, 367.

during their periodic inspections and recorded their experiences underground for their reading public.[83]

Similarly, the city began issuing written reports on the project and using photography to create a visual record to document the progress. Workers dug the sinking shafts and removed the muck from these shafts via pulley carts. The New York City and Northern Railroad hauled brick and cement for the project.[84] The most difficult section to construct was a 110 foot section of tunnel that took ninety-two weeks to complete because it required tunneling through 160 feet of mud.[85] After 1886, workers had the benefit of electric light in the tunnels. No longer having to tolerate working by candlelight proved a tremendous improvement to working conditions.

Official photographers took hundreds of interior views, which were made possible by the new technology of the camera flash. In this photograph from *The Aqueduct Commissioners' Report* (figure 2.16), we see three workers sitting in their workspace now illuminated with electric lights rather than candles for the first time. In this image (figure 2.17), we see several workers posing for the picture in one of the vertical shafts of the new aqueduct. Both photograph document the physical and logistical challenges of this work underground on the new aqueduct.

[83] Along the New Aqueduct," *New York Times*, October 25, 1887, 9.
[84] Diane Galusha, *Liquid Assets: A History of New York City's Water System*. (Fleischmanns: Purple Mountain Press, 2002), 64-65.
[85] *City of New York Aqueduct Commissioner: Report on the New Croton Aqueduct, Reservoirs, and Dams: 1895-1907.*

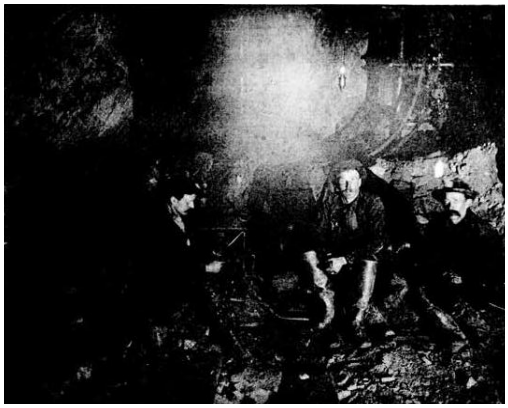


Figure 2.16: In the Tunnel Heading by Electric Light, Photograph from *City of New York Aqueduct Commissioner: Report on the New Croton Aqueduct, Reservoirs, and Dams: 1883-1887*, New York City Department of Environmental Protection Archive. Courtesy of DEP Archive.

Figure 2.17: Excavating Shaft # 26, Photograph from *City of New York Aqueduct Commissioner: Report on the New Croton Aqueduct, Reservoirs, and Dams: 1895-1907*, New York City Department of Environmental Protection Archive. Courtesy of DEP Archive.

These arresting images comprised of portraits of individual workers and group shots in the construction sites are unmatched in their ability to render a portrayal of engineers' and workers' involvement in the construction of the New Croton system. Photographs such as these two were taken for documentary purposes, for lawsuit prevention, and to keep an eye on contractors, some

of whom did shoddy work. Often, this sub-standard work would continue until it was investigated and exposed in a public scandal, as was the case in 1888 when numerous defects were found in the tunnel.[86] The Aqueduct Commission employed professional photographers and their photographs provided the evidence in this instance.[87]

The Aqueduct Commission was part of larger trend in post-Civil War America when photography became the medium of choice, especially for corporations to document their work and to demonstrate good business practices. Although some of these photographs were published in engineer Edward Wegmann's book of 1896 and some were included in the Aqueduct Commission's official reports where engineers would see them, as far as can be determined from the sources, these photographs were not released to the press where the general public could have seen them.[88] Not for public consumption, these photographs were taken for documentary purposes to record the progress on this massive construction project and they have become part of a larger visualization of urban infrastructure.

In 1890, the New Croton Aqueduct was put into service. By July 15, 1890, water from Croton Lake flowed through the new aqueduct to the Central Park reservoir. On June 24, 1891, the Aqueduct Commission turned the New Croton Aqueduct over to the Department of Public

[86] Charles H. Weidner. *Water for a City: A History of New York City's Problem from the Beginning to the Delaware River System* (New Brunswick: Rutgers University Press, 1974), 74-75.
[87] While these photographs comprise a visually arresting collection of images, we need to be careful not to assign an artistic value with our twenty-first century eye to these photographs. It is tempting for us to see them as works of art for they use composition and light and photography is an emerging art and practice at this moment. But it is most likely the case that the general public did not have the opportunity to view these photographs at the time when they were taken, as the photographs were taken just for record keeping purposes. When contemplating the meaning of photographs, it is essential to remember that photographs may have meant something different at the time they were originally taken and seen then than they do now. For more on this idea, see Peter Bacon Hale, *Silver Cities: Photographing American Urbanization, 1839-1939* (Albuquerque: University of New Mexico Press, 2006), 132.
[88] Bone, *Waterworks*, 106-178.

Works.[89] The New Croton Aqueduct was built at a time of very different circumstances from the Old Croton system. Since the New Croton Aqueduct was mostly underground, it did not have a showpiece like the High Bridge, but engineers took care to design a dramatic gatehouse at 135th Street (figure 2.18), where the Old Croton and the New Croton Aqueducts connected. A

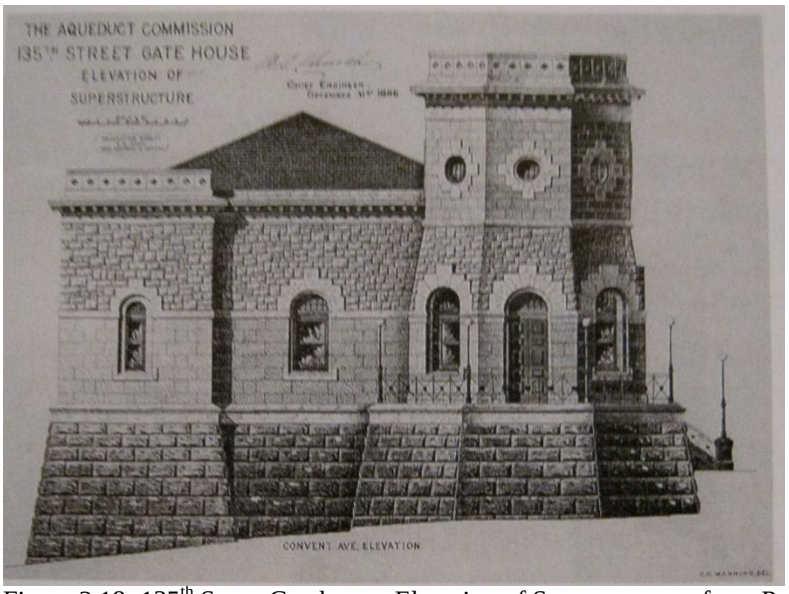
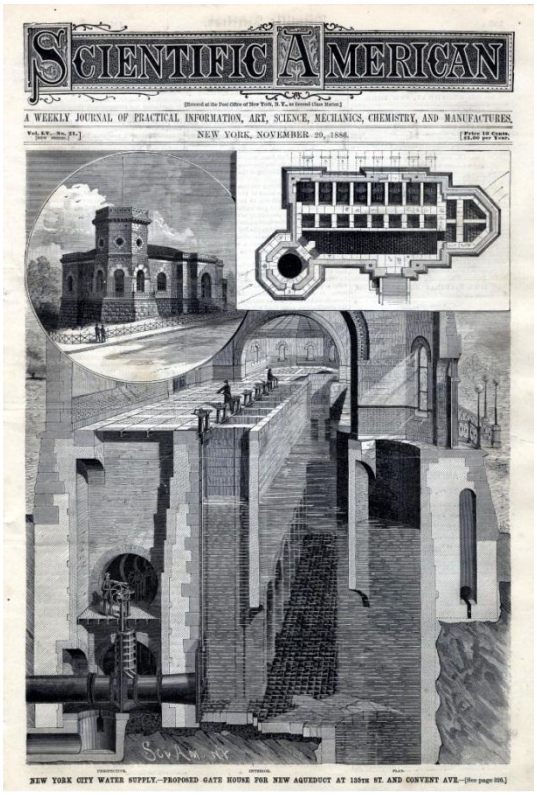


Figure 2.18: 135th Street Gatehouse, Elevation of Superstructure, from *Report to the Aqueduct Commissioners,* 1887.

drawing of the new gatehouse appeared on the cover of *Scientific American* in November, 1886 (figure 2.19).

[89] Wegmann, *The Water Supply of New York,* 115. The next step after the aqueduct was to create additional storage. Construction of the reservoir on the East Branch of Croton began in 1888. Construction of two more reservoirs, one on the Titicus River near Purdy's and one on the west branch of Croton near Carmel in 1890.


SCIENTIFIC AMERICAN

A WEEKLY JOURNAL OF PRACTICAL INFORMATION, ART, SCIENCE, MECHANICS, CHEMISTRY, AND MANUFACTURES.

NEW YORK, NOVEMBER 20, 1886.

NEW YORK CITY WATER SUPPLY.—PROPOSED GATE HOUSE FOR NEW AQUEDUCT AT 135TH ST. AND CONVENT AVE.

Figure 2.19: 135th Street Gatehouse, drawing, *Scientific American,* November 20, 1886.

Designed by Frederick S. Cook in a Romanesque revival architectural style, the gatehouse was completed in 1890. Its imposing design commanded attention with a dramatic tower that was purely decorative.[90] Unlike the Murray Hill Reservoir and the High Bridge of the Old Croton system, the new infrastructure of the New Croton Aqueduct could not be seen, so this gatehouse was designed to showcase the joining of the Old Croton system with the new Croton system with its imposing architectural design and presence.

[90] Galusha, *Liquid Assets,* 65-66.

Conclusion

The New Croton Aqueduct and the High Bridge captured the public's attention and became part of a culture around public water. Rituals, such as celebratory openings of new aqueducts, unveilings of fountains to commemorate accomplishments in water infrastructure, and sight-seeing excursions to the High Bridge, raised public awareness around water and highlighted the centrality of water to urban life. The general public began to see public water as a great public work. The popular culture that arose around the High Bridge as a recreational destination served to increase public awareness of the importance of water. The general public's participating in this site meant that the High Bridge belonged to everyone. The press coverage of people visiting the High Bridge helped to construct a public history of water, which became part of the justification for the permanent public management of water.

Scholar Setha Low has contemplated how spatial meanings are manipulated by the city to represent economic agendas. In her work, she explores how these agendas then become part of the architectural design of public space thereby providing a locale for public involvement.[91] As water moved gradually toward becoming a solely public utility in New York City, engineers and planners made deliberate choices to construct visually stimulating structures for water infrastructure, as was the case with the High Bridge and the Murray Hill Reservoir. In turn, these dramatic sites generated attention from the general public, thereby bringing greater awareness to and appreciation for how water was supplied and distributed. The tourist culture, which evolved around New York's aqueducts and reservoirs, was then reinforced by the

[91] Setha M. Low, *On the Plaza: The Politics of Public Space and Culture.* (Austin: University of Texas Press, 2000), 239.

reproduction of images of these structures in stereographs and postcards, creating a vast visual record.

By merging function and form, utility and aesthetics, city engineers sought to cultivate greater public awareness of the significance of water infrastructure and to establish it with an enduring public presence. In the bold architectural choices for water infrastructure, we see an assertion of power through representation, such as in the High Bridge and the 135th Street Gatehouse. This gatehouse was a visible monument to the otherwise invisible technological advances of that infrastructure. These structures claimed a permanent place in the urban landscape through their striking visual appearance. They were built to last, both functionally and as a testament to the power of municipal ownership of water. The intentional visibility of the City of New York's early waterworks raised awareness of this public water system and was in keeping with the monumental public structures of this period. Visiting, viewing, and enjoying city-built infrastructure served to reinforce the publicity of water and its primacy as a city resource in the minds of New Yorkers. The architecture of government-built water infrastructure became visual signage for public water.

Building on this tradition of visibility, city officials strove, as water infrastructure moved underground, to make the invisible visible. In the New Croton system, which was mainly underground, there were no grand showpieces, so the 135th Street Gatehouse physically represented the visible technological advance of city water resources. But the visible took other forms. When planning and building the New Croton Aqueduct, city officials established water in public terms by being transparent about finances, by documenting progress, and by seeking the participation of the public in the project. Scholars have noted that this notion of "publicity," that public affairs should be conducted in public and as a check on public corruption, became

prominent in late nineteenth and early twentieth century America.[92] Efforts to ensure that the government was accountable and was acting in the public interest became important in public water management in New York. In some ways, the completion of the New Croton Aqueduct in 1890 marked end of the period of visibility of public water infrastructure; subsequently water could go underground because people knew about public water from their familiarity with infrastructure from the Old Croton system, especially the High Bridge, and because the public structure running it was becoming more transparent.

What is most important here is the shift when people started to think of water as public. People participated in public water during their strolls along the High Bridge and they read about the New Croton Aqueduct and its finances in the newspapers. New Yorkers began to see and experience the infrastructure that brought water to New York. Scholar Bruce Robbins argues that infrastructure needs to be made visible "in order to see how our present landscape is the product of past projects, past struggles, past corruption…as a guide to the struggles of the present."[93] This notion of visibility is central to water supply and to the popular culture created around it in nineteenth century New York. For water to become effectively visible, its distribution and transport points, be they fountains or reservoirs or aqueducts, had to be visually arresting, especially in the later nineteenth century, in order to compete with an increasing visually-dense urban landscape.

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[92] Jody Freeman an Martha Minow, editors, *Government By Contract: Outsourcing and American Democracy*, (Cambridge: Harvard University Press, 2009), 38. See Novak, "From the important role of the jury in legal governance to the recruitment of ordinary citizens for routine public service, 19th c Am government was visible, accessible and almost tangible in every day life…This overriding concern with publicity – with political power as essentially non private and open to the public, as visible rather than hidden, and a subject to public scrutiny, checks and remedies – has been at the center of the American governmental experiment since its founding."

[93] Bruce Robbins, "The Smell of Infrastructure: Notes Towards an Archive," boundary 2 34:1 (Spring 2007): 25-33.

However, this increased visibility of water and the display of abundance after Croton may have contributed to the waste of water. As water drifted toward public management, public attitudes towards water shifted as people began to take it for granted, to assume that supply would be infinite, and to behave as if it were provided free of charge. For instance, the uneven roll-out of metering system for private homes led to water waste.

In the case of the charitable water fountains, immigrants did not pay for water, but the sponsoring private charity did, usually through donations. As we have seen, the Judson Memorial Church and other charities provided the city's poor with a clean source of drinking water.

> "When my child was sick, and I that poor I couldn't buy ice, and the child cried for a cooling drink, didn't I go in the middle of the night and draw water just as cool and fresh as it was in the middle of the day? I wouldn't have known what to do without it…"[94]

According to a Judson Memorial Church publication, a neighborhood woman in 1900 spoke these words, referring to one of the church-run water fountains near Washington Square in Greenwich Village. As this quotation shows, both sickness and poverty were factors that contributed to the need for water, a need that remained unmet by the city.

Increased demand for water, demonstrated by the poor's high rate of use of the drinking water fountains operated by private charities in the 1890s, indicated that the city would need to further expand the water system beyond its existing infrastructure in 1890 in order to assure adequate access to drinking water for all city residents. Disease prevention and sanitation were central tenets of the nascent public health field and strong, although sporadic, motivators for the

[94] *Imagine Greenwich Village without Judson Memorial Church*, Centennial Brochure, 1990. Judson Memorial Church Archive, MSS 94, Fales Library and Special Collections, New York University.

transition to the public management of water in the 1890s. It is to sanitation and disease prevention and their connection to public water that we turn in the following chapter.

CHAPTER 3: Sanitation and the State, 1890-1898

Bringing the New Croton Aqueduct into service in 1890 began to address issues of insufficient water quantity in the City of New York, however, water quality was also becoming a pressing issue in the late 1880s and 1890s. The Croton watershed was more densely populated since the days of the Old Croton Aqueduct, which meant that the purity of Croton water became harder to guarantee. By the late 1880s, a population of 20,000 inhabited the two hundred and thirty-nine square miles of the Croton watershed, living in 1,879 dwellings, and utilizing numerous cesspools, cemeteries, barns, pig-pens, privies, and slaughter houses, all potential sources of water contamination. No drainage system existed in the watershed, except on the surface. Locals routinely disposed of waste directly into the river tributaries.[1] Sanitation and the removal of filth in the Croton watershed would become an essential city effort at the end of the nineteenth century.

Popular belief had held for years that running water purified itself. In an 1888 publication, *A Treatise on Beverages,* chemist Charles Herman Sulz sought to debunk this myth by citing the example of typhoid, which had "been conveyed twenty-five miles by a river and communicated to forty hospital patients who drank its waters."[2] Sulz argued that the introduction of public water works "almost invariably leads to a diminished death-rate from zymotic disease…"[3] yet increased sources of pollution near water sources could undermine this progress. A more accurate scientific understanding of connection between contaminated water and disease underlay Sulz's treatise on water as a beverage. He organized this discussion of water by type according to its source to include rain water, pond water, spring water, well water,

[1] Charles Herman Sulz, *A Treatise On Beverages Or The Complete Practical Bottler; Full Instructions for Laboratory Work with Original Practical Recipes for All Kinds of Carbonated Drinks, Mineral Waters, Flavorings Extracts, Syrups, etc.* (New York: Dick & Fitzgerald Publishers, 1888), 47.
[2] Sulz, *A Treatise On Beverages,* 48.
[3] Sulz, *A Treatise On Beverages,* 48.

river water, sea water, and Croton water. He explained that the Metropolitan Board of Health had prohibited the use of well water in 1884, due to concerns about decaying animal matter and other pollutants entering well water. He then engaged in a lengthy discussion of Croton water. While his overall take was that Croton water was of good quality, he expressed concerns about the future safety of Croton water, stating that it contained "suspicious organisms," the elimination of which required filtration. His book included an illustration of the germs found in Croton water (figure 3.1) with detailed analysis of the types of bacteria and sponges which he had identified. As a short-term solution, Sulz recommended filtering the water through a cotton cloth and then boiling the water and letting it cool before drinking.[4]

Figure 3.1: Organisms in Croton Water, Charles Herman Sulz, *A Treatise on Beverages*, 1888, accessed August 13, 2012, http://chestofbooks.com/food/beverages/A-Treatise-On-Beverages/Pelomyxas-I-T-I.html.

By way of example, Sulz explained that the State Board of Health of Massachusetts declared that the practice of boiling water was the only guaranteed method to destroy any "germs of disease" from sewage present in drinking water. He maintained that filtration could be a more practical proposed solution. He argued that the government should take over the filtering of water since

[4] Sulz, *A Treatise On Beverages*, 6-10.

this would benefit both rich and poor and there would be no need to rely on "untrustworthy domestics" to perform this function.[5] New York's government did not take action on water filtering.[6] However, city officials did begin to increase involvement in assuring water purity and this undertaking meant expanding their reach beyond the city limits to the watershed upstate as part of the city's evolving role in public health.

In many ways, this effort was an extension of the miasma-based solution of removing filth, more than a reaction to the evolving germ theories about water borne disease. The image of Croton water from Sulz's book is oddly reminiscent of a much earlier image of Thames water in London (figure 3.2). In this image from 1828, a woman peering through a microscope discovers the monsters, which inhabit Thames drinking water, causing her to drop her teacup in disgust. This image predates the scientific discovery of germ theory displayed in Sulz's image

Figure 3.2: A woman dropping her tea-cup in horror upon discovering the monstrous contents of a magnified drop of Thames water revealing the impurity of London drinking water, 1828. World Digital Library, accessed September 15, 2011, http://www.wdl.org/en/item/3956/?ql=eng&s=tea-cup&view_type=gallery.

[5] Sulz, *A Treatise On Beverages*, 48.
[6] In fact, New York's water remains unfiltered to this day, although filtration plants are currently under construction.

by decades but, it expresses a deep fear about impurities in water. The 1828 image confirms that concerns about water purity were long-standing.

Medicine and public health during the late nineteenth century were characterized by the existence of multiple and different theories of disease transmission which coexisted and complemented each other. The new germ theory did not all at once replace miasma. The early understanding of germ theory arose from, and was indebted to, "sanitary science, which stressed the ubiquity of airborne infection and the disease-causing properties of human wastes and organic decay."[7] Disease transmission theories included the "miasmatic, diffusible through air or water,…contagion, communicated person to person by contact,…dietetic, arising in the blood from poor diet or bad food,… parasitic, animal and plant organisms infesting the …body."[8] Miasmists or anti-contagionists, as they were also called, supported sanitary science, which advocated for the removal of filth from human contact and the regulation of public nuisances. Public nuisances included "manure piles, slaughter houses, dairies, stables, burial grounds, obnoxious trades, overflowing privies, cesspools, stagnant pools, filthy gutters, and a wide range of annoyances which were offensive to the nose and the eye."[9] The anti-contagionist stance against contagious theory of disease was a strong one, arguing that it failed to explain the recurrence of disease in certain neighborhoods and seasons or how nurses and doctors in hospitals that were managed well did not become ill when caring for the sick.[10]

This chapter traces the increasing government involvement in sanitation and water management for disease prevention, which began to crystallize in New York in the 1890s. The

[7] Nancy Tomes, *The Gospel of Germs: Men, Women, and the Microbe in American* Life (Cambridge: Harvard University Press, 1998), 8.
[8] John M. Eyler, *Victorian Social Medicine: The Ideas and Methods of William Farr* (Baltimore: The Johns Hopkins University Press, 1979), 36-37. These terms are from William Farr's classification in the 16th Annual Report of the Registrar General for 1854.
[9] John Duffy, *A History of Public Health in New York City, 1625-1866* (New York: Russell Sage Foundation, 1968), 376.
[10] Eyler, *Victorian Social Medicine,* 37.

cholera scare of 1892 played a decisive role of spurring the city to action to prevent pollution from entering the drinking water supply. This chapter explores the impact of the city's aggressive enforcement of sanitation measures on its authority over water. A brief overview of discovery of the cause of cholera and the evolution of various germ theories provides some necessary context. Cholera was first determined to be a water-borne disease in London in the mid-nineteenth century, although wide-reaching acceptance of this discovery took many years to occur.

Cholera as Waterborne: London's Contribution

In the mid-nineteenth century, the miasma theory of disease transmission guided the decisions of many politicians, physicians, and public health officials.[11] Attorney Sir Edwin Chadwick was a chief proponent of the miasma theory. In his 1846 testimony at a parliamentary investigation of London's sewer system, he stated "… all smell is disease."[12] In 1848, Chadwick became the head of the General Board of Health and helped to pass the "cholera bill," which mandated that all buildings utilize sewer connections for waste removal.[13]

Compliance with this law, however, required a functional sewer system well beyond London's primitive system, which had been designed to remove surface water and not to replace city cesspools.[14] Cesspools near residences were receptacles for discarded water and human

[11] Steven Johnson, *The Ghost Map: The Story of London's Most Terrifying Epidemic – and How it Changed Science, Cities, and the Modern World* (New York: Riverhead Books, 2006), 186-187.
[12] Johnson, *The Ghost Map,* 114.
[13] Johnson, *The Ghost Map,* 117-118.
[14] Johnson, *The Ghost Map,* 119.

waste, which was slowly absorbed into the ground.[15] When cesspools overflowed, citizens called upon the night-soil men employed by the city to remove such unpleasantries.[16]

Chadwick's determination to remove human waste from residential areas led him to his plan to eliminate cesspools by emptying raw sewage into the Thames.[17] Although he believed he was acting in the public good, Chadwick's dumping of waste into the Thames proved deadly for the residents of London.[18] Since the Thames remained a source for drinking water, cholera returned to London in 1848 and 1849, killing approximately 15,000 residents. Tragically, the public health authority succeeded in poisoning the drinking water and killing the residents it had set out to protect.[19]

On August 28, 1854, a baby girl living at 40 Broad Street in London became ill with cholera. Her mother cleaned her diapers in a bucket and then disposed of the water by dumping it into a cesspool at the edge of her building. This cesspool then leaked into the neighborhood well, drawn on as drinking water by residents through the Broad Street pump. It took only a week for more than five hundred people in this neighborhood to die of cholera.[20] Dr. John Snow and Reverend Henry Whitehead worked together to identify and confirm the causal link between contaminated water and the transmission of cholera. Their collaboration drove them to remove the handle of the Broad Street water pump, thereby blocking access to the contaminated water and prevented another cholera outbreak.[21] In his monograph, *On the Mode of Communication of*

[15] Robert D. Morris, *The Blue Death: Disease, Disaster, and the Water We Drink* (New York: Harper Collins, 2007), 38.
[16] Johnson, *The Ghost Map,* 119.
[17] For an excellent discussion of Chadwick, sewers, and public health, see Christopher Hamlin, *Public Health and Social Justice in the Age of Chadwick: Britain, 1800-1854* (Cambridge University Press, 1998).
[18] Morris, *The Blue Death*, 48-50.
[19] Johnson, *The Ghost Map,* 120.
[20] Johnson, *The Ghost Map,* 160.
[21] Johnson, *The Ghost Map,* 160.

Cholera, published in 1854, Snow presented his evidence about water as a transmission agent of disease.[22]

Despite Snow's work, the miasma theory persisted for decades. In 1883, Robert Koch, the director of a German scientific commission based in Egypt, discovered the bacteria that causes cholera and determined that it could enter the digestive system. This discovery led to the understanding that uncooked fruit and vegetables were possible vectors of the disease and that the major outbreaks were caused by sewage-contaminated water supplies.[23] It was not until Koch succeeded in isolating *Vibrio cholera* that germ etiology of cholera became legitimized.[24] Thirty years had elapsed since Snow's discovery at the Broad Street pump before Koch's germ theory began to receive some recognition. More importantly, miasma theory would persist throughout the nineteenth century.

The global cholera epidemics of 1832, 1834, and 1849 prompted politicians and medical professionals to establish the International Sanitary Conference, which met in 1851, 1859, 1866, 1874, and 1892 to focus on cholera.[25] Some conference attendees sought standardized international quarantine procedures while others argued for the establishment of national health agencies. Nations wanted international trade to continue, but their governments needed to protect their boundaries by controlling cholera, plague, and yellow fever. In the 1880s and 1890s, the lack of international consensus about the cause of disease made the negotiations at the

[22]John Snow, *On the Mode of Communication of Cholera* (London: John Churchill, 1855).
[23] Charles E. Rosenberg, *The Cholera Years, the US in 1832, 1849, and 1866.* (Chicago: University of Chicago Press, 1962), 3-4.
[24] Johnson, *The Ghost Map*, 213. Morris, *The Blue Death*, 129-130. Morris's book contains a riveting account of the two teams, Pasteur's from France and Koch's from Germany, at work in Egypt and Calcutta on the cause of cholera.
[25] Alexandra Minna Stern and Howard Markel. "International Efforts to Control Infectious Disease, 1851 to the Present." *Journal of the American Medical Association*, 292, 12 (2004).

International Sanitary Conferences difficult.[26] The late nineteenth century was a confusing time for science. Theories inconsistent with each other were simultaneously supported. The terms "germ" and "miasm" were used interchangeably and the boundary between contagionist and anti-contagionist became blurred. [27]

New York had encountered cholera before. The response had been sanitation, as depicted in this drawing from 1885 (figure 3.3). In this image, the angel of cleanliness

[26] In the 1880s, before germ theory, information on preventing cholera, although not always scientifically sound, was more widely disseminated. An article outlining Florence Nightingale's recommendations for the prevention of cholera appeared in the *Manchester Guardian* on August 9, 1884. "Set your house in order, in all ways sanitary and hygienic," the famous nurse declared. Nightingale lamented the misinformation, which led people to believe "that you can take cholera by taking a railway ticket." She sent the newspaper what she thought was the best written source at the time, "Sanitary Lessons of Indian Epidemics," by the Sanitary Commissioner with the government of India, Dr. Cunningham. "The real danger to be feared," she opined, "is in blaming somebody else and not our own selves for such an epidemic visitation."(See "Florence Nightingale on the Prevention of Cholera," *The Manchester Guardian*, August 9, 1884, 9). Another article relayed a new municipal law in the US (in this case San Francisco was copying New York) that prohibited the use of "taps, faucets, tanks, or fountains composed of brass, copper, or lead, in drawing beer or soda water" as a precaution for cholera. It was claimed that someone had been seized with "violent pains after drinking a glass of soda water from a chemists fountain and exhibited alarming symptoms of what was called cholera morbus." But the new law was regarded as unenforceable. One official commented, "I would consider it a dead-letter, like many other of our municipal laws." (See "The Prohibited Taps," *San Francisco Chronicle*, November 22, 1884, 2).

[27] Stern and Markel, "International Efforts to Control Infectious Disease, 1851 to the Present."

Figure 3.3: At the Gates: Our Safety Depends Upon Official Vigilance, *Harper's Weekly*, September 5, 1885

with a boundary marked "quarantine" at her feet protects the Port of New York from cholera, yellow fever, and small pox. Here we see how "official vigilance" was to prevent the spread of disease in miasmatic view. Although the 1892 cholera scare was technically after the development of germ theory in 1883, the idea of miasma was so well entrenched that it was easy to incorporate water into it. Some medical professional and public health officials believed that cholera was water-borne, while others continued to support the miasma theory and sanitary science as a rationale for removing pollution from the Croton watershed to prevent disease. Either way, assuring water purity was part of the solution to the problem of cholera.

Preventing Cholera in New York in 1892

In 1892, cholera struck Hamburg, Germany with a vengeance.[28] In August, the Mayor of New York issued a proclamation, which demanded that all city offices and citizens cooperate with the Metropolitan Board of Health to improve sanitary conditions in order to prevent an outbreak of cholera in keeping with miasmatic approach.[29] Inspection of the water supply was

[28] For the seminal study of the 1892 cholera outbreak in Hamburg, see Richard Evans, *Death in Hamburg: Society and Politics in the Cholera Years, 1830-1910* (New York: Penguin, 2005).

[29]Distinguishing between city and state health boards is necessary, but complicated. The city entity, established in 1866, was called the Metropolitan Board of Health whereas the state entity, created in 1880, was called the State Board of Health. Before the 1860s, ad-hoc boards of health were convened as needed by the State Legislature, most often in reaction to epidemics. In 1807, for example, New York State passed a law, which allowed the Common Council to appoint a Board of Health. This board, comprised of the Mayor, the Commissioners of the State Quarantine Office, a Recorder, and five additional members, would be charged with determining the course of action in the case of an outbreak of epidemic disease. The board was not terribly efficient or effective. In 1866, however, New Yorkers witnessed the establishment of a permanent, central apparatus for public health with the founding of the Metropolitan Board of Health. When London's General Board of Health was formed in 1848, Chadwick as a lawyer had collaborated with a medical doctor, Southwood Smith, who was a strong supported of miasma theory. This same combination of expertise emerged in the New York context. Dorman B. Eaton, a lawyer, and Stephen Smith, a doctor, together drafted the bill to create Metropolitan Board of Health. With Eaton serving as counsel, the Metropolitan Board of Health was composed of a president, to be appointed by the Mayor, four doctors called Sanitary Commissioners, four police commissioners, and a Health Officer of Port of New York. Under the Act of 1866, the Metropolitan Board of Health would oversee the sanitary district of the counties of New York, Westchester, Richmond, Kings, and the towns of Newtown, Flushing, and Jamaica. In 1868, the Metropolitan

first on the agenda, followed by street cleaning, the inspection of food and milk, and surveying the sanitary conditions of the tenements. The Board of Health disseminated information on the prevention of cholera, namely boiling drinking water and avoiding uncooked foods, in multiple languages, including English, German, French, Spanish, Italian, and Hebrew.[30] Articles on the importance of clean water and public health proliferated in the press.[31] Concerns about the purity of Croton water continued to surface. "Just now the City of New York is receiving a sharp warning on the importance of cleanliness of its streets, perfection of its drainage system, and the purity of its water supply through the menace of contagion having its origin in filthy communities thousands of miles away," *The New York Times* reported on September 3, 1892. "There is no doubt that if cholera should get into the city its spread would be facilitated and ravages intensified by bad sanitary conditions and in this respect there is no more dangerous factor than polluted water."[32] Another article cautioned, "see that …drinking water is pure, particularly that it has not been drawn from or polluted by any sewer or sink or river that is or

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Board of Health commenced its food and drug unit, appointing Professor Charles Chandler to head up this new effort. One of Chandler's initial discoveries in his new post was the fact that many dairy vendors were diluting milk with water, resulting in contaminated milk, which caused infection in milk drinkers. In 1870, the district of the Board's jurisdiction was reduced to include only Manhattan and the Bronx and the Board added two more bureaus, the Bureau of Street Cleaning and the Bureau of Sanitary Permits. In 1880, the State Board of Health was established. An 1885 legislative act ruled that the State Board of Health was to prevent contamination of the water supply. This tension between city and state over shared responsibility for protecting the water supply will be addressed further later in this chapter. (See Weinstein, Israel "Eighty Years of Public Health in New York City." *Journal of Urban Health: Bulletin of the New York Academy of Medicine*, 77 (2000): 121- 136. Reprinted from: 23(1947): 221-237).

[30] C.E.A. Winslow, *The Life of Hermann M. Biggs, M.D., D.Sc., L.L.D.: Physician and Statesman of the Public Health* (Philadelphia: Lea & Febiger, 1929), 94-95.

[31] See T. Mitchell Prudden "Glimpses of the Bacteria," *Harpers*, April 1891; "Sterilization of Water by Heat," *Scientific American*, July 9, 1892, 22; "Contro il Cholera a New York," *Cristoforo Colombo*, September 2, 1892,1; Walter Wyman, "Safeguards Against Cholera," *The North American Review*, October, 1892, 483; "Cholera and Some Indications for its Management," *Scientific American*, October 1, 1892, p. 208. See also articles by Dr. Prudden (member of National Quarantine Committee of the New York Academy of Medicine) in *Popular Science Monthly*, "Our Ice Supply and its Dangers" (1887) "Drinking Water and Ice Supply" (1891). The former contains a "study of the transmission of disease germs in ice, with special reference to the ice supply in New York." (T. Mitchell Prudden, *Biographical Sketches and Letters* (New Haven: Yale University Press, 1927).

[32] "Condition of the Water Supply," *New York Times*, September 3, 1892.

has been used as a cesspool."[33] Evidence of behavior change in the quotation below indicates that people were heeding the Metropolitan Board of Health's advice:

> The fruit trade suffered somewhat to judge by the overflowing stock displayed by many dealers. Peaches and grapes seemed to be very reasonable, but the public was wary, though it did not manifest any undue excitement. Everybody read the circular of the Board of Health and developed a fad for drinking boiled water -- when they could get it. On the menu of many a restaurant the following legend was prominent in bold-faced type:"Boiled Water Served Exclusively for Drinking Purposes." [34]

In September 1892, the City Board of Estimate allocated money to the Board of Health to create "an emergency laboratory for the diagnosis of suspected cases of cholera" located at 42 Bleecker Street. Pasteur and Koch were the global giants of germ theory, but New York had its own champion of public health, Dr. Hermann Biggs (1859-1923). Biggs was to serve at the helm of this laboratory, as Chief of the Division of Pathology, Bacteriology and Disinfection.

Born in New York State, Biggs trained at Cornell University and Bellevue Hospital Medical College and completed graduate studies at the Universities of Berlin and Greifswald.[35] Perhaps best known for his work on the diphtheria antitoxin, for establishing tuberculosis as a reportable disease, and for serving as General Medical Officer of the New York City Department of Health from 1901-1914, Biggs taught bacteriology systematically, for the first time in the

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[33] "Cholera and Some Indications for its Management," *Scientific American,* October 1, 1892, 208

[34] "During the Cholera Season," *Harper's Weekly,* October 1, 1892, 958. References to fruit and cholera occur earlier than 1892. See *Household Economy: A Manual for Use in Schools*, (New York: Ivison, Blakeman, Taylor, and Company, 1882, 14. "Vegetables and fruits are most healthful and refreshing: they are requisite to the needs of our bodies. They supply certain acids necessary to keep the system in order, and purify the blood from eruptive tendencies. Yet fruit eaten in too large quantities tends to biliousness; and in very hot weather, when cholera lurks at every turn, should not be used without caution" and "Perfect cleanliness is every departments of the house is essential for the preservation of health. Do not be afraid of the free use of water. Never allow any decaying matter, as vegetables, fruits, etc to remain in your living rooms, as they will render the air impure." (*Household Economy: A Manual for Use in Schools*, (New York: Ivison, Blakeman, Taylor, and Company, 1882).

[35] Weinstein, "Eighty Years of Public Health in New York City," 221-237.

United States.[36] Although temporary laboratories had been set up in Berlin, Hamburg, and London, each of these had been disbanded once the cholera epidemic had ended.[37]

In a major break with the past, Biggs's laboratory was to be permanent. His laboratory became a model across the country and the globe.[38] This funding allocation and this decision to make the laboratory permanent served as important indicators of the change to a more active role of government in New York's public health. In his role as director of the world's first municipal bacteriology laboratory, Biggs employed the science of bacteriology to the detection and surveillance of infectious disease.[39] It was due to Biggs' efforts that the discoveries in bacteriology from 1880s were, according to the *New York Times*, "used to work a revolution in the methods of public health administration in the city, thus placing this important work on a scientific foundation."[40]

Without the looming specter of cholera from Germany arriving in New York, perhaps Bigg's progress with establishing his lab would not have been so speedy. The press carefully covered arriving ships from cholera-ridden Hamburg and the subsequent cholera quarantine in New York.[41] Dr. William Jenkins was in charge of the effort to prevent cholera from reaching

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[36] "Dr. Hermann Biggs." *American Journal of Public Health*, 13 (9) 1923: 760-761.
The *New York Times* reported that New Yorkers, especially the poor, can obtain the diphtheria vaccine. "On application to the bacteriology lab (between 9:00 a.m. and 4:00 p.m.) and at other hours to Division of Contagious Disease, an inspector from department will be detailed to meet the attending physician in any case of diphtheria occurring among the poor of the city, and will administer the antitoxine under his supervision without charge." See also "London Emulates New-York: Dr. Biggs Says the Mortality from Diphtheria Here Has Been Reduced 40% by Antitoxine," *New York Times*, March 13, 1895, 13. Weinstein, "Eighty Years of Public Health in New York City," 221-237. Note that Biggs' teaching was not just for university trained doctors. An announcement on page ten of the *New York Tribune* on March 14, 1890 reads "Dr Biggs to give a lecture "to young men only. Subject is "Germs in Their Relation to Disease."
[37] Weinstein, "Eighty Years of Public Health in New York City," 221-237.
[38] Weinstein, "Eighty Years of Public Health in New York City," 221-237.
[39] Obituary, *New York Times*, June 29, 1923.
[40] *New York Times*, December 13, 1913.
[41] See "Cholera in New York Bay," *Harper's Weekly*, September 17, 1892, 906; "Cholera and our Quarantine," *Harper's Weekly*, September 17, 1892, 890; "The Need of Improved Quarantine Stations,", *Scientific American*, September 17, 1892, 176; Casper W. Whitney, "Two Days with the Cholera Exiles, *Harper's Weekly,* September 24, 1892, 919; "During the Cholera Season," *Harper's Weekly*, October 1, 1892, 958; Thomas P. Hughes D.D.,

New York's shores. Some passengers on board were infected with cholera, but many were not. As depicted in this photograph (figure 3.4), under Jenkins' orders, passengers were confined to


THE IMPRISONED "NORMANNIA" PASSENGERS ON THE "CEPHEUS" OFF THE WHARF AT FIRE ISLAND.

Figure 3.4: The imprisoned "Normania" passengers on the "Cephus" off the wharf at Fire Island, *Harper's Weekly.* September 24, 1892

the ship after arrival in compliance with quarantine practices. Critics, like *Harper's Weekly,* argued that passengers should have been removed from the ship upon arrival. [42]

Moreover, Croton water was not delivered to the ship, which meant that passengers had only the contaminated Elbe water from Hamburg to drink.[43] "While Dr. Jenkins was still "thinking," one reporter from *Harper's Weekly* seethed, "J. Pierpont Morgan Esq. on September 8 came to the rescue by purchasing the *Stonington,* and offering her as a refuge for the *Normannia* passengers."[44] *Harper's Weekly*'s claim that city had mishandled the situation alongside the magnitude of the responsibility of protecting the whole country from cholera led to

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"Sanitation versus Quarantine," *The North American Review*, November 1892, 636; "What Cholera Costs Commerce," *The North American Review*, November 1892, 545.

[42] "Cholera in New York Bay," *Harper's Weekly*, September 17, 1892, 906. See Casper W. Whitney, "Two Days with the Cholera Exiles," *Harper's Weekly*, September 24, 1892, 919.

[43] E.L. Godkin, "A Month of Quarantine," *The North American Review*, December 1892, 737.

[44]Caspar W. Whitney, "Two Days with the Cholera Exiles," *Harper's Weekly*, September 24, 1892, 919.

a debate about whether federal or local authorities should control quarantine through the Port of New York.[45]

Critics lambasted machine politics as the culprit in the city's mismanagement of the cholera quarantine. Jenkins, although a medical professional, was seen as an arm of the reigning political machine. "So long as the performance of duties requiring a high order of scientific knowledge and experience [sic] men are appointed not on the ground that they are by education and practical training fitted for such important positions, but because they are political favorites or useful party tools," chided *Harper's Weekly*, "so long the chances are ten to one that duties will not be performed."[46]

However, in the end, through this quarantine practice, officials successfully prevented a cholera outbreak in New York, but the battle between machine politicians and medical experts would continue as the city's cholera prevention efforts expanded to protecting Croton water in the following months. New York's confrontation with cholera in 1892 prompted discussions about quarantine practice, public health policies, and definitive action to police water purity. The 1892 cholera scare led to the legislative changes, which mandated that the city take action to protect Croton water.

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[45] Issues of local and central control also surfaced at an international conference of Russian physicians held on December 13, 1892. Attendees agreed to tenets of permanent bureaucracy and centralization of public health. They voted to keep the local sanitary commissions to "remain permanently in force, although the danger for which they were called into existence should have passed." They determined that waste removal must "be entrusted to some one central responsible body and not left, as has hitherto been the case, in the hands of private individuals who have no interest whatever in the sanitary conditions of the town." Lastly, they ruled that quarantine had "no scientific basis" and that it should be "replaced by a system of inspection…and disinfection." See Frank Clemow, *The Cholera Epidemic of 1893 in the Russian Empire* (London: Longmans, Green and Company, 1893), 105-106. "A Federal Quarantine, *"Harper's Weekly*, October 1, 1892, 938. See also William T. Jenkins, "Quarantine at New York," *The North American Review*, November 1892, 585.

[46] "A National Quarantine," *Harper's Weekly*, December 31, 1892, 1250 This article went on to say: "Mr. Richard Croker, the leader of Tammany Hall, has furnished the country a most striking and valuable object lesson as to what we may expect under such circumstances in causing the appointment of health officer and chief of the quarantine services an obscure physician of very limited ability and experience, but who made up for all these shortcoming by the peculiar merit of being Mr. Croker's brother-in-law. His performances during the cholera crisis are familiar to the country, and the American people know now what chances they run under the existing system." ("A National Quarantine," *Harper's Weekly*, December 31, 1892, 1250).

Daly's Raids against Croton Filth

On August 21, 1891, *The World* published a scathing report on the sanitary conditions of the Croton watershed called "The Filthy Croton," which claimed that "disease and death lurk in New York's Water Supply."[47] In their investigation of the east branch of the Croton River, State Board of Health chemists Dr. Martin and Dr. Beebe sought to determine the source of pollution contaminating the water supply. The doctors found that the water used to supply the city was "undergoing constant pollution" and in a "dirty, if not dangerous condition." Martin and Beebe called for the immediate abatement of this pollution to be paid for with public monies.[48]

The *New York Evening Sun* also covered this story and perhaps more effectively. An article titled "Some Things We Drink," covered the front page with scathing revelations, such as "Garbage in heaps in plenty" and "Refuse from outhouses drained into the Streams."[49] This article demanded that the city take action and buy the land along the water's edge so that pollution could be prevented and the drinking water supply protected. The smell of the Sodom reservoir, also known as the East Branch Reservoir in the Croton watershed, received special note as being "annoying" and the reason for the stench was that the reservoir was unpaved and therefore had "twelve to fifteen feet of mud in it."[50] The article closed by asserting that "sooner or later New York must face the music.." and that "the rules and the efforts made by the State and city authorities to maintain the purity of the Croton water are, as matters stand, inadequate… No one either observes or cares for them."[51]

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[47] "The Filthy Croton," *The World,* August 26, 1891, 9-14.
[48] "The Croton Water Is Foul," *New York Times,* August 22, 1891, 1.
[49] "Some Things We Drink," *New York Evening Sun,* August 21, 1891, 1. It is now believed that Jacob Riis may have written this article. No by-line appears with the article.
[50] "Some Things We Drink," *New York Evening Sun,* August 21, 1891, 1.
[51] "Some Things We Drink," *New York Evening Sun,* August 21, 1891, 1.

While prevention of pollution in the area was under the auspices of the State Board of Health, founded in 1880, and of the Department of Public Works (DPW), the investigation by Martin and Beebe showed, as *The New York Times* put it, "the former to be dead letters and the latter to be profitless if well intended." The State Board of Health and the city had conducted similar investigations of the Croton watershed in the past, both in 1885 and 1888 with similar findings, and neither the city nor the state had taken any action.[52] In 1885, the State Legislature passed an act granting power to the State Board of Health to prevent contamination of the water supply. The Board did not act at this time. Three years later, the State Board executed an investigation of the sanitary conditions of the Croton watershed and found it to be polluted. The New York State Board of Health survey of the area selected for the Croton Reservoir in 1888 revealed that 20,000 people lived in the watershed region, along with 12,243 horses, cows, and other livestock. Accompanying this human and animal population, were, of course, manure-filled barns and houses with privies. After completing this survey, the State Board of Health issued rules and regulations designed to protect the city's water supply, being drawn from this region. Local residents largely ignored these sanitary regulations due to a combination of carelessness, ignorance, and "retaliatory indifference," for many residents resented the city's continued acquisition of land and eviction of its tenants in the region.[53] The inaction of the State Board of Health meant that the city's DPW would need to take the lead if change were to occur.[54]

Five years after this investigation, to counteract this noncompliance, the State Legislature in March of 1893 passed the Webster Act, which was "to provide for the sanitary protection of

[52] "The Croton Water Is Foul," *New York Times*, August 22, 1891, 1.
[53] Charles H. Weidner, *Water for a City: A History of New York City's Problem from the Beginning to the Delaware River System* (New Brunswick: Rutgers University Press, 1974), 98.
[54] "Condition of the Water Supply," *New York Times*, September 3, 1892

the sources of water supply of the City of New York." The act gave the city's DPW the power to acquire land near any water source used to supply the city. The DPW then delegated this broad power to the newly-formed Aqueduct Commission so that the engineers of the Commission could complete much of the necessary work.[55] Michael T. Daly, the Commissioner of Public Works, deputized Alphonse Fteley, Chief Engineer of the Aqueduct Commission, and Assistant Engineers to exercise "all the power and authority vested in (Daly) by law to suppress and remove all sources of pollution so situated as to endanger the purity of the water supply to the City of New York."[56]

Daly launched the operations to protect the watershed, which became known as Daly's Raids. He and his team began forcibly burning barns and privies, moving homes, destroying businesses, and disinterring bodies from cemeteries in order to protect the city's water supply in the Croton watershed. In order to create a 300-foot barrier around the reservoirs and feeder streams as mandated by the Common Council, Daly and his men combed the area and ordered homes and barns evacuated and privies burned.[57] Financial settlements for land seized by the city were to be handled afterwards. Vested with this authority and under new leadership, the DPW was now in a position to effect lasting change.

Before and during Daly's Raids, city authorities and the independent New York Academy of Medicine disagreed over this legislation regarding the Croton watershed. Whereas city officials maintained that the Webster Act granted sufficient power to the Commissioner of Public Works to implement sanitation measures upstate, the Academy of Medicine demanded that a special commission be established to enforce the act. It felt medical expertise was lacking

[55] Weidner, *Water for a City*, 98.
[56] Minutes of Stated Meeting of the Aqueduct Commissioners, held at their office, No. 209 Stewart Building, on Wednesday, April 12, 1893, at 3 o'clock p.m. Minutes of the Aqueduct Commission, vol. 9.
[57] Diane Galusha, *Liquid Assets: A History of New York City's Water System*. (Fleischmanns: Purple Mountain Press, 2002), 45.

from the equation and that the involvement of a group of experts was preferable to one individual's power. The Academy wanted additional legislation to supplement the Webster Act and, to this end, they drafted their own Croton Watershed Bill, which provided for a new board called the Croton Water Commission to oversee the sanitary measures.

According to Alexander E. Orr and Seth Low, members of the Committee on Quarantine of the Chamber of Commerce, the main concern of the Academy of Medicine was the opinion that promulgating and enforcing sanitary regulations to protect the water supply in Westchester, Duchess, and Putnam counties were duties "best entrusted to a commission or board rather than to any individual."[58] Members of the Academy also doubted whether the Webster Act covered the Daly's Raids. Low and Orr maintained that water affected "business and the commerce" as well as "the health of its citizens," and therefore recommended the careful consideration of the legislation proposed by the Academy of Medicine.[59]

On March 9, 1893, the members of the Academy of Medicine called a special meeting about the matter. Attendees heard a paper about the Croton Watershed and viewed lantern slide illustrations of the area.[60] In the discussions that followed this presentation, Academy members voiced their concerns that the Webster Act was "both inefficient and needlessly expensive"[61] and

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[58] "For Pure Croton Water: Doctors Urge Changes in the New Law," *New York Tribune*, March 25 1893, 7. Although Seth Low claimed to be acting in individual capacity here, it must be noted that he in became the reform mayor whose election in 1901 marked a major shift in power and a crushing defeat for Tammany Hall.

[59] "For Pure Croton Water: Doctors Urge Changes in the New Law," *New York Tribune*, March 25 1893, 7. On April 11, 1893, the Assembly Committee on Cities in Albany heard two bills that had been introduced both to amend the current law. The first amendment was the one submitted by the New York Academy of Medicine with its mandatory commission, which would make and enforce regulations. The second amendment granted the Commissioner of Public Works those same powers that would be allocated to the special commission were there one. The former failed and the latter passed. Although the Academy of Medicine's amendment did not pass, the Academy's efforts to reform the Webster law emphasized the need for clarity about where the necessary power to implement the law would reside. See "Mr. Daly's Croton Raid: Watershed Nuisance to be Attacked Tomorrow," New York Times, March 28, 1893, p. 9.

[60] New York Academy of Medicine. Minutes of Meetings. November 16, 1884 – December 19, 1901.

[61] New York Academy of Medicine. Minutes of Meetings. November 16, 1884 – December 19, 1901. Although there was no official connection between the New York Academy of Medicine and the Board of Health, the Academy was often involved in matters of concern to the Board. (Email exchange on August 17, 2010 with Arlene

that "this act gives enormous power to a single man – a part of which power is legislative."[62] Academy members chose not to sanction the work of the Commissioner of Public Works because they felt that "the sanitary care of the watershed should be entrusted to a commission so constituted as to inspire confidence that the steps taken will be in accord with the principles and practices of sanitary science."[63]

Regardless of this dissent, Daly's Raids, the "vigorous crusade" against pollutants in the Croton Watershed, went ahead.[64] The Webster Act gave Daly the power for a period of three years to enter any land in Westchester, Dutchess, and Putnam counties, if this land was adjacent to "any and all the sources of the water supply" to abate any causes of pollution. Section twenty-seven of the law, signed by Governor Flower, empowered the Commissioner of Public Works to remove summarily all pollutants.[65] "No sanitary precautions within the city could stop the epidemic if the water supply became infected with the germs of this disease," decried *The New York Times* on March 24, 1893. "If there is any doubt, therefore, as to the sufficiency of powers vested by this act or by existing laws in the local authorities for the sanitary protection of the watershed, the State Legislature should not hesitate to remove that doubt by the enactment of a supplementary measure..."[66]

On March 28, 1893, *The New York Times* again reported that Daly "had full power summarily to destroy all the barns and outhouses, which, in his opinion, polluted the water

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Shaner, Assistant Curator and Reference Librarian for Historical Collections, The New York Academy of Medicine Library). For a history of the New York Academy of Medicine, see Philip Van Ingen, *The New York Academy of Medicine: Its First Hundred Years* (New York: Columbia University Press, 1949).

[62] "Webster Bill Inadequate: That's the Academy of Medicine's Announcement," *New York Times*, April 7, 1893, 2.

[63] New York Academy of Medicine. Minutes of Meetings. November 16, 1884 – December 19, 1901.

[64] "Mr. Daly's Croton Raid: Watershed Nuisance to be Attacked Tomorrow," *New York Times*, March 28, 1893, 9.

[65] "For a Raid on the Watershed: The Public Works Commissioner and Small Army Will Invade it Tomorrow," *New York Tribune*, March 28, 1893, 4.

[66] "Croton Watershed Bill," *New York Times*, March 24, 1893, 1.

supply."[67] His plan was to burn down those outhouses located in Carmel, Tenetta, Mount Kisco, Kensico, and Brewster first and then to work south, with the hope of having abated all the nuisances by July 1, 1893. Daly explained that when outhouses were removed, he would serve a notice to the property owners of a hearing to be held at his office about the seizing of the land and the need to prevent the reestablishment of the nuisances. "I do not think," Daly added, "that the persons whose property will be destroyed will receive our little army of men with much favor, and it may be that serious opposition will be offered to our workmen."[68]

In order to be prepared to address opposition on site, Daly was to travel with Mr. Dykman, a lawyer for the city, who would bring with him a certified copy of the law. Daly's party would also include Chief Engineer George W. Birdsall and "a gang of strong-limbed laborers… armed with axes, picks, shovels, handsaws"[69] with which "to tear down or burn anything that he might order them to destroy."[70] To combat the complaint that the law vested too much power in one man, Daly's Raids were a combined effort of lawyer, engineer, city official, and workers. The city claimed that the act already granted sufficient power to the Department of Public Works. "There should be no doubt about the amplitude of Commissioner Daly's powers," claimed *The New York Times*.[71] Action was the key in this equation. By acting swiftly and decisively, the DPW and the Aqueduct Commissioners sought to demonstrate the power these bureaus now possessed since the passage of the Webster Act.

On March 30, 1893, Chief Engineer Birdsall, and Lawyer Dykman, Commissioner Daly, and his men arrived at a hotel called the Palmer House on the west bank of Croton Lake near

[67] "Mr. Daly's Croton Raid: Watershed Nuisance to be Attacked Tomorrow," *New York Times*, March 28, 1893, 9.
[68] "Mr. Daly's Croton Raid: Watershed Nuisance to be Attacked Tomorrow," *New York Times*, March 28, 1893, 9.
[69] "For a Raid on the Watershed: The Public Works Commissioner and Small Army Will Invade it Tomorrow," *New York Tribune*, March 28, 1893, 4.
[70] "The Croton Valley War: Yesterday's Work by the Invaders," *New York Tribune*, March 31, 1893, 5.
[71] "Power to Protect the Water," *New York Times,* March 30, 1893, 4.

Pine's Bridge.[72] This hotel was known for its long-standing role as a meeting place for Republican and Democratic leaders in Westchester County. Locals believed its proprietors, Hal and George Palmer, to be "possessors of a strong political pull."[73] Dozens of newspaper reporters followed the party as they arrived at the "grimy entrance" of the hotel, where they were greeted by the proprietor, George Palmer.[74]

Hungry and tired after a strenuous day of inspecting the Croton watershed, the party sought refreshments. After dinner, Commissioner Daly, Lawyer Dykman, and Chief Engineer Birdsall inspected the surroundings of the hotel. During this inspection, Daly noted that the drainage from the hotel and horse barn ran down to the Croton Lake. Next, Daly and his team departed the hotel for Mount Kisco, where they held a short press conference, at which Daly told reporters:

> One of my objects in visiting Croton Lake was to inform myself as to the condition of buildings standing close to the water supply. I saw, and so did Mr. Dykman and Chief Engineer Birdsall, enough to make it quite clear that the Palmer House is a source of pollution to our water supply.[75]

As a result of the inspection, Daly issued a letter to the Palmers stating that their hotel was a "nuisance" contaminating the water supply and that the Palmers were to move out of the hotel at once. Daly assured the reporters that the size of the Palmer Hotel would be measured so that the issue of compensation could be dealt with intelligently when the time came. One reporter questioned Daly's decision to condemn the hotel, stating that the Palmer brothers were believed to have political pull, one being a "strong Democrat" and the other a loyal Republican. Daly

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[72] "Chuck Steak and Foul Air; Mr. Daly dines at the Palmer House and then Condemns it," *New York Times*, March 31, 1893, 8.
[73] "Chuck Steak and Foul Air; Mr. Daly dines at the Palmer House and then Condemns it," *New York Times*, March 31, 1893, 8.
[74] "Chuck Steak and Foul Air; Mr. Daly dines at the Palmer House and then Condemns it," *New York Times*, March 31, 1893, 8.
[75] "Chuck Steak and Foul Air; Mr. Daly dines at the Palmer House and then Condemns it," *New York Times*, March 31, 1893, 8.

replied: "Political pull will not be allowed to count with me where the public health is at stake."[76] Daly insisted that his actions were nonpartisan and that public health trumped politics. Yet, the fact that he was a Tammany Hall Democrat loomed large in the press coverage and in the public perception.

Following the Palmer House incident, Daly and his team visited Mount Kisco. Their first stop in this town was the office of E.T. Bailey, the president of the village, where they met with the local Board of Health, including its president, D.F. Gorham, about the sanitary condition of the village. This inquiry revealed that open drains from houses and barns emptied into the Branch Brook and the Kensico River and that there were no rules about where to dump refuse from outhouses.[77]

When Daly asked that Mount Kisco cease its dumping of waste into the water sources, the members of the local Board of Health responded that this would not be possible, since they were looking after the good health of Mount Kisco and not of New York. Gorham maintained his stance that it was in the best interest of the village to dump their sewage and have it carried away by these two streams. He said that he refused to endanger Mount Kisco in order to protect New York.[78] Regarding sewage, county and city stood at odds with each other with interests that seemed irreconcilable. Daly mandated the termination of the current drainage system. The Commissioner and his entourage then investigated the Branch Brook and the Kensico River area, where they discovered a "deplorable state of affairs" that included attempts to conceal the unsanitary conditions from Daly and his team.[79] Apparently, Mount Kisco residents feared that Daly would wipe out their village altogether. For land that was seized, landowners received

[76] "Chuck Steak and Foul Air; Mr. Daly dines at the Palmer House and then Condemns it," *New York Times*, March 31, 1893, 8.
[77] "The Croton Valley War: Yesterday's Work by the Invaders," *New York Tribune*, March 31, 1893, 5.
[78] "The Croton Valley War: Yesterday's Work by the Invaders," *New York Tribune*, March 31, 1893, 5.
[79] "The Croton Valley War: Yesterday's Work by the Invaders," *New York Tribune*, March 31, 1893, 5.

notice of a hearing to be held April 6, 1893 at 31 Chambers Street in New York.[80] Residents were surprised when some of them were allowed to remain in their homes after the investigations. "No one could convince them that (Daly) had not some diabolical reason for permitting them to remain," *The New York Tribune* reported.[81] These fears illustrated deep suspicions about the city government's ability to handle sanitation fairly and about the city's possible larger motives in the Croton watershed.

The next stops on Daly's tour on March 31, 1893 were Brewster and Carmel where he personally inspected all potential sources of pollution.[82] In Brewster, a crowd of locals followed Daly and his men as they made their inspection to find six buildings that emptied their sewage into Tonetta lake. He asked for how long this sewage dumping had been occurring and was told for several years.[83] A condensed milk factory on the east branch of the Croton was Daly's next destination. The factory handled 40,000 gallons of milk daily and the washings of the milks cans were being emptied into the Croton. Daly condemned approximately twelve houses in Brewster and twenty houses in Carmel. Daly then asked Birdsall to file maps of the sites so that the city could acquire these properties at once.[84] The work of abating nuisances continued in the towns of Pawling, Patterson and Towners Station. The discovery of a dead body in a potter's field within seventy feet of a stream caused much alarm. Dr. Edson of the Board of Health of New York City declared this body to be the "most serious menace" yet to be encountered and demanded the immediate exhumation of the body. This discovery resulted in a new decree

[80] "Chuck Steak and Foul Air; Mr. Daly dines at the Palmer House and then Condemns it," *New York Times*, March 31, 1893, 8.
[81] "The Croton Valley War: Yesterday's Work by the Invaders," *New York Tribune*, March 31, 1893, 5.
[82] "Mr. Daly's Big Day's Work: Condemning by Wholesale in Brewster and Carmel," *New York Times*, April 1, 1893, 1.
[83] "Mr. Daly's Big Day's Work: Condemning by Wholesale in Brewster and Carmel," *New York Times*, April 1, 1893, 1.
[84] "Mr. Daly's Big Day's Work: Condemning by Wholesale in Brewster and Carmel," *New York Times*, April 1, 1893, 1.

mandating the use of metal caskets for all burials and a distance of one thousand feet from any water source for burials.[85] In addition to bodies of the dead, houses of the living were also moved, including a whole block of homes in the town of Carmel.

At the conclusion of the work in Carmel and Brewster, Daly made a public statement, which decried the need for medical expertise when unsanitary conditions were apparent to the eye. He declared that the closeness of the sources of pollution to the Croton River "did not require the opinion of a sanitary expert" to approve their immediate removal, thereby rejecting the view of the New York Academy of Medicine.[86] He went on to explain that after his work was completed, the watershed would then undergo a careful and critical analysis by medical experts, including the State Board of Health and other personnel selected by the Academy of Medicine.[87] Daly appeased the medical professionals by allowing them access to the site after the major work of clearing the sources of pollution had been completed, with the hope that such after-the-fact inspections by doctors and sanitarians might serve to quell any public sentiment viewing Daly's Raids as unnecessarily extreme.

The majority of the news coverage of Daly's Raids was critical of the drastic approach employed by the DPW to clean the Croton watershed. Both upstate and downstate papers criticized Daly's methods, although not his overall purpose. The *New York Tribune,* on April 2, 1893, described the raids in military terms like "invasion" and "ravages," contending that such "sudden and violent proceedings" were not warranted. This newspaper did not question Daly's legal authority but rather posited that since he possessed unlimited powers, he was "under a

[85] "Daly's Latest Visit: A Sweeping Rule Promulgated Concerning Burials," *Putnam Courier*, May 5, 1893, 1
[86] "Mr. Daly's Big Day's Work: Condemning by Wholesale in Brewster and Carmel," *New York Times*, April 1, 1893, 1.
[87] "Mr. Daly's Big Day's Work: Condemning by Wholesale in Brewster and Carmel," *New York Times*, April 1, 1893, 1.

special obligation to exercise it with discretion and mercy."[88] This, however, he did not do. Daly's men were an "invading army of nuisance-destroyers"[89] who "intruded upon" the domains of others, driven by "a council of war [that] decides on an invasion." [90] Mr. Daly led a "small army of subordinate raiders, experts, and reporters" in the "raids."[91] Landowners upstate could apply for injunctions, however futile they may be, to "restrain the New York hostiles from the raid of devastation upon which they are bent."[92] An article in *The Illustrated American,* on April 22, 1893, compared Daly's Raids of Putnam to "Sherman's march to the sea,[93] or the Vandals' descent[94] upon Rome,"[95] both known for their extreme destruction. This article featured a visual collage of Daly's Raids, including one of Daly and his team (figure 3.5).

[88] "Commissioner Daly's Raids," *New York Tribune*, April 2, 1893, 6.
[89] "For a Raid on the Watershed: The Public Works Commissioner and Small Army Will Invade it Tomorrow," *New York Tribune*, March 28, 1893, 4.
[90] "Mr. Daly's Big Day's Work: Condemning by Wholesale in Brewster and Carmel," *New York Times*, April 1, 1893, 1.
[91] "Another Watershed Raid to be Made," *New York Tribune*, April 26, 1893, 11.
[92] "For a Raid on the Watershed: The Public Works Commissioner and Small Army Will Invade it Tomorrow," *New York Tribune*, March 28, 1893, 4.
[93] This is a reference to the campaign led by Union Army Major General William Tecumseh Sherman during the American Civil War in late 1864 from Atlanta to Savannah resulting in severe damage to industry and homes. See Herman Hattaway and Archer Jones, *How the North Won: A Military History of the Civil War* (Champaign: University of Illinois, 1991).
[94] The Vandals, a Germanic tribe, sacked Rome in 455 BC. See Bryan Ward-Perkins, *The Fall of Rome and the End of Civilization* (Oxford University Press, 2006).
[95] "Lustration of the Croton," *The Illustrated American*, v. 13(no. 166), April 22, 1893, 475. This article was accompanied by several photographs of barns, houses, and pigpens boarding the water in Carmel and one of Daly and his men.

Figure 3.5: Daly and his men, "Lustration of the Croton," *The Illustrated American*, April 22, 1893.

The accounts of the "dwellings laid waste by the autocratic officer of the law," the article continued, "read like chapters from Zola's *La Terre*."[96] Daly would be remembered in Putnam County as "Atilla the Scourge was remembered by the Romans: in New-York County his friends in Tammany Hall may point to him as the man who cleaned out the Augean Stables of the Croton Watershed."[97] But mythical and historical references aside, perhaps most damning criticism of Daly was that his power was arbitrary and that Daly was "…responsible to no one but himself, and to nothing but his own judgment, conscience, -- and he a Tammany Man, too."[98] This outcry implies that as a Tammany man, Daly should be on the side of the little guy, the

[96] "Lustration of the Croton," *The Illustrated American*, v. 13(no. 166), April 22, 1893, 475. Emile Zola's 1888 novel, *La Terre*, was a violent and disturbing portrayal of the hardship of rural life in 1870 La Beauce, France.
[97] A reference to one of the labors of Hercules in which Hercules was to clean the cattle stables of King Augeas, which he achieved by redirecting a river and flooding them clean. Encyclopedia Mythica. Accessed August 25, 2011. http://www.pantheon.org/articles/a/augean_stables.html "Mr. Daly's Big Day's Work: Condemning by Wholesale in Brewster and Carmel," *New York Times*, April 1, 1893, 1.
[98] "Lustration of the Croton," *The Illustrated American*, v. 13(no. 166), April 22, 1893, 475.

farmers in this case, and that he was not acting in accordance with his party's stance. "What is apparent now," lamented one editorial, "is that the work in question was undertaken in a thoroughly irrational and unscientific way. Commissioner Daly was armed with brute force – that is all – and he exercised it in precisely the way that would be looked for in a Tammany official of his stamp."[99]

Did such "brute force" counteract or compound doubts about the city's sanitary expertise and legal authority? Some medical professionals thought so, calling Daly's Raids "clownish and brutal" and possibly ineffectual in eliminating cholera germs. "The care of the public health must be taken out of the hands of ward politicians and put into the keeping of men who are fitted by study, by experience, and by morality, to solve the tremendous problems of the prevention and cure of disease" argued *Medical News*, "The mechanisms and methods of such solutions must be permanent; they cannot be created in a few days by a panic stricken populace or by bouffe politicians, but they are the products only of many years of virile and conscientious intelligence."[100]

In addition to these concerns of the medical community, the question of the constitutionality of the Webster Act persisted. The Farmers' Club met in Bedford, New York on April 12, 1893 to debate this issue.[101] At this meeting, Lawyer Charles Haynes argued that the act was constitutional since it included a process for compensation to landowners for land seized by the city. James Woods, President of Farmers Club, countered that the Webster Act was unconstitutional because it did not provide for drainage to replace the system taken away from property owners. Furthermore, he contended that Commissioner Daly was guilty of arson for the burnings of private property. Woods continued, declaring that "the wild Irishman," Michael

[99] Editorial, *New York Tribune*, May 13, 1893, 6.
[100] "Our Preparation for Cholera," *Medical News*, April 8, 1893, 1
[101] "Denouncing Commissioner Daly," *New York Tribune*, April 13, 1893, 7.

Daly, no longer went to the Donnybrook Fair with a blackthorn in this hand. He "now comes to Westchester County as a Commissioner of Public Works and in its Donnybrook Fair style, cracks a head wherever he sees one."[102] Upstate farmers and residents exhibited a clear lack of trust of New York City government. They feared that due to Tammany corruption, they would not be compensated fairly for their property taken by the city. Tammany Hall and its personification in Daly loomed large in the press portrayal of Daly's Raids.

In some ways, Daly epitomized the ward politician. A Tammany man, and Irish-born as well, Daly was "personally known to as many politicians as any man in New York."[103] While in office, Daly stood firmly in the camp of then Boss Richard Croker. It was said that Daly opened Croker's letters and answered them for him. Daly was Croker's "intimate friend" and "Croker's second self."[104] A cartoon in *Puck Magazine* (figure 3.6) captured Croker's central role in

Figure 3.6: New York's New Solar System from Puck Magazine, 1898. Library of Congress, Library of Congress Prints and Photographs Division, accessed February 11, 2012, http://www.loc.gov/pictures/resource/cph.3g07879/.

[102] "Denouncing Commissioner Daly," *New York Tribune*, April 13, 1893, 7. Originally, Donnybrook referred to an annual fair in Ireland dating back to 1204 known for its rowdiness, fights, and whiskey drinking.
[103] "Michael T. Daly, Politician, Dies," *New York Times*, November 6, 1913.
[104] "Michael T. Daly, Politician, Dies," *New York Times*, November 6, 1913.

municipal politics. However, Daly's political career began with him acting in opposition to Tammany Hall.

Born in Ireland in 1841, Daly came to America at the age of ten. He graduated from the City College and entered politics by joining the Andrew Jackson Club, later known as Apollo Hall. As a member of this group, Daly joined its fights against Tammany Hall. Under Mayor Oakley Hall, Daly held the position of Second Mayor's Marshal, but he lost that position since he opposed Tammany Hall. He then served as a clerk in the Marine Court and the Supreme Court and in 1890, he became Chief Clerk of the City Court. In 1891, Daly was appointed Commissioner of Accounts by Mayor Grant. After Thomas F. Gilroy became Mayor, he appointed Daly as Commissioner of Public Works in January of 1893.[105] Daly succeeded Gilroy in this role. He served the remainder of Gilroy's term and then was reappointed for the full term at an annual salary of $8,000.[106] On the day of Daly's appointment by the new mayor,[107] *The New York Times* described the current political situation as "an incipient schism in Tammany Hall" with Croker and Gilroy united against ex-Mayor Grant and Police Commissioner Martin. "There is no man in the wigwam who enjoys more of Croker's confidence than does Mr. Daly."[108] Given his prominent place in Tammany Hall and despite the overall unfavorable press coverage of the raids, Daly's role upstate raised awareness about the need for the protection of water quality and emphasized the behavior change needed to assure safe and clean water.

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[105] "Michael T. Daly, Politician, Dies," *New York Times*, November 6, 1913.
[106] "Named by Mayor Gilroy," *New York Times*, January 5, 1893, 5.
[107] "I appointed Mr Daly," said Mayor Gilroy, "because I know that he has the ability to fill the place and because he has pledged himself to carry out the policy I inaugurated as Commissioner of Public Works, and because I know that he will fulfill my mission of giving this city the kind of streets it should have. I felt that when I left the Dept of Public Works that my mission had not yet been completed. Naturally I am peculiarly interested in that dept. I will consult about its affairs with Mr Daly and he will consult with me. His long service to the City Government has given him the necessary training for the place, and he is an exceptionally well educated man." ("Named by Mayor Gilroy," *New York Times*, January 5, 1893, 5).
[108] "Named by Mayor Gilroy," *New York Times*, January 5, 1893, 5.

Sanitation and City Streets

Back downstate, localized sanitation efforts flourished with the news of the 1892 cholera scare. In many ways, cholera was the model for a miasmic disease to sanitarians and their followers, for it had been "shown [to] spread and kill in conditions of filth and overcrowding."[109] Street cleaning was a central part of this sanitation crusade. A dedicated sanitarian, Colonel George E. Waring (1833-1898), led this new regime of the street cleaning effort. A Civil War veteran, Waring was a sanitary engineer who published widely on sewage disposal, house drainage and street cleaning throughout the nineteenth century. Appointed as Street Commission for the City of New York in 1895, he served in this capacity for three years. Perhaps what is best known about Waring's sanitation tenure was his very visible decision to uniform the street cleaners in all white to symbolize purity and cleanliness.[110] This illustration from 1897 shows one of these uniformed street cleaners, called "The White Wings," at work (figure 3.7).

[109] Michael Worboys, *Spreading Germs: Disease Theories and Medical Practice in Britain, 1865-1900*, Cambridge: Cambridge University Press, 2000, 113.
[110] "Colonel George E. Waring Dead," *New York Times*, October 30, 1898, 1. Jennifer Lee, "He Cleaned the Streets, and Left the Presidency to Others," *New York Times,* October 1, 2009.

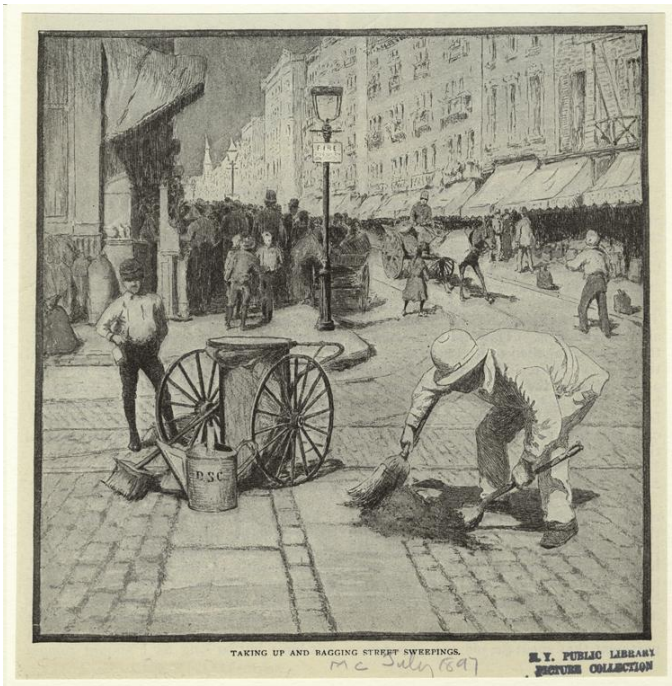

Figure 3.7: Taking up and bagging street sweepings, *McClure's magazine*, 1897, New York Public Library Digital Gallery, accessed June 26, 2012. http://digitalgallery.nypl.org/nypldigital/, Courtesy of The New York Public Library. www.nypl.org.

On May 26, 1896, Colonel Waring, sporting a white helmet and a bob-tailed coat and mounted on horseback, kicked off the first annual parade of the Street Cleaning Department. Some 2,200 men, employees of the city's Street Cleaning Department, each dressed completely in white, marched in military form to martial music. "The street sweepers," *The New York Tribune* reported, "dressed in their white uniforms, freshly washed for the occasion, and wearing new white summer helmets, presented an appearance so creditable as to call forth much applause from the people on the sidewalks, the men marching surprisingly well, considering the lack of military training."[111] When a *New York Times* reporter asked Waring about the reason for the parade, he replied, "Why," he said, "the reason is the same as that for all parades – that the men may be seen and may see."[112]

[111] "Waring's White Army," *New York Tribune*, May 27, 1896, 13
[112] "A Street Cleaners' Parade," *New York Times*, May 27, 1896, 1.

Appearance was important and making a spectacle of these street cleaners gave them credibility and raised public awareness about their work. "The number of men in the parade was so great as to astonish many persons who had not thought of the work which the department performs everyday," *The New York Times* commented.[113] *The San Francisco Chronicle* added; "New York has placed street cleaning on a respectable and dignified plane by uniforming the municipal employees in that dept of its service."[114] Although street cleaners wore uniforms in Europe, these men were the first uniformed in the United States. *The San Francisco Chronicle* article continued:

> The duck-clad street-sweepers instantly attract the attention of a visitor to New York City. He wonders at first why these municipal servants should be uniformed. After revolving the matter in mind it occurs to him that such a body is organized to protect the lives of citizens quite as faithfully as do the policemen and the firemen. To put a street sweeper into prescribed garments force him to consider himself more of a factor in the municipal welfare than if he worked in his own generally shabby clothes. And clothing them thus has a moral effect on the community at large.[115]

And, according to *The New York Times*, it was the "community at large" that attended this parade, for the spectators "were composed of men and women who did not seem to be frequenters of Fifth Avenue. Nearly every one that stood on the curbstones had some friend in the procession, and when that friend appeared he was greeted with yells of "Hullo, Tom! How d'yer like the new job?" "Tom" generally kept silence. But while the spectators were at first inclined to scoff, many of them remained to praise for the street cleaners generally presented an unexpectedly good appearance."[116] A visual comparison of street cleaners before and after Waring emphasized the order and cleanliness of the new regime (figure 3.8).

[113] "Waring's White Army," New York Tribune, May 27, 1896, 13
[114] "Uniformed Street Cleaners of New York," San Francisco Chronicle, June 14, 1896, 15.
[115] "Uniformed Street Cleaners of New York," San Francisco Chronicle, June 14, 1896, 15.
[116] "A Street Cleaners' Parade," New York Times, May 27, 1896, 1.

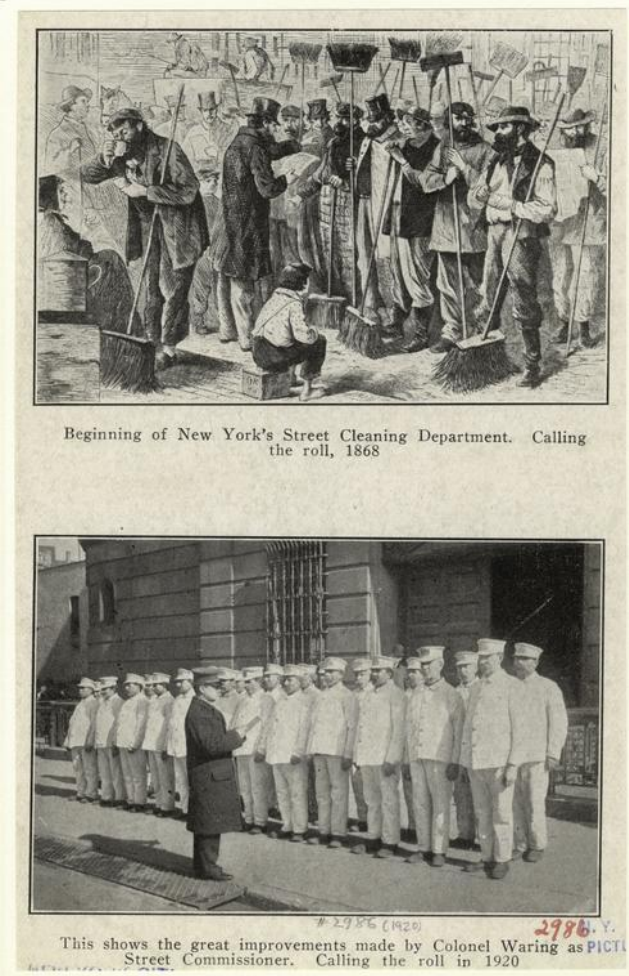

Figure 3.8: Beginning of New York's Street Cleaning Department. Calling the roll, 1868 ; This shows the great improvements made by Colonel Waring as Street Commissioner : Calling the roll in 1920," *Valentine's city of New York : a guide book,1920,* New York Public Library Digital Gallery, accessed June 26, 2012, http://digitalgallery.nypl.org/nypldigital/, Courtesy of The New York Public Library. www.nypl.org.

The clean and organized appearance of these men served to represent to the general public that the city's street sanitation system was in good order, with a top-notch staff and with Croton water.

The ivy-covered Murray Hill Distributing Reservoir served as the backdrop for the May 26, 1896 Street Cleaning Department parade, a fitting swan song for the reservoir, as it was slated for removal. In 1891, the Assembly had passed a bill providing for the distributing reservoir to be covered over with a giant roof upon which a "public beer and botanical garden"

would be built.[117] In this proposal, the water in the reservoir would continue to be used, which raised major concerns about water quality of covered water from opponents of the bill. The opposition led by the Real Estate Exchange quickly sought to intervene with the Senate to convince them not to pass the law passed by the Assembly.[118] An air-garden on top of the distributing reservoir would ruin Bryant Park, opponents argued. "It would be an eyesore and a defacement of Fifth Avenue and worst of all, it would through the drainage of its pipes, and through the waste, refuse, and dirt inseparable from such a resort, to a certainty so defile the water stored beneath as to cause the most serious danger of a pestilence."[119]

The beer garden was voted down, but the damage to the reservoir's reputation had been done. As the reservoir's utility declined, people began to criticize its aesthetic value and to call for its removal. "The reservoir (is) a useless institution as such, a hideous object to the sight, and a blight upon the neighborhood… It is rarely more than half full, and in its leaky condition overflows the surrounding sidewalks and keeps the atmosphere of the neighborhood damp and malarious at all times…"[120]

In 1893, the city began to plan for the eventual demise of the distributing reservoir. "Most citizens will feel a pang of regret at the demolition of this impressive pile," mused *The New York Times*, "albeit its place to be taken by a fine specimen of modern architecture, to serve a less prosaic purpose."[121] In 1896, the reservoir hosted the street cleaning parade (figure 3.9).

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[117] "Against the Beer Garden, Property Owners Oppose the Reservoir Scheme," *New York Times*, March 12, 1891, 2.
[118] "Against the Beer Garden, Property Owners Oppose the Reservoir Scheme," *New York Times*, March 12, 1891, 2.
[119] "The Air-Garden in the Senate," *New York Tribune*, March 16, 1891, p. 6.
[120] "In Place of the Reservoir, Property Owners Desire to Extend Bryant Park," *New York Times*, March 26, 1891, 8.
[121] "Murray Hill and the Reservoir," *New York Times*, February 27, 1898, 4.

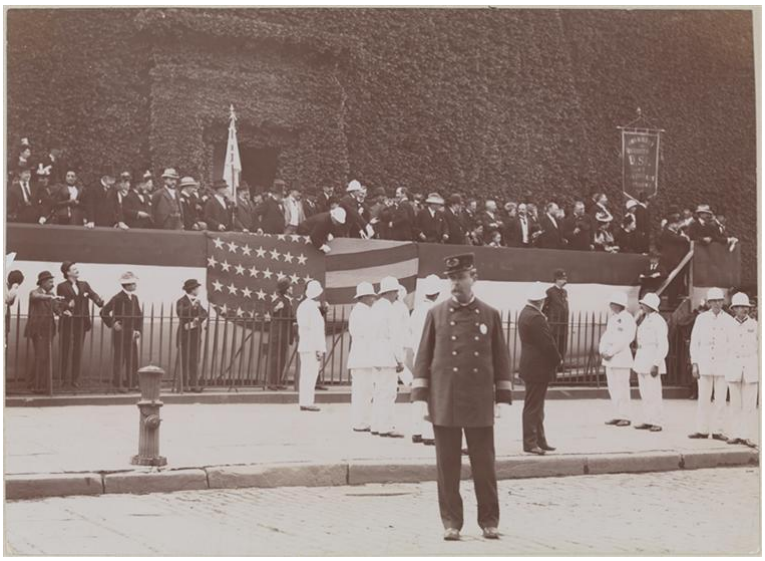

Figure 3.9: White Wings, May 26, 1896. A reviewing stand for the Department of Street Cleaning parade, set up in front of the Croton distributing reservoir. Gelatin silver print, Byron Company, NY, 1896. Accessed October 12, 2011, www.mcny.org

Initial plans sought a public park to be built on the site, but another public institution ended up replacing this emblem of public water. By 1900, the reservoir had been demolished and replaced by the New York Public Library, completed in 1911.[122]

Conclusion

Public health was an emerging field in the nineteenth century. The anti-contagionist theory of disease maintained that filth indicated disease while contagionists supported a variety of germ theories. Removal of filth was usually a boon for health, as long as that filth was not then disposed of into the drinking water, as was the case in Chadwick's London of 1848. Public health advocates in New York were connected to a network of experts across the Atlantic. London was the first city from which New Yorkers learned about the link between water and disease transmission, but this was a long and slow process that did not conclude until the early twentieth century. London's experience with cholera showcased the evolution of a government-

[122] "The Library's Extremely Useful Predecessor," *New York Times*, January 20, 2011.

run public health administration led by its General Board of Health. New York later followed suit by increasing and formalizing the role of city and state government in disease prevention.

Despite scientific progress on germ theories, the miasmatic perspective persisted and it played an important and beneficial role in securing the purity of drinking water. Belief in the sanitary value of removing filth allowed for the direct work of protecting the drinking water supply in the Croton watershed to commence in earnest. The years 1892 and 1893 were pivotal for public health and water management in New York City. In 1892, city officials established the world's first municipal bacteriology laboratory during the cholera scare of that year.[123] Major events of 1893 included progress with milk safety, the division of the city into sanitary districts, and the protection of the Croton watershed. In these two years, government involvement in cholera prevention and in assuring the purity of drinking water increased dramatically. [124]

Throughout the nineteenth century, we see an evolution from a time when there was no public confidence in the city to handle outbreaks of disease to a time when the city protected the water supply in advance thereby preventing new cases of cholera. Epidemics forced city

[123] "Dr. Hermann Biggs," *American Journal of Public Health*, 13 (9) 1923: www.ncbi.nlm.nih.gov/pmc/articles/PMC1354599

[124] For a concise and interesting overview of this story, see article by Julie Miller, "To Stop the Slaughter of the Babies: Nathan Straus and the Drive for Pasteurized Milk, 1893-1920," *New York History*, 74:2 (1993), 159. In June, 1893 Nathan Straus opens first "depot" for pasteurized milk on East 3rd Street in NYC which distributes low-cost pasteurized milk to the poor in an effort to correct the problem of milk being diluted by farmers or salesmen with impure water. Europe had depots in 1890s, but Straus' is the first in the United States. These depots remain in operation until 1920. Miller argues: "Straus was motivated to act on the milk question at this particular time not because of any dramatic rise in infant mortality, but because public knowledge about the advances of bacteriology and sanitation of the late nineteenth century (which were in fact causing infant mortality to decline) made the deaths of children less tolerable." This division into sanitary districts division became a precursor to district health administration. Deputy Registrar Robert S. Tracy, began to collect statistical information regarding disease among "groups of people of like race and nationality living under similar conditions." (Weinstein, 129) Israel Weinstein, "Eighty Years of Public Health in New York City," *Journal of Urban Health: Bulletin of the New York Academy of Medicine*, 77 (2000), 121- 136. Reprinted from: 23(1947): 221-237.

governments to begin to invest more money into public water supplies.[125] The handling of the cholera quarantine of 1892 and Daly's Raids of 1893 both illustrate the broadening role of government in public health. In 1892, the Board of Health successfully disseminated important information about cholera as a water-borne illness, which resulted in an increased public understanding of the necessary precautions to prevent spread of the disease.[126] Preventing an outbreak of cholera prompted the Webster Act and Daly's Raids. The city government took the lead in protecting the watershed, using the new germ theory as its rationale and common sense about filth removal as its modus operandi. The New York Academy of Medicine wanted to be involved in the sanitation efforts in the Croton watershed, but the city government took the lead without them. Elites called out for physicians' judgment on the issues, but it was a ward politician who implemented the sanitary measures.

Despite anti-machine sentiment, city officials desired to demonstrate immediate and forceful action. Whether or not Daly's aggressive actions in the Croton watershed were rash ultimately does not matter. What is important is the dramatic assertion of power on the part of city government demonstrated by Daly's Raids. The brash behavior of Daly and his crew garnered attention. To city officials, eliminating pollutants from the drinking water supply in a time of cholera mandated brute force. A lack of action marred prior attempts at the protection of

[125] Daniel T. Rodgers, *Atlantic Crossings: Social Politics in a Progressive Age* (Cambridge: Harvard University Press, 2000), 115.

[126] Despite dissemination of information on germ theory in the 1890s, it is interesting to note that miasma theory persisted at end of nineteenth century and into the twentieth century in the public consciousness. In a letter to the editor of the New York Times, Charles F. Wingate complained about the "recent revelations of neglect in camps and hospitals" which served as evidence for ignorance and apathy regarding public health. He recounted that "…One finds intelligent people sleeping with closed windows, even in mild weather, and vast numbers see no harm in living over a damp cellar. I recently came upon a score of clerks and typewriters in the basement of an old office building which was redolent with foul odors, yet their employer was surprised that sickness had incapacitated half of the force." Note that there is still concern about odor causing disease as late at 1898 when this had already been disproven by germ theory a decade earlier. "In an exclusive summer cottage community," the author continued, "drinking water was until lately served "a-la-cart" and the odors from drains were a constant source of complaint." ("Sanitary Ignorance," Charles F. Wingate, December 15, 1898, *New York Times*, 6.)

the drinking water supply by State Board of Health in New York. The definitive effort of Daly's Raids was a performative demonstration of the power of government. The cast of characters in charge of this operation, a city official, a lawyer, an engineer, and an army of laborers, served to preempt any questioning of the government's ability and its legal authority to act. There was little faith in the city government to handle the operation. Furthermore, by seizing private property, the city was seen as overreaching its domain. The Webster Act and Daly's Raids represented concerted efforts at policy-making and implementation in order to safeguard New York City's water supply. Yet, greater centralization of government power would be required in the near future to cement this somewhat shaky beginning.

The process of acquiring power was a legislative one, but even with the laws in place, the city's authority was consistently criticized during this period. Doctors disagreed with city officials about appropriate measures for sanitation and disease prevention, property owners fought with the government over the sanitary code, and the newspapers challenged experts and laypeople on both sides of the issue. Regardless of this dissent, the city moved ahead. Cholera prevention allowed the city government to assert its newly acquired legislative power to protect the Croton watershed upstate as the source for New York City's drinking water.

Without pure water brought from upstate, the city of New York could not thrive. The rural landscape was altered dramatically in order to support the city and modernization of the country became a prerequisite for that process in the city. In the study of New York and water, we cannot understand the city downstate without understanding the country upstate. In his book *Nature's Metropolis: Chicago and the Great West* historian William Cronon argues that the urban and the rural must be studied together in order to properly understand either

environment.[127] While cities did shape the countryside, the reverse also occurred. Cronon cites one long-term resident of Chicago stating in 1893 that "the cities have not made the country. On the contrary, the country has compelled the cities …Without the former the latter could not exist. Without farmers there could be no cities."[128] Similar to Cronon's interpretive framework, beginning with the first Croton Aqueduct completed in 1842, city life was inextricably linked to the country. The city became more and more connected to the country with each expansion of the water system and catchment area throughout the nineteenth and twentieth centuries from Croton, to the Catskills, to the Delaware system. This connection was starkly visible from the countryside perspective.

Historians have argued that when cities changed from private to public management of water depended on when water became seen as "a 'common good' to the entire city" and that this shift often depended upon the advent of reform government.[129] However, in the case of New York, some of the most important developments in public health and the permanent shift to public water both happened under the political machine of Tammany Hall and not under reform government. It is this subject of urban politics and public works in New York's water history that the following chapter addresses.

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[127] William Cronon, *Nature's Metropolis: Chicago and the Great* West (New York: W.W. Norton, 1992). Cronon wants to understand "how a city's life and markets connect to the countryside around it" and he shows that "the geography of capital produced a landscape of obscured connections" between city and country.
[128] Cronon, *Nature's Metropolis*, 97. Cronon sees this phenomenon as particularly applicable to Chicago. To illustrate this connection, he studies commodity flows of grain, lumber, and meat because "few (other) economic institutions more powerfully affect human communities and natural ecosystems in the modern capitalist world."
[129] Kate Foss- Mollan, *Hard Water: Politics and Water Supply in Milwaukee, 1870-1995* (West Lafayette: Purdue University Press, 2001), 27-28.

CHAPTER 4: Political Scandal and the Struggle for Legitimacy, 1898-1901

"If ever there is to be a Greater New-York,
it is the water question which is the main difficulty."[1]

On the night of December 31, 1897, a colorful fireworks display, a cannon salute, and a grand parade marked the birth of the newly consolidated City of New York. Despite sleet and rain, crowds lined the streets surrounding City Hall to cheer the wheelmen, soldiers, and firemen, who rode and marched in the parade. An enormous float depicting the Brooklyn Bridge on which actors staged a wedding of Father Knickerbocker to Mrs. Brooklyn wove its way along the parade route. At midnight, the flag of the City of New York unfurled over City Hall. With the push of a button, James D. Phelan, the mayor of San Francisco, released the flag remotely from 3,700 miles away.[2] "We have raised the flag," proclaimed Mayor Phelan, "Keep it there for a united country; no North, no South, no East, no West."[3]

On January 1, 1898, Manhattan and its surrounding areas merged to form the City of New York, following a ten-year path toward consolidation. New York had become the world's second largest city after London.[4] Creating the Greater New York Charter meant forging one governmental system for the several diverse cities and communities that would comprise five boroughs of Manhattan, Brooklyn, Bronx, Queens, and Richmond.[5] The mayor, elected for four-year terms, sat at the top of the new city government. This model vested the mayor with the executive power to appoint all department heads, except the Comptroller, who was to be elected separately. The previously established Board of Estimate and Apportionment continued to

[1] "No Water for Fountains," *New York Times*, February 16, 1896, 23.
[2] "The New City Ushered In," *New York Times*, January 1, 1898, 1.
[3] "New York Is the World's Second City," *San Francisco Chronicle*, January 1, 1898, 1.
[4] "New York Is the World's Second City," *San Francisco Chronicle*, January 1, 1898, 1.
[5] "Vast Power of the Mayor," *San Francisco Chronicle*, January 1, 1898, 1.

manage the city's budget. The city government's legislative branch included the Board of Aldermen and a Council of Members, with elected seats on each board. A borough president led each borough, overseeing the local boards within it. The city-wide Board of Public Improvements managed the Departments of Bridges, Buildings, Lighting, Sewers, Street Cleaning, and Water Supply. While the State Legislature had previously been the seat of authority, the Greater New York Charter strengthened the power of the municipal government.[6]

With consolidation, city officials could see that the Croton watershed would not provide sufficient water for the new city. The needs of Brooklyn's rapidly growing population already surpassed its available water supply. Brooklyn did not draw water from the Croton system at this time; rather, its water came from the aquifers of Long Island. Before consolidation, Brooklyn's reliance on underground water caused well water to be drawn down to levels so low that extensive pumping was required. Such pumping continued to lower water tables, causing wells to become contaminated with seawater.[7] After consolidation, Brooklyn was to benefit from New York City's present and future water supply.

A new bureaucratic structure for water accompanied consolidation. Under Section 457 of the Greater New York Charter, several existing agencies from Manhattan, the City of Brooklyn, and Queens county were to be combined to comprise the new Department of Water Supply (DWS). These agencies to be merged included the Bureau of the Chief Engineer of the Croton Aqueduct, the Bureau of Water Register (from the City of New York), the Department of City Works (from the City of Brooklyn) and, "all public property …connected with the water supply" (from Queens and Richmond). Manhattan and the Bronx had been under the same water

[6] I.N. Phelps, *The Iconography of Manhattan Island, 1498-1909*, volume 3, (Robert H. Dodd: New York, 1918), 798 -801.
[7] Kevin Bone, Gina Pollara, Albert F. Appleton, editors, *Water-works : The Architecture and Engineering of the New York City Water Supply*, (Monacelli Press: New York, 2006), 106.

management system since 1873. With consolidation, the remaining boroughs, which had been separate cities with their own water systems, were to be brought under the umbrella of one unified, publicly managed entity to oversee water supply and distribution.[8]

Yet even as the government merged agencies to centralize operations, many private water companies continued to operate throughout the boroughs, both in supply and distribution. One particular private corporation, the Ramapo Water Company, grabbed the city's attention when it announced that it could supply water sufficient for each of the five boroughs and it could do so very quickly.[9] It sounded too good to be true and it was. This chapter investigates the high-profile political scandal involving this company in order to understand its impact on the city's transition to public water.

Mapping Eminent Domain

The Ramapo Water Company was organized under the 1848 Manufacturing Act, which authorized private companies to collect, store, sell, and supply water to cities for "mining, domestic, manufacturing, municipal and agricultural purposes."[10] In order to do so, these companies were granted the right to acquire land by condemnation, in a similar manner to how railroad companies operated. However, the act clearly stated that it did not allow for companies to be organized under its auspices if they intended to supply water to the City of New York for municipal purposes. Amendments passed in 1883 and 1884 removed this restriction allowing private water companies to supply water to any city in New York State, including the City of

[8] *First Annual Report of the Department of Water Supply of the City of New York, 1898* (New York: Martin B. Brown Company, 1899), 3.
[9] David Stradling, *Making Mountains: New York City and the Catskills* (Seattle: University of Washington Press, 2007).
[10] *An Inquiry into the Conditions Relating to the Water-Supply of the City of New York,* Merchants' Association of New York. New York, New York, 1900, 597.

New York. Furthermore, these amendments authorized the City of New York to contract with private water companies.[11] These changes to the law were made with the express purpose of facilitating a contract between the Ramapo Water Company of New Jersey, the predecessor to the New York corporation with the same name, and the City of New York.[12]

In 1887, the Ramapo Water Company offered to provide the city with additional water from Orange and Rockland counties in New Jersey to supplement the Croton supply.[13] Due to various legal issues, this effort eventually came to naught. In 1890, the sections of the Manufacturing Act of 1848 pertaining to water companies were repealed. At the same time, new, more stringent restrictions were implemented related to contracts between municipalities and private water companies. The acts of 1883, 1884, and 1890 meant that the Ramapo Water Company was the only water company qualified to contract with the City of New York.[14] The tide had already turned in the company's favor when another act, meant to restrict its authority, greatly expanded it.

On June 11, 1895, the State Legislature passed Chapter 985 of the Laws of 1895. Although titled, "An Act to Limit and Define the Powers of the Ramapo Water Company," this act granted the company sweeping authority to condemn and acquire land along the New York section of the Ramapo River.[15] The Ramapo River runs through Orange County in southern New York and flows south into Harriman County, Rockland County, and Bergen County in New

[11] *An Inquiry into the Conditions Relating to the Water-Supply of the City of New York,* Merchants' Association of New York. New York, New York, 1900, 597.
[12] Letter to Honorable B.B. Odell Jr. from The Merchants' Association, September 7, 1900, New-York Historical Society.
[13] Stradling, *Making Mountains*, 146.
[14] Letter to Honorable B.B. Odell Jr. from The Merchants' Association, September 7, 1900, New-York Historical Society.
[15] *An Inquiry into the Conditions Relating to the Water-Supply of the City of New York,* Merchants' Association of New York. New York, New York, 1900, 598.

Jersey.[16] Section 5 of Chapter 985 granted the Ramapo Company "full power to contract to supply water" to municipalities, without obtaining the consent of local authorities.[17] "The power to supply water for municipal purposes," the act continued, "and in addition the power to supply water for commercial uses is given by this special act and is a power which no corporation can obtain except by special legislation and is an exclusive power of the Ramapo Company."[18] This act allowed the Ramapo Water Company to purchase land, to determine its own route for conveying water, and to sell water to any public or private entity. Furthermore, the law granted the company the right to lay pipes to transport its water under any of the streams of New York state, meaning that the company could now pipe water from the western side of the Hudson River to the City of New York.[19] The Laws of 1895 greatly enhanced the Ramapo Company's power of eminent domain. Eminent domain refers to the power to seize private property for public use by a state, a municipality, a corporation, or a private individual, without the consent of the property owner. The party exercising eminent domain is required to pay just compensation to the property owner for any property seized.[20] By granting a private company such broad powers, this act greatly undermined New York City's own rights to obtain water.

It is essential to emphasize that the city had possessed the power of eminent domain to allow it to acquire land for water supply through condemnation prior to this point. The New York City Consolidation Act, passed in 1882, granted this power to the city.[21] Section 364 of

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[16] Diane Galusha, *Liquid Assets: A History of New York City's Water System* (Fleischmanns: Purple Mountain Press, 2002), 89.
[17] *An Inquiry into the Conditions Relating to the Water-Supply of the City of New York,* Merchants' Association of New York. New York, New York, 1900, 601.
[18] *An Inquiry into the Conditions Relating to the Water-Supply of the City of New York,* Merchants' Association of New York. New York, New York, 1900, 601-602.
[19] "Queer Ramapo Company: What Gave Rise to Reports that Platt Was Interested," *New York Tribune*, August 20, 1899, 1.
[20] Farlex Legal Dictionary, accessed January 10, 2012, http://legaldictionary.thefreedictionary.com/eminent+domain
[21] *An Inquiry into the Conditions Relating to the Water-Supply of the City of New York,* Merchants' Association of New York. New York, New York, 1900, 602.

this act clearly stated that the Commissioner of Public Works of the City of New York was authorized "to acquire all rights, titles, and interests in and to such real estate" to be taken for the purposes of supplying water to the city.[22] However, two subsequent legislative acts specifically prohibited the city from expanding its authority with regard to water supply, thereby undermining the rights conferred by the Consolidation Act. First, the Suffolk County Act of 1896 forbade the city from taking water from Suffolk County, Long Island, since supervisors in that county had filed a certificate stating that waters in the county were needed for county residents. This certificate exempted these waters from condemnation by the city.[23] Second, the Greater New York Charter of 1897 limited the city's powers of condemnation for water supply. Section 484 of the Charter retained the powers of the Consolidation Act to acquire land for water supply, but Section 472 of the Charter stated that the city could not seize property or utilize watersheds to supply the city with water if other towns were already using those watersheds. This new restriction meant that a private company operating in a certain county could prevent the city from obtaining rights to such water supplies. Combined, the Suffolk Act and the City Charter drastically reduced the city's power to obtain its own water.[24]

But how could this have happened? How was it possible that the State Legislature had passed laws to curtail city powers and to enhance those of one private water company? In short, it was an inside job. Support for these acts came from the political allies of Commissioner of Water Supply William Dalton and President of the Board of Public Improvements Francis

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[22] *New York City Consolidation Act, as in force in 1891: with notes indicating the statutory sources, references to judicial decisions, and all laws relating to New York city, passed since January 1, 1882, together with an appendix of the royal English colonial charters of New York city,* Mark Ash of the New York Bar (Albany: Weed, Parsons and Company, 1891), 174.

[23] *An Inquiry into the Conditions Relating to the Water-Supply of the City of New York,* Merchants' Association of New York. New York, New York, 1900, 603.

[24] Nelson Blake, *Water for the Cities: A History of the Urban Water Supply Problem in the United States*. (Syracuse: Syracuse University Press, 1956), 278. See also "Ramapo Water Company Contract Rushed by Platt," *New York Times*, June 20, 1895. *An Inquiry into the Conditions Relating to the Water-Supply of the City of New York,* Merchants' Association of New York. New York, New York, 1900, 603.

Holahan, who each had a personal vested interest in executing a contract between the Ramapo Company and the city. Dalton, Holahan, and their political allies, including Republicans in the State Legislature and Tammany Hall Democrats in the city government, stood to become very rich men, due to an elaborate system between these politicians and the Ramapo Water Company which provided kickbacks and company stock in exchange for yes votes on pro-Ramapo legislation. It would take four years for this inside job to surface and even longer to undo the scheme. As the scheme unraveled, the top dogs of the two political machines, Republican Thomas C. Platt and Democrat Richard Croker, were each exposed as the masterminds, pulling the strings of the whole operation.

With its newly acquired power, the Ramapo Water Company began purchasing land in the Catskills in order to build seven dams and a pipeline to transport water to the city. By 1899, the company's civil engineer, Peter Nostrand, had negotiated contracts with many property owners in the Catskills watershed to acquire their lands once the city approved a contract with the company. He paid them signing bonuses up front. At this time, state law required that maps be filed if a company intended to build in a designated area. Nostrand filed the relevant maps at Ulster County to support the Ramapo Water Company's planned reservoir near Esopus Creek. Once the maps were on file, the company submitted its proposed contract to the city's Board of Public Improvements for approval.[25] The relationship between these maps and eminent domain would prove crucial years later in court.

Given the restrictions preventing New York City from harvesting new sources of water, the increased need for water because of consolidation, and the Ramapo Water Company's newfound leverage, the stage was set for a major showdown between private and public

[25] Stradling, *Making Mountains,* 146-147.

management of water.[26] City and state politics further escalated this volatile environment. Political divisions ran deep in 1890s New York and machine politics were well-entrenched. Republicans dominated the State Legislature. The city government was under Democratic rule with Mayor Robert van Wyck, a Tammany Hall Democrat, as the first mayor after consolidation. For the purposes of this study, a good working definition of machine politics is "patronage based political systems where the government dispensed private favors in exchange for votes and governed not through the legislative process but through back-room deals between the "boss" and interested parties."[27] At this time, there were two political machines, the Republicans of the state and the Democrats of the city.

At the head of the state Republican machine stood Thomas C. Platt, whose moniker was the "Easy Boss." He served three terms in the Senate and two terms in the House of Representatives. Platt was known for his role of "putting the screws on the legislature (to) force the Greater New York contract through."[28] Richard Croker ruled the city's Tammany roost. Boss Croker was called the "Master of Manhattan" because of his influence over Tammany Hall. Croker shepherded Tammany Hall into its "most diabolical phase" through graft involving the police force, gambling, and prostitution, while simultaneously solidifying Tammany's relationship with business.[29]

In 1899, as state Republicans and city Democrats vied for power, the private Ramapo Water Company joined the fray over water management, as did the City Comptroller, Bird S.

[26] *Merchants' Association of New York, An Inquiry into the Conditions Relating to the Water-Supply of the City of New York. New York, New York, 1900,* 597-604.
[27] Rebecca Menes, "Corruption in Cities: Graft and Politics in American Cities at the Turn of the Twentieth Century," (Cambridge: National Bureau of Economic Research, 2003), 2.
[28] "Progress and Fall of Platt, Easy Boss," *New York Times,* June 7, 1910, 2.
[29] Oliver Allen, *The Tiger: The Rise and Fall of Tammany Hall* (Reading: Addison-Wesley, 1993), ix –x.

Coler.[30] Nominated in 1897 on Van Wyck's mayoral ticket, Coler had been handpicked by Croker. Croker was seeking to solidify his influence in Brooklyn by making appointments that provided political connections between Brooklyn and New York, one year prior to consolidation. In a surprising choice, Croker selected Coler, an inexperienced young man from Brooklyn, mostly unknown in political circles beyond Brooklyn.[31] Coler was the first to hold the new position of City Comptroller after consolidation.[32] He became the Ramapo Water Company's fiercest opponent.

Water Fight: The Comptroller and the Press vs. the Ramapo Company

"Whiskey is for sipping and water is for fighting." – Mark Twain

"I was excited yesterday," Coler told a *Brooklyn Eagle* reporter on August 17, 1899. "It is the first time I have ever lost my temper at a public meeting, and I regret it, but I think the circumstance was in a measure provocative."[33] The Comptroller was referring to his uncharacteristic outbursts at a meeting of New York City's Board of Public Improvements. Coler had just learned the previous day that the Board planned to make a major decision affecting the city's financial welfare and water supply without his involvement. He arrived at the meeting "ready for a fight and was not disappointed."[34]

[30] Bird S. Coler is not remembered today, except perhaps by the hospital that bears his name on Roosevelt Island. Born in Champaign, Illinois on October 9, 1867, Coler and his family relocated to Brooklyn, where Coler attended Polytechnic Institute, before leaving for Andover, Massachusetts to attend Phillips Academy. After graduating from Andover in 1888, instead of enrolling at college, Coler moved back to Brooklyn to work for this father's banking and brokerage firm, W.N. Coler and Company. (See "Bird S. Coler Dies: Ex-Controller, 73," *New York Times*, June 14, 1941, 17).
[31] David Rosner, *A Once Charitable Enterprise: Hospitals and Health Care in Brooklyn and New York, 1885-1915* (Princeton: Princeton University Press, 1982).
[32] "Bird S. Coler Dies: Ex-Controller, 73," *New York Times*, June 14, 1941, 17.
[33] "Ramapo Water Fight: Coler Says He Will Investigate and Is Opposed to Contract, Anyhow," *Brooklyn Eagle*, August 17, 1899, 1.
[34] "Coler and Shea Oppose Ramapo Water Supply," *Brooklyn Eagle*, August 17, 1899, 7.

During the meeting, William Dalton, Commissioner of Water Supply, and Francis Holahan, President of the Board of Public Improvements, attempted to force the city to agree to an expensive forty-year contract with the private Ramapo Water Company. The contract stipulated that the company would supply the city with 200 million gallons of water per day at the rate of seventy dollars per million gallons.[35] At this rate, the city would be paying the company fourteen thousand dollars per day or five million, eleven hundred thousand dollars per year. Over the course of the forty-year contract, the city would pay $204,400,000, an excessive amount for water supply. For comparison, the average approximate cost per million gallons of water in the city system in 1898 was $29.07. The Ramapo contract would charge $70 per million gallons and in order to accurately project actual cost, a $10 per million gallons was added to cover the cost of distributing water to consumers, for a total cost of $80 per million gallons.[36] Figure 4.1 illustrates this comparison.

[35] "Coler Blocks Plan to Fix Water Deal: Attempt to Rush City into Contact with Ramapo Company," *New York Times*, August 17, 1899, 1

[36] *An Inquiry into the Conditions Relating to the Water-Supply of the City of New York,* Merchants' Association of New York. New York, New York, 1900, 7.

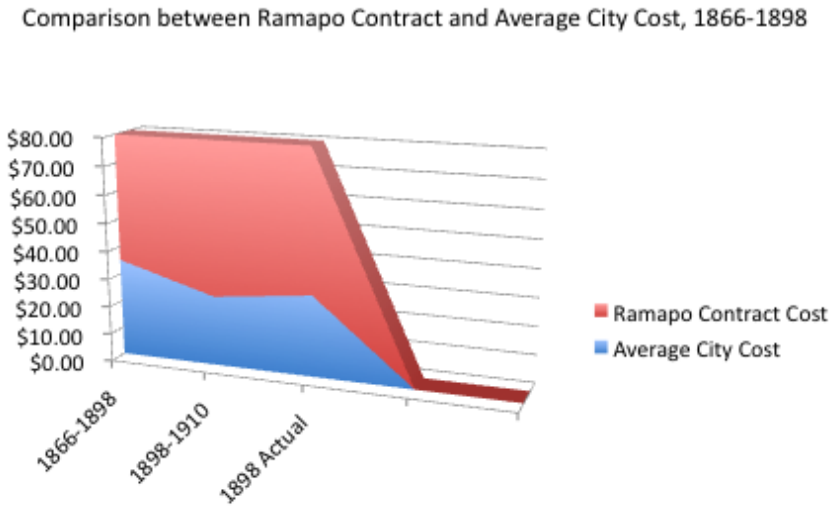

Figure 4.1: Comparison of Ramapo Contract Cost of $80 per million gallons and average city rate. Numbers from *An Inquiry into the Conditions Relating to the Water-Supply of the City of New York,* Merchants' Association of New York. New York, New York, 1900, 7.

In the meeting about the contract, Dalton and Holahan neglected to mention that the contract also allowed the Ramapo Water Company to borrow extensively from the city treasury.[37]

Counting on the Board's Tammany majority, Holahan and Dalton insisted that the contract be approved at once. Coler, Bridge Commissioner John L. Shea, and their supporters refused to support the measure, which prompted the "fiercest [fight] of the many which [had] taken place in the Board."[38] When challenged about the contract, Holahan responded by pounding the desk with his fist. He exclaimed that because the newspapers had been attacking Tammany Hall for its delay on the water question action must be swift. Shea responded that he

[37] In 2011, the relative value of $200,000,000.00 from ranges from $4,790,000,000.00 to $155,000,000,000.00 Measuring Woth.com, Accessed June 8, 2012, http://www.measuringworth.com/
See http://eh.net/hmit/compare. "Fight Against Ramapo: Coler Presents Arguments to Board of Public Improvements," *Brooklyn Eagle*, August 30, 1899, 2. "Ramapo Job May Fail: Aroused Public Sentiment May Defeat the Proposed Steal," *New York Tribune,* August 18, 1899, 2.
[38] "Coler Blocks Plan to Fix Water Deal: Attempt to Rush City into Contact with Ramapo Company," *New York Times,* August 17, 1899, 1.

was uneasy with the Ramapo plan since he did not know if the people behind it were honest or not. Furthermore, he felt that water should be owned and managed by the municipality and not by a private company. Holahan responded to Shea that the city could not afford to build its own waterworks because the city's debt limit would not allow it. Coler countered that the debt limit did not apply to improvements in water supply. Holahan retorted that he knew this fact, but that all other public improvement projects would have to cease were the city to pursue supplying additional water itself. When Holahan pressed Coler to cite the amount of the current debt margin, Coler responded that he could not give the exact figures offhand. "You will not give the figures?" Holahan challenged. "Not unless you give me a month's time." Coler snapped.[39]

Coler demanded that more time be given to the matter of the Ramapo contract in order to make a sound decision. Holahan insisted that allowing for additional time was impossible. Coler accused Holahan of trying to sabotage city engineers by not allowing them to investigate the matter. He charged that the Ramapo scheme was "nefarious," that the city would be unable to meet the financial obligations of the contract, and that Holahan, Dalton, and their supporters were guilty of "undue secrecy" in trying to force the contract's approval. A motion for a one-month stay of the contract was made and lost, due to a tie vote of six to six. A second motion for a three-week delay was also defeated. In the end, the Board voted unanimously to grant a two-week postponement of the proceedings to give Coler time to investigate. Had Coler and Shea not strenuously objected to the proceedings, the contract would have been signed that day.[40]

Directly following the contentious August 16, 1899 meeting, Coler and his engineers began their work. "As far as lies in our power," Coler told *The Brooklyn Eagle* on August 17,

[39] "Coler Blocks Plan to Fix Water Deal: Attempt to Rush City into Contact with Ramapo Company," *New York Times*, August 17, 1899, 1.
[40] "Coler Blocks Plan to Fix Water Deal: Attempt to Rush City into Contact with Ramapo Company," *New York Times*, August 17, 1899, 1.

"we are going to investigate this water question fully, and for this purpose we will obtain the services of the best engineers that can be found."[41] On August 18, 1899, Coler wrote to Silas B. Dutcher, President of the Ramapo Water Company, requesting that the following documentation be sent to him at once: the company's financials, its list of watersheds to be drawn upon, proof of the company's right to do so, engineers' reports showing how the water was to be conveyed to the city, and estimates of costs and timelines for the project.[42] Coler then hired external consulting engineers to work on the water investigation while he and his fiscal staff compiled figures on city's finances to be presented to Board of Public Improvements in two weeks time.[43]

During the summer of 1899, all the major New York City newspapers ran front-page articles on the Ramapo water story as it unfolded. On August 17, 1899, the entire text of Ramapo contract appeared in *The Brooklyn Eagle. The New York Times* printed a full transcript of the August 16 meeting.[44] *The New York Tribune* covered the August 16 meeting in detail with illustrations (figure 4.2) of who voted for and against the Ramapo contract.[45]

[41] "Ramapo Water Fight. Coler Says He Will Investigate and Is Opposed to Contract, Anyhow," *Brooklyn Eagle*, August 17, 1899, 1.
[42] Bird S. Coler, Comptroller, to Silas B. Dutcher, President, Ramapo Water Company, dated August 18th, 1899; New-York Historical Society.
[43] "Coler's Men at Work on Ramapo Contract: Engineers and Experts Trying to Dig Out Facts on Which to Fight." *Brooklyn Eagle,* August 18, 1899, 2.
[44] See "Ramapo Water Fight. Coler Says He Will Investigate and Is Opposed to Contract, Anyhow," *Brooklyn Eagle*, August 17, 1899, 1 and "Coler Blocks Plan to Fix Water Deal: Attempt to Rush City into Contact with Ramapo Company," *New York Times*, August 17, 1899, 1.
[45] "Queer Ramapo Company: What Gave Rise to Reports that Platt Was Interested," *New York Tribune,* August 20, 1899, 1.

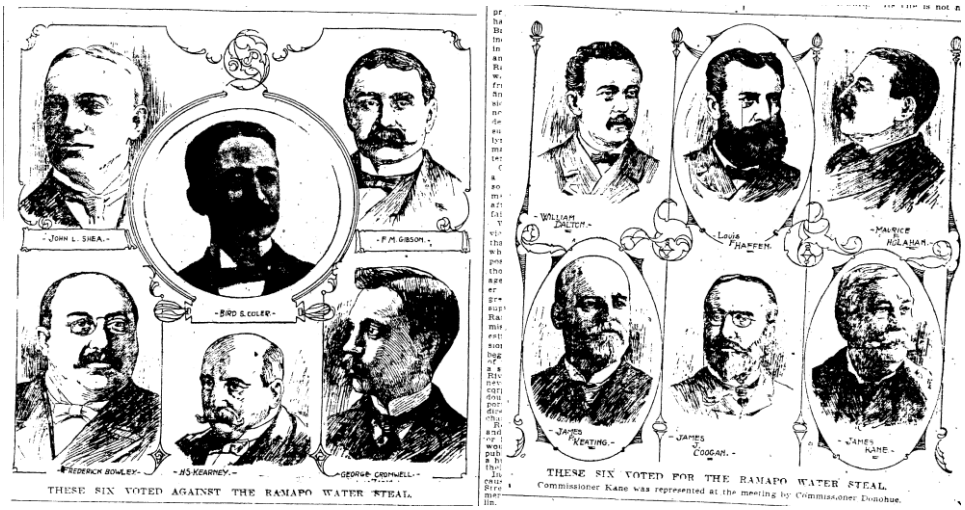

Figure 4.2: "Queer Ramapo Company: What Gave Rise to Reports that Platt Was Interested," *New York Tribune,* August 20, 1899, 1.

Front-page articles ran in *The New York Herald, The New York Post, The Brooklyn Citizen, The New York Sun, and The New York World.* Proclaiming it was rare for New York journalists to unite on an issue, *The New York Tribune,* considered a Republican paper, stated that "every newspaper of importance in this city has denounced the Ramapo water scheme editorially."[46] This consensus in the press supports the trend of decreasing partisanship in newspapers. In 1899, many editors believed that a partisan paper would have a shorter shelf life than an independent paper. In truth, many newspapers maintained their political loyalties, but editors made a concerted effort not to appear to be in the pockets of politicians.[47] An increase in journalistic crusades in the 1890s replaced partisanship.[48] Larger circulation numbers and more

[46] N.W. Ayer & Son's American newspaper annual. The Library of Congress -- accessed, September 20, 2011. http://lcweb2.loc.gov/diglib/vols/loc.gdc.sr.sn91012091/default.html ."Ramapo Job May Fail: Aroused Public Sentiment May Defeat the Proposed Steal," *New York Tribune,* August 18, 1899, 2.

[47] Gerald J Baldasty, *The Commercialization of News in the 19th Century* (Madison: University of Wisconsin Press, 1992), 127-128.

[48] In 1899, American journalism was at a point of transition, moving away from partisan allegiances and towards more objective news coverage. Between 1872 and 1892, the independent press began to take shape. Political parties dominated newspapers in the 1870s, making these newspapers seem extremely partisan. Yet, a decade later, as stories focused more on human interest, the pronounced political partisanship in newspapers declined. As this New Journalism emerged, with Joseph Pulitzer of *The World* at its forefront, broader crusades that sought to correct local abuses replaced the previous skirmishes between political parties. From 1892 to 1914, characteristics of this

newspapers meant a larger platform for journalistic crusades.[49] While far-ranging campaigns for social justice had occurred previously, most notably in *The New York Times* effort to bring down the Tweed Ring in the 1870s, the 1880s and 1890s witnessed a greater prevalence of crusades that stretched beyond political loyalties.[50] The efforts to prevent the contract between the city and the Ramapo Water Company became one of these crusades and their support of the press was crucial to Coler's battle against the company.

Journalists reporting on the Ramapo scandal used charged language. *The New York Times*, when presenting its transcription of the August 16 meeting, referred to Holahan having "wrathfully retorted" and "replied curtly," as "growing red in the face" and "tattooing" the desk with his pounding fist. Such explosive descriptions are not used when referring to Coler and Shea. Rather, Shea was referred to as speaking "quietly and in most conciliatory terms."[51] Such descriptors indicated the newspapers' allegiances with Coler and Shea's side in the Ramapo caper. Most importantly, the press exposed the secrecy that had masked the Ramapo scheme. Coler and Shea had not known about the August 16 meeting in advance. This meeting had been scheduled while Brooklyn Borough President Edward M. Grout, a known Ramapo opponent, would be away in Europe. James Moffett, the Deputy Commissioner of Water Supply for Brooklyn, did not know about the Ramapo plan until he read about it in *The Brooklyn Eagle* on

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journalistic trend, sometimes called Yellow Journalism, included large print headlines, a greater number of photographs, a sensationalized tone, and a tendency to side with the underdog. William Randolph Hearst's tenure at *The Journal* which began in 1895 falls within this period as does the Ramapo Water Company episode. See Frank Luther Mott, *American Journalism: A History: 1690-1960* (New York: MacMillan, 1962), 411-414. Matthew Gentzkow, Edward L. Glaeser, and Claudia Goldin. "The Rise of the Fourth Estate: How Newspapers Became Informative and Why It Mattered," in Glaeser, Edward L. and Goldin, Claudia, editors. *Corruption and Reform: Lessons from American Economic History.* (Chicago: University of Chicago Press, 2006), 187-230.

[49] It is extremely difficult to determine readership from circulation numbers.

[50] Mott, *American Journalism,* 414.

[51] "Coler and Shea Oppose Ramapo Water Supply: Action Delayed on Department's Plan to Make a Contract with the Company," *Brooklyn Eagle,* August 17, 1899, 7.

August 17.[52] An article titled, "The Biggest Steal of All," which ran in *The New York Times* on August 19, 1899, reported that by finding out about the meeting in time to attend it and by preventing the execution of the contract at that meeting, Coler had caught "the thieves at their dark game and had turned upon them the terrible light of publicity."[53]

Allegations of political corruption were rampant. "If the safes of the members of the Legislature could be opened," cautioned an anonymous Albany source, "they would be found to be papered with the stock of the Ramapo Water Company."[54] Republicans Thomas C. Platt and Lemuel E. Quigg denied any connection to the Ramapo Company. Yet, Silas B. Dutcher, President of the Ramapo Water Company, was known to be a "Platt-Quigg Republican of prominence."[55] The fact that the Ramapo Water Company obtained its eminent domain rights to New York land through the bill passed by the Republican legislature cast doubt on Platt and Quigg's protestations of innocence.[56] Republicans were not the only ones accused of graft. Local Democrats were also suspect in the Ramapo scandal. On August 18, *The New York Tribune* reported:

> Holahan has the Ramapo brand on his forehead. So has Water Commissioner Dalton. So has Corporation Counsel Whalen. What will Croker do? If Croker 'calls down' Holahan, Dalton, and Whalen in this Ramapo steal they will sneak around a corner like whipped curs. Irreverent politicians were calling Holahan, Dalton, and Whalen yesterday Ramapo Holahan, Ramapo Dalton and Ramapo Whalen.[57]

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[52] "Ramapo Water Fight. Coler Says He Will Investigate and Is Opposed to Contract, Anyhow,"*Brooklyn Eagle*, August 17, 1899, 1. See also "Platt and Hobart in Ramapo Scheme: Alleged Deal with Croker to Call off Mazet: Secrecy of Design Proved," *The New York Times*, August 18, 1899, 1.
[53] "The Biggest Steal of All," *New York Times*, August, 19, 1899, 6.
[54] "Water Company's Backing: Friend of Platt and Croker Deny Any Combination," *New York Times*, August 19, 1899, 3.
[55] "Ramapo Job May Fail: Aroused Public Sentiment May Defeat the Proposed Steal," *New York Tribune*, August 18, 1899, 2.
[56] "Ramapo Job May Fail: Aroused Public Sentiment May Defeat the Proposed Steal," *New York Tribune*, August 18, 1899, 2.
[57] "Ramapo Job May Fail: Aroused Public Sentiment May Defeat the Proposed Steal," *New York Tribune*, August 18, 1899, 2.

This quotation provides a good example of the evocative language of crusading journalists as they railed against political corruption.

Using such sensationalized language, the press reported daily on the findings of the investigation. Coler and his allies adeptly used this press coverage to call for reform. When a *Brooklyn Eagle* reporter asked Coler why he thought the six Tammany Democrats voted to endorse the Ramapo Water Company, whose directors were said to be Republicans, he replied, "Read Bret Harte's poem about the Heathen Chinee... the action of these men was like the Chinee's, 'peculiar.'"[58] In this poem, "The Heathen Chinee" also called "Plain Language from Truthful James" written by Bret Harte and published in 1870, several Californian miners are outsmarted by a Chinese man in their efforts to cheat him at cards.[59] The poem became popular worldwide. Perhaps Coler mentioned this poem when asked about possible collusion of Democratic politicians with a Republican-run company because the poem is about people trying to cheat someone, but they are then outsmarted by an even more talented cheater.

Given that the Ramapo episode involved a private company working together with corrupt politicians, Coler's reference to this well-known poem highlighted the scale of the dishonesty and graft at play. Coler's commentary published in the news served to emphasize the potential dangers of private company involvement in water. His crusade against the Ramapo contract lent further support to the need for sufficient municipal power and public management of water in order to prevent such scams. Coler repeatedly called on the general public for their aid against the Ramapo contract. "I want the support of the people in this fight," he stated "It is one of the heaviest that has ever fallen on my shoulders, and I want it made known that I want

[58] "The City Water Supply, Croker's Friends Pushing the Ramapo Scheme," *New York Evening Post,* August 17, 1899, 1.
[59] For the full text of the poem, see *The Overland Monthly Magazine* (September 1870) Accessed September 22, 2011. http://etext.virginia.edu/railton/roughingit/map/chiharte.html

support." [60] Coler felt that support from the people would make a difference in this struggle, for he believed that the general public was against the private ownership of water.[61] The crusade against the Ramapo scheme is perhaps best portrayed in a cartoon (figure 4.3) that appeared in *The New York World* on August 18, 1899 accompanying the article titled, "Public In Arms Against Ramapo Deal."[62]

Figure 4.3: "Plugged," *The New York World*, August 18, 1899, 12.

In this cartoon, we see Coler with his mallet that identifies him as the Comptroller in the act of plugging the water spigot with a stopper marked "vigilance." The two figures on the right appear to be Platt (left) and Croker (right) who each press down the handle to pump the Ramapo water. The sign over the water bucket reads "Our own bucket all the time." In this cartoon, Platt and Croker are unable to draw any water because Coler's vigilance has stopped them. This image depicts the essence of the Ramapo story, namely that government had to be vigilant in order to

[60] "Ramapo Water Fight. Coler Says He Will Investigate and Is Opposed to Contract, Anyhow," *Brooklyn Eagle*, August 17, 1899, 1.
[61] "The City Water Supply, Croker's Friends Pushing the Ramapo Scheme," *New York Evening Post,* August 17, 1899, 1.
[62] "Public in Arms Against Ramapo Deal," *New York World*, August 18, 1899, 12.

keep the management of water out of the hands of crooked politicians and corrupt private water companies.

Coler's vigilance was widely recognized. His office received an outpouring of encouragement in the form of hundreds of letters of support from "prominent and public spirited citizens."[63] Many of these letters were reprinted in the newspapers, which continued to support Coler's efforts. Some citizens offered to hold public meetings and to use their various organizations, including the Citizens' Union and the Knights of Labor, to bolster Coler's fight. [64] On August 25, 1899, *The Brooklyn Eagle* reprinted in full a letter of support from the Knights of Labor to Coler. The end of the letter read: "We believe that your action is in accord with the platform upon which you have been elected and we are more than surprised to learn that men calling themselves Democrats should lend themselves to a proposition to surrender a public utility of such vast importance to our citizens to a mere handful of speculators."[65] As the public outcry about collusion between Croker's Tammany Democrats, Platt's State Republicans, and the Ramapo Water Company escalated, businesses that had been in favor of the Ramapo contract withdrew their support.[66] Coler became a popular hero.

While enjoying positive press coverage and awaiting a written response from Dutcher, Coler further investigated the legal issues relevant to the case. The main legal issue concerned Ramapo's claim to exclusive rights to land and how this claim was related to the city's power of eminent domain.[67] As previously mentioned, Section 472 of the City Charter prohibited the city from acquiring land in watersheds for water supply if other towns were already using these

[63] "Coler's Hands Upheld: Hundreds of Letters Pour in to Encourage Him," *New York Tribune,* August 20, 1899, 1.
[64] Among these organizations were the Citizen's Union (See "Water Company's Backing: Friend of Platt and Croker Deny Any Combination," *New York Times*, August 19, 1899, 3) and the Knights of Labor (See "Storage Reservoirs Needed" *Brooklyn Eagle*, August 25, 1899, 1).
[65] "A Big Water Surplus," *Brooklyn Eagle*, August 25, 1899, 1.
[66] Blake, *Water for the Cities*, 279.
[67] "Illegal Says Dillon: Former Charter Commissioner Sends Coler an Opinion on Ramapo Contract: No Exclusive Water Rights," *Brooklyn Eagle*, August 23, 1899.

watersheds, a severe restriction to the city's powers of eminent domain. Private companies were not limited in this same way. On August 21, 1899, Coler told *The Brooklyn Eagle*:

> Much more important to this municipality than the outcome of the present struggle is the question of eminent domain, the right of the city to acquire property for its own protection... Just as soon as this present water question is definitely settled by the engineers, a bill will be framed for the legislation giving the city at least the same rights as are now enjoyed by private corporations.[68]

Eminent domain became one of the most important issues of the Ramapo chapter and the continuous press coverage helped to raise public awareness about this matter.

On August 22, 1899, Coler reiterated the importance of eminent domain to *The New York Times*, saying that his fight would continue until the City of New York had the right to acquire land for water supply. He explained that despite repeated efforts to repeal the laws that restricted the city's involvement in water supply, these laws remained active, "mainly through the machinations of the Ramapo Company." Coler concluded by saying:

> This question has more behind it than any that has come before the people in years, and I do not doubt that if the entire truth were revealed, a scandal, which would make the Tweed Ring look like a glorified angel by comparison would result. I am firmly convinced that when the enormity of the steal is shown, the people will demand that no man be elected to the Legislature except on a platform which specifies that the city's water supply shall be owned exclusively by the city.[69]

Alongside eminent domain, constitutionality was crucial to Coler's efforts to defeat the Ramapo contract. While Section 419 of the Charter of Greater New York required that the Mayor and the Comptroller vote on legal contracts when being awarded to a bidder who was not the lowest bidder, Section 471 of the Charter empowered the Commissioner of Water Supply to

[68] "Can Vote Down Ramapo Says Comptroller," *Brooklyn Eagle*, August 21, 1899, 1.
[69] "More Light Shed on Ramapo Grab," *New York Times*, August 22, 1899, 1.

execute contracts, requiring only the approval of the Board of Public Improvements.[70] It was under the auspices of Section 471 that William Dalton, Commissioner of Water Supply, and Francis Holahan, President of the Board of Public Improvements, attempted to execute the contract between the city and the Ramapo Water Company. Section 471 of the City Charter allowed the Commissioners and the President to secure water for the city by making a contract with a private individual or a private company, with no veto allowed for by the Mayor, Comptroller, the Municipal Assembly, or the Board of Estimate and Apportionment.[71]

Of special note was the fact that Section 471 included specific language in order to avoid conflict with Section 419 and to assure that Section 471 may trump Section 419. Section 471 reads:

> It shall not be lawful for the commissioner of water supply to enter in to any contract whatever with any person or corporation engaged in the business of supplying or selling water for private or public use and consumption, unless, preliminary to the execution of the contract, the assent of the board of public improvements, after submission to it of the proposed contract in all its details, shall be given by resolution to the execution of such contract as submitted, and it shall not be lawful for the said city of New York or for any department thereof, to make any contract touching or concerning the public water supply, and especially the increase thereof, with any person or corporation whatsoever, save in accordance with the provisions and requirements of this act, which said provisions and requirements are hereby declared to establish the exclusive rule for the making of such contracts.[72]

[70] *Greater New York Charter*, 207. "Water Company's Backing: Friend of Platt and Croker Deny Any Combination: Republican Machine's Work: Positive Assertion that Bribes Forced Ramapo Legislation Through the Assembly – Mr. Coler Investigates," *New York Times,* August 19, 1899, 3.
[71] "Queer Ramapo Company: What Gave Rise to Reports that Platt Was Interested," *New York Tribune,* August 20, 1899, 1.
[72] *Greater New York Charter as enacted in 1897 and revised in 1901: as further amended by subsequent acts, down to and including the year 1906. With notes indicating the derivatory statutes and references to judicial decisions relating thereto, together with appendixes ... and the English colonial charters,* Mark Ash of the New York Bar (Albany: Weed, Parsons and Company, 1897).

General Tracy, the former President of the Ramapo Water Company, was involved in drafting this section of the Charter in 1897 and he assured that the language would facilitate the future rise of his company.[73]

Coler and his allies needed to confront the contract issue as outlined in the City Charter in order to defeat the Ramapo Company. Coler told T*he New York Times* that if the report that he and his team were preparing for the August 30 meeting did not prevent Dalton and the Board of Public Improvements from signing the Ramapo contract, he had a back-up plan. He would file an injunction to attack both the constitutionality of the Ramapo Water Company's charter and the right of the Board of Public Improvements to sign a contract such as this one "which is manifestly against public policy."[74]

To win the day, Comptroller Coler needed to demonstrate that private ownership of the city's water would prove more expensive in the long run and that the city had the money to build additional infrastructure for water supply.[75] In order to do so, on August 24, Coler commissioned master engineer, John R. Freeman, to produce an official report on the status of the city's water. Coler wanted a "fair minded determination of the truth by an engineer familiar with the water supply and removed from local prejudices."[76]

On August 25, Coler received Dutcher's reply to his letter of August 18. In his response, Dutcher provided a general defense of the Ramapo Water Company and its contract. He informed Coler that the proposal had been submitted seventeen months earlier and that a full presentation on the proposal was made by the Board of Fire Underwriters to the Board of Public

[73] "Queer Ramapo Company: What Gave Rise to Reports that Platt Was Interested," *New York Tribune,* August 20, 1899, 1.
[74] "More Light Shed on Ramapo Grab," *New York Times*, August 22, 1899, 1
[75] Kevin Bone, Gina Pollara, Albert F. Appleton, editors, *Water-works : The Architecture and Engineering of the New York City Water Supply.* Monacelli Press: New York, 2006, 108.
[76] Charles H. Weidner, Water for a City: A History of New York City's Problem from the Beginning *to the Delaware River System* (New Brunswick: Rutgers University Press, 1974), 150.

Improvements fourteen months earlier. All that remained was for the city to accept or reject the company's offer. Dutcher stated that the Ramapo Water Company proposal was created in response to a petition dated June 14, 1898 representing 1200 property owners, taxpayers, and merchants. The Board of Fire Underwriters circulated this petition, which called for an increase of water supply, and then presented it to the Board of Public Improvements. Further, Dutcher argued, the newspapers had been decrying the lack of quality and quantity of water supply for months. He had a solution to the problem, namely, the Ramapo contact, which would allow the city to obtain an increased water supply without increasing its burden of debt.[77]

With regard to costs, Dutcher explained that the estimated cost of constructing the water works was $70,000,000 to $100,000,000, but that it might cost more than that due to unpredictability of expenses. Given that the New Croton Aqueduct and reservoir were slated to cost $16,500,000 but had already cost $39,000,000, Dutcher pointed out that Ramapo pipelines would be three times the length of the Croton Aqueduct, implying that costs could escalate. The city could not possibly construct these waterworks on its own because to do so would require increasing the debt limit above the constitutional limit and that the increase would need to be paid in principal and interest from taxes within twenty years.[78] The Ramapo Water Company had no debt and the capital stock of the company was $2,500,000 as listed in the certificate of incorporation. In short, Dutcher deemed the Ramapo Water Company's financial ability to be sufficient to meet the costs of the project. He explained that the city would not be asked to incur any expense, except paying for the water after it was delivered to the city. In this way, the construction of the waterworks would serve as the security for the city, since the company would

[77] Dutcher to Coler, dated August 25, 1899; New-York Historical Society.
[78] Dutcher to Coler, dated August 25, 1899; New-York Historical Society.

forfeit its bond if it failed to construct the works.[79] The letter closed by stating that the maps and plans were "too voluminous to be copied and that they are the private property of the company."[80] Rather, the company's engineers would give Coler's engineers only that data that could be made public.[81] With this letter, which Coler called "foxy and misleading," Coler did not receive the information he had requested.[82] Yet, because *The Brooklyn Eagle* printed the entire text of Dutcher's letter on August 26, the public had a chance to reach the elusive letter for themselves.

And then the day arrived. On August 30, interested citizens packed into the Board of Public Improvements' meeting room.[83] Coler was the first speaker to address those assembled. "First," Coler began his ten-point argument against the Ramapo contract,[84] "… the supplying of water to large cities by private companies has everywhere throughout the civilized world proved a failure as compared with municipal ownership of water supply."[85] Here Coler was referring to the rise in public ownership of water in the late 19th century. In the 1890s, 43% of American water systems were publicly owned and by the 1920s, this would increase to 70%. Coler argued that the city would pay an excessive price for water through the Ramapo contract. Moreover, at the conclusion of the forty-year contract, the city would have nothing to show for its expenditures because it would not own any infrastructure. Rather, the city would become increasingly dependent "on the mercy of private interests grown enormously powerful by the aid of the

[79] Dutcher to Coler, dated August 25, 1899; New-York Historical Society.
[80] Dutcher to Coler, dated August 25, 1899; New-York Historical Society.
[81] Dutcher to Coler, dated August 25, 1899; New-York Historical Society. *The Brooklyn Eagle* printed the full text of Dutcher's letter on August 26, 1899.
[82] "A Reply to Mr. Dutcher," *New York Times*, August 27, 1899, 4.
[83] "More Light Shed on Ramapo Grab," *New York Times*, August 22, 1899, 1.
[84] These ten points were later published as part of an essay on water supply in Coler's book. See Bird S. Coler, *Municipal Government* (New York: D. Appleton and Company, 1901).
[85] "Fight against Ramapo: Coler Presents Arguments to Board of Public Improvements," *Brooklyn Eagle*, August 30, 1899. David Cutler and Grant Miller, "Water Water Everywhere: Municipal Finance and Water Supply in American Cities, in *Corruption and Reform: Lessons from American Economic History*, National Bureau of Economic Research, University of Chicago Press, 2006, 168.

municipal treasury."[86] Coler emphasized that if the contract was approved, the city would still have to pay a substantial price for the water once it arrived (see figure 4.1). He maintained that the current lack of water had been grossly exaggerated by proponents of the contract and that a sufficient water supply for Manhattan and the Bronx already existed within the Croton watershed.

Next, Coler delivered his statement on the city's financial status.[87] After accounting for the city's existing contracts, Coler had calculated that the sum available in city budget to be spent on new improvements was twenty-two million dollars. Coler emphasized the fact that the city had never spent more than $4,500,000 in one year's time on water supply, even in the whole construction of the Croton system, which made the $5,000,000 per year of the Ramapo contract suspect.[88] Coler pointed out the "absurdly small bond" to be required of the Ramapo Water Company if a contract were signed. Under the contract, the company would receive $200,000,000 from the city and it would be required to give a bond of just $100,000.[89] For the sake of comparison, the courts had required the contractor hired to build the Rapid Transit, which would cost fifty million dollars to give a bond of fifteen million dollars.[90] Regarding the financials of the contract, the former City Works Commissioner of Brooklyn, Alfred T. White, provided perhaps the most succinct summary, when on August 24, 1899, he told *The Brooklyn Eagle:* "From the Ramapo and the Ten Mile River Districts, the city could obtain two hundred

[86] "Fight against Ramapo: Coler Presents Arguments to Board of Public Improvements," *Brooklyn Eagle,* August 30, 1899.
[87] "Economy of a City Plant," *Brooklyn Eagle,* August 30, 1899, 1.
[88] "Fight against Ramapo: Coler Presents Arguments to Board of Public Improvements," *Brooklyn Eagle,* August 30, 1899.
[89] "Queer Ramapo Company: What Gave Rise to Reports that Platt Was Interested," *New York Tribune,* August 20, 1899, 1. For information on the Ramapo Water Company's prior attempt to gain position as sole provider of the city's water, see "Coler's Fight with Ramapo Plotters: Attack on Constitutionality of the Company's Charter," *New York Times,* August 20, 1899.
[90] "Queer Ramapo Company: What Gave Rise to Reports that Platt Was Interested," *New York Tribune,* August 20, 1899, 1.

million gallons of pure water a day by a total expenditure of $35,000,000. The Ramapo Company asks the city to spend $200,000,000 in the course of forty years and at the end of that time have nothing. That's the situation in a nutshell."[91] The Ramapo episode provided an extreme example of the possible perils of outsourcing water to a private company, especially in that the city would not have had control of the water infrastructure. Building and owning its own infrastructure would become an essential feature of securing public water for the City of New York.

Most importantly with regard to budget, the city was in a position to issue municipal bonds to provide the necessary funds for construction and operations so that the city could extend and manage the water system by itself without such a contract with a private water company. Lastly, Coler stressed that the constitutional amendment slated to take effect in November which would exempt county debts from the calculation of the city's debt limit would have a significant effect on city budget by raising the margin to $52,000,000 balance by the end of 1899. This amount, added to the $13,000,000 revenue from the sinking fund, would mean the city would have $65,000,000 to use for this purpose by year's end.[92] It was no accident that a comptroller became the main opponent of the Ramapo contract for the financial argument against it was a strong one.

Next, the engineers, George S. Rice, James R. Croes, and Eugene E. McLean, presented their reports. Rice stated that Ulster County's Esopus Creek was not well-suited to a reservoir and that it would not be an adequate source to provide the five boroughs the volume of water that the company had promised. Croes reported on the present status of the city's water supply and

[91] "Full Ramapo Supply at a Cost of $35,000,0000: Alfred T. White Says the City can Secure the Whole System at that Price," *Brooklyn Eagle*, August 24, 1899, 1.
[92] A sinking fund is money set aside to help repay a bond at a future time. "Fight against Ramapo: Coler Presents Arguments to Board of Public Improvements," *Brooklyn Eagle*, August 30, 1899.

he recommended that the city increase its efforts to conserve water. He also argued that the city must be granted the authority to investigate other external water sources, beyond the Croton watershed. Croes emphasized that any new waterworks "should be controlled, owned, and constructed by the City of New York and not by private corporations over which the city has no control."[93] McClean, the last engineer to present, showed that a huge additional supply of water was not needed immediately for Manhattan and the Bronx, as had been argued by the Ramapo supporters. He maintained that there was time for the city to build its own waterworks.[94]

In defense of the Ramapo plan, Water Commissioner Holahan invited testimony from members of the Fire Department, who each cited the need for more water, especially in Brooklyn. Then Holahan took the stand himself. As he attempted to clear his name from criticism, his testimony became more of a personal tirade than a substantive defense of the contract. Next Bridge Commissioner John L. Shea surprised the room by putting forth a resolution endorsing public water for the city. The resolution read:

> Resolved, that it is not in the public interest or for the public weal, neither is it necessary that the city should contract with a private corporation for its supply of water: that upon expiration of the term of the existing contracts for such purpose proceedings should be taken to acquire the rights of the persons or corporations holding or owning any such rights, to the end that the municipality shall own its water system exclusively.[95]

In a dramatic move, Shea asked for an immediate vote on the resolution. Holahan suggested that the resolution should include the caveat that the city would pursue such public waterworks only if it could afford them. Shea denounced this idea, arguing that the resolution was "a declaration of our principles" and that were it to be amended to be contingent on finance, Shea would withdraw it. For Shea, the ability of the city to afford to pay for the waterworks was a non-issue.

[93] "Ramapo Grab Gets its Death Thrust," *New York Times*, August 31, 1899,12.
[94] "Ramapo Grab Gets its Death Thrust," *New York Times*, August 31, 1899, 12.
[95] "Ramapo Grab Gets its Death Thrust," *New York Times*, August 31, 1899, 12.

If municipal funding was short, the city and state would find a way to raise funds itself without relying on a partnership with a private company. Water was to be public, financial details notwithstanding. The members voted and passed the resolution by five votes to two, with Dalton and Holahan opposing.

The information gathered in the two-week investigation and presented at the August 30 meeting was sufficient to allow several simultaneous legal actions.[96] On the same day as this meeting, Holahan and the Board of Public Improvements were served with writs of injunction forbidding either party from taking any action on the Ramapo contract.[97] On the night of August 30, a large public meeting organized by *The New York Journal* convened at the Cooper Union.[98] Three thousand citizens attended to cheer on Coler and his allies.[99]

In September, investigating attorney, Frank Moss, began to subpoena witnesses in the legal proceedings connected to the injunctions to be heard by the Mazet Committee, a State body convened to investigate certain city departments post consolidation.[100] Seth Low testified before this committee, showing that the Charter of Greater New York did not allow for the Board of Public Improvements to make contracts for water. On the contrary, the charter specifically mandated that water contracts were to be made by the city.[101] Coler testified as well, calling the Ramapo Water Company "a menace" to the City of New York. On the pro-Ramapo side stood Croker, who's glib reply during these hearings became famous. When questioning Croker about the link between political appointments and fees, Moss asked Croker, "You are working for your own pocket, are you not?" Croker replied, "All the time, the same as you."[102] Croker's quip

[96] "Ramapo Case in Court," *Brooklyn Eagle*, September 15, 1899, 1.
[97] Charles H. Weidner, *Water for a City*, 148.
[98] "Ramapo Grab Gets its Death Thrust," *New York Times*, August 31, 1899, 12.
[99] "Big Meeting to Protest," *New York Tribune*, August 31, 1899, 1.
[100] *Bulletin of the New York Public Library* (New York: Astor Lenox and Tilden Foundations, 1901).
[101] "Ramapo Stockholders Identity Is Concealed," *Brooklyn Eagle*, September 19, 1899, 1.
[102] Allen, Oliver, *The Tiger: The Rise and Fall of Tammany Hall* (Reading: Addison-Wesley, 1993), 177.

made the headlines the next day – "Croker Preaches the Sermon on the Text, "I Am Working for My Pocket All the Time."[103] Croker's nonchalant admission of graft and his implicit accusation of similar behavior on the part of municipal officials seems a fitting encapsulation of the Ramapo incident.

The investigation revealed that the Ramapo Water Company had given stock as a gift to those members of the State Legislature who had voted in favor of bills which aided the company. During the Mazet Committee hearings, Moss had intended to reveal the names of all of the Ramapo Water Company's stockholders. However, he was blocked in this effort by the company's lawyer, Edward Lauterbach, who refused to release the names. This refusal was seen as a major set-back for Moss, since publishing this list of stockholders was to be his "biggest card" and "the star play of the investigation."[104] In the absence of the list of names, Moss turned his attention to the violation of procedures involved in the handling of the Ramapo contract, which proved a fruitful approach in the end.[105] The battle was not yet won and reinforcements were needed. In November 1899, William Randolph Hearst joined the effort to obtain a Supreme Court order to dissolve the Ramapo Water Company. [106] That same month, the Merchants' Association, a group of distinguished New York businessmen, lent their support to the Coler and his allies. They agreed to conduct, at their own expense, an independent three-month investigation of Ramapo Water Company.[107]

Prior to committing to this investigation, the Merchants' Association had published a broadside titled "Octopus Ramapo" in 1895, which explained that the former City of New York

[103] "Moss Reviews his Work," *New York Tribune*, November 6, 1899.
[104] "Ramapo Stockholders Identity Is Concealed," *Brooklyn Eagle*, September 19, 1899, 1.
[105] As mentioned, Seth Low's testimony was key to supporting the argument that the presentation of the Ramapo contract for approval was not allowed under the charter.
[106] "To Dissolve Ramapo Company," *Brooklyn Eagle*, November 12, 1899, 1.
[107] "Merchants' Association to Make An Inquiry," *Brooklyn Eagle*, November 16, 1899, 1 and "Ramapo Matter Delayed: Merchants' Association is Given Three Months to Investigate Water Supply," *Brooklyn Eagle*, November 23, 1899, 15.

had possessed the right of eminent domain to condemn land for water supply. However, the Greater New York Charter Commission removed this right when it drafted the Charter for Greater New York. Showing how conflict of interest led to foul play, the Merchants' Association was quick to point out that the former and present presidents of the Ramapo Water Company, Benjamin F. Tracy and Silas Dutcher, were both members of that Commission."[108] As the investigation of the Ramapo Water Company began, Governor Theodore Roosevelt wrote to the Merchants' Association to praise them for this undertaking. In this letter, Roosevelt condemned the Ramapo contract as "grossly improper" and decried the behavior of city politicians as "actual criminality."[109]

In the meantime, Engineer Freeman submitted his report to Coler on March 23, 1900. The Freeman Report proved that the city was consuming more water than it had at hand. Waste of water continued to be a significant problem and the Freeman's remedy for this was metering all water taps.[110] But, even if the waste of water were reduced, the city would have enough water for only five more years. In his report, Freeman emphasized this dire situation and called for the city to build a new water infrastructure in a five-year period.[111] Freeman recommended the two rivers near the Croton watershed as potential new water sources, since these seemed to be the "cheapest and best by far" of all the sources he had investigated.[112] His report addressed every potential water source, with the exception of the Delaware River.[113]

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[108] "Octopus Ramapo!" Broadside published and circulated by the Merchants' Association of New York, c. 1895, New-York Historical Society.
[109] Merchants' Association of New York, *An Inquiry into the Conditions Relating to the Water-Supply of the City of New York* (New York, 1900), xxxvi.
[110] Weidner, *Water for a City*, 156.
[111] Bone et al, eds., *Water-works*, 108-109.
[112] Weidner, *Water for a City*, 151.
[113] Freeman even contemplates filtering water from the Hudson River as an option. Weidner, *Water for a City*, 157. For a summary of Freeman's main recommendations, see Weidner, *Water for a City*, 156.

On March 29, 1900, the Merchants' Association sent a letter to Governor Theodore Roosevelt outlining the findings to date of the investigation into the dealings of the Ramapo Company. In this letter, which was printed in full in *The New York Times* on March 31, 1900, the Merchants' Association showed how Dalton, Holahan, and other city officials had prepared laws which prevented the city expanding its own water supply and had tried to force the city into an improper contract with the Ramapo Water Company.[114] In his reply of April 6, 1900, Governor Roosevelt thanked the Association for their work so far and urged them to continue their investigation. Since some city officials had sought to thwart the city's power to obtain water, it was only natural," wrote Roosevelt, "that the country members should object to seeing these same officials against whom so heavy an indictment is framed made supreme over the water systems of the country counties."[115] The governor stated that in such a case, the best hope for change rested with the State Legislature and the Executive. Since the State could examine the relevant issues concerning the expansion of water supply from both the city's point of view and the country's perspective, it could impose conditions deemed wise for both parties. "When it is necessary thus to invoke the aid of the State," Roosevelt wrote, "and when the legislation asked for is to benefit a city by means of works carried into various counties, then it is well worth considering whether or not the legislation should be of such a character as will permit these counties a voice in the matter." He continued, "if Manhattan and Brooklyn are to draw their water supplies from Dutchess or Rockland, or Suffolk or Essex, then the question of home

[114] "Urge Pressing Need of Anti-Ramapo Measure: Merchants' Association Appeals to Governor for Morgan Bill," *New York Times*, March 31, 1900, 6.
[115] Request of Governor Roosevelt That the Work of the Committee on Water Supply Be Continued, letter from Governor Roosevelt to the Merchants' Association, April 6, 1900. Published in Merchants' Association of New York, *An Inquiry into the Conditions Relating to the Water-Supply of the City of New York* (New York, 1900), xxxv-xxxvii.

rule is quite as important to these counties as to the two great metropolitan boroughs."[116] The city needed the State's assistance with these matters of home rule in order to assure the success of its efforts to increase the amount of water being transported from the country to the city.

In August 1900, the Merchants' Association published their independent report, which called for the rejection of the contract on many grounds. Most convincingly, the report argued that financially, the agreement with the Ramapo Water Company would be a terrible deal for the city. Under the Ramapo contract, water would cost about $80 per million gallons ($70 paid to the company and $10 for distribution of the water). With the city collecting only $50.29 per million gallons in revenue, it stood to lose $30 per million gallons. However, under the mostly municipal system in place in 1898, water cost only $29 per million gallons, leaving the city with a profit of over $21 per million gallons.[117] In light of these calculations, the report of the Merchants' Association's Committee on Water Supply stated that "the City's water works are not a burden, but a source of profit."[118]

The report advocated for a system wholly run by the city emphasizing that:

> …other municipalities in the United States, as well as in other countries, show an almost continuous tendency to substitute publicly owned water systems for private, a tendency so persistent and so universal, and of such constantly increasing force, that the wisdom, in the public interest of the policy of municipal ownership and control of water supply, would seem established by abundant experience.[119]

The Merchants' Association called upon the legislature to grant the city the power to acquire the property that it needed for water supply.[120] The investigation of the Ramapo Water Company revealed that it possessed only $5,000 in assets with which to deliver the two hundred million

[116] Request of Governor Roosevelt That the Work of the Committee on Water Supply Be Continued, letter from Governor Roosevelt to the Merchants' Association, April 6, 1900. Published in Merchants' Association of New York, *An Inquiry into the Conditions Relating to the Water-Supply of the City of New York* (New York, 1900), xxxv-xxxvii.
[117] Merchants' Association of New York, *An Inquiry*, 531.
[118] Merchants' Association of New York, *An Inquiry*, 533.
[119] Merchants' Association of New York, *An Inquiry*, 20.
[120] Merchants' Association of New York, *An Inquiry,* 21.

gallons of water a day it promised. Furthermore, it accused the Ramapo Water Company of intending to swindle the city out of $5,000,000 through collusion certain members of the Board of Public Improvements.[121]

In the Ramapo episode, some politicians strove to turn control of water supply over to a private company, while some businessmen lobbied for municipal ownership.[122] A few corrupt Democrats and Republicans sought to fund their political lives through kickbacks from the Ramapo Company while the businessmen of the Merchants' Association strove to achieve clean government and to assure that water would be municipally run. With the backing of the Merchants' Association report, Coler and his allies succeeded in thwarting the contract with "a company which was controlled by politicians and had not a reservoir, a pump, or a pipe."[123] Coler and his allies were victorious. An article in *The Independent,* summarized Coler's career to date, saying:

> He has become the champion of the people against the foul aggregation known as Tammany government of New York and in opposing the coarse greed and iniquitous jobs of Croker's tools, he has shown unfailing courage, tireless energy, broad conception of municipal development, and a wise conservatism which is not always displayed by men of his age who are promoting reform.[124]

Although not cast as a reformer, Coler became one. Though never referred to explicitly as a "progressive" [125] by contemporaries, Coler adhered to some of the main tenets of reform ideology. He believed in a strong, centralized "progressive government," with the Mayor and

[121] David Rosner, *A Once Charitable Enterprise: Hospitals and Health Care in Brooklyn and New York, 1885-1915* (Princeton: Princeton University Press, 1982), 130.
[122] Blake, *Water for the Cities*, 279.
[123] "The Young Comptroller of New York," *The Independent,* 51, December 28, 1899, 3504-3505.
[124] "The Young Comptroller of New York," *The Independent,* 51, December 28, 1899, 3504-3505.
[125] The definition of the term "progressive" has been debated by historians and its meaning remains contested and unclear in the historiography. The term was not used formally until used to refer to the Progressive Party in 1912. For an excellent overview of progressive movement historiography, see Daniel T. Rodgers, "In Search of Progressivism," *Reviews in American History,* Vol. 10, No, 4. (December, 1982): 113-132. For a reflection on the limits of viewing disparate reform movements as one "progressive movement", see Peter G. Filene "An Obituary for 'The Progressive Movement'," *American Quarterly,* Vol. 22, No. 1. (Spring, 1970): 20-34.

Comptroller in charge. He argued that in order to make government more efficient, the proliferation of legislation and of agencies must stop. "Too many laws and too little public and political honesty are directly responsible for most of the bad government that has damaged and disgraced American cities,"[126] he wrote in 1900. Coler viewed the involvement of the people as crucial players in government. He called on the people to elect "good men" as the best way to achieve change, but he also saw the involvement of experts in political decision-making as essential.[127]

Because Coler was a reformer who operated within the Democratic political machine, he reveals the inaccuracy of a dichotomy between political machine and reformer.[128] Coler supported the progressive ideas of "good government," as being more than anti-corruption, pro-efficiency, and pro-frugality.[129] "The true economy in municipal business consists in getting the best value for the money expended, not always in spending less,"[130] Coler wrote in 1901. Issues of who had power, what were considered legitimate uses of city resources, how to involve the people in politics, and municipal ownership were all essential for Coler.[131]

The Ramapo scandal raised questions about how to assure good government and about who was fit to govern. In a hearing about the company held January 23, 1901, William F. King, President of the Merchants' Association of New York, described how he and his fellow

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[126] "Charter Needs of a Great City," by Bird S. Coler, *The North American Review*, Volume 170, Issue 523, June, 1900, 850-857.
[127] "When the People Nominate," by Bird Coler, *The Independent*, November 30, 1899, 3210-3211.
[128] Many Democratic machine politicians in reform efforts, showing that the former divide between machine and reformer does not always hold since many Democrats in the parties made certain reforms happen. See John D. Buenker, *Urban Liberalism and Progressive Reform*, New York: Scribner's, 1973.
[129] David Rosner, *A Once Charitable Enterprise*, 130.
[130] "Mistakes of Professional Reformers," by Bird S. Coler, *The Independent*, June 20, 1901, 1405-1406.
[131] None of Coler's political beliefs of his were known when he entered politics, however. Prior to this appointment as the first City Comptroller, Coler's only political involvements had been joining the Democratic Club of Brooklyn's old Twenty-third Ward in 1891 and running for Alderman of Brooklyn in 1892. Although Coler was defeated in this race, his showing in the race raised awareness about him and he began to make a name for himself in Democratic circles within Brooklyn. (See Bird S. Coler Dies: Ex-Controller, 73," *New York Times*, June 14, 1941, 17).

Association members, when fundraising for their investigation of the company, discovered that citizens were afraid to give money to support the cause "lest they bring down upon themselves the wrath of the powers that be."[132] People were scared to speak out for fear of repercussions from politicians. King believed that men who had retired from their business careers were the men who should govern the city and called for the end of political machines. "This association believes New York can be made the most prosperous and most beautiful city in the world," King proclaimed, "and toward this object it bends all its energies. The Ramapo water investigation was an object lesson. It has fulfilled the prophesy that I made to our board at the start, that it would be the beginning of an investigation into the business methods of our city."[133] King was right in that it was this issue of who held the power and how much power they had which would become crucial in the wake of the Ramapo scandal. In short, the Ramapo case revealed that the city and state lacked sufficient power and legal authority to manage the water supply. Significantly, and congruent with progressive idea of stronger government, Coler's battle against Ramapo Water Company led to new legislation that greatly increased government power allowing it to construct a permanent public apparatus to oversee New York's water, once and for all. On February 28, 1901, the Senate passed the bill to repeal the specific privileges granted to the Ramapo Company by the Laws of 1895.[134] On March 19, 1901, the State Legislature repealed both the Ramapo Water Company's charter and the Act of 1895, which had given the company excessive power.[135]

But the Ramapo saga did not end entirely until March 3, 1915 with the verdict of the case of *Ramapo Water Company v. City of New York*. The company had sued the city in a last

[132] "Ramapo Water Hearing," *The Brooklyn Eagle,* January 23, 1901, 16.
[133] "Ramapo Water Hearing," *The Brooklyn Eagle,* January 23, 1901, 16.
[134] "Ramapo Repeal Bill Passed the Senate," *The Brooklyn Eagle,* February 28, 1901, 1.
[135] Litigation in which the Ramapo Water Company tried to overturn the 1901 act continued until 1915.

attempt to recoup monetary losses from the property it had planned to purchase in the Catskills in order to build its waterworks. The Ramapo Company claimed that the maps filed proved the company's right to these lands, which the city had since taken. The judge in the case ruled that the language in the Act of 1895 was not strong enough to indicate that the legislature had intended to confer rights to the company for any land for which it filed a map. Further, he found that the direction was to file a map of the route of the waterworks and the land that would be seized to do so, whereas the company now sought rights to additional land near this route. The case revealed that the company had not officially notified any of the occupants of the land, which was a precondition to any right. Lastly, the court affirmed that "no such right, even for the route of a railroad, is created against the state by the filing of a map."[136] In 1899, the Ramapo Water Company had not delivered any water to New York City. In 1915, the company was officially out of the water business.

Conclusion

The Ramapo scandal was significant because it illustrated the powerful possibilities for large scale graft in water when a private company and corrupt politicians colluded with each other. Municipal graft in the nineteenth century often involved a private company,[137] but the colossal scale of Ramapo scheme set it apart. The way to avoid any future large-scale graft in water was for the city to eliminate private companies, to keep a closer eye on politicians, and to take over management of water. Awareness of the possibility for political corruption with private companies played a significant role in the defeat of the Ramapo contract and in the

[136] Legal Information Institute, Cornell University Law School, accessed January 18, 2012, http://www.law.cornell.edu/supremecourt/text/236/579

[137] Rebecca Menes, *Corruption in Cities: Graft and Politics in American Cities at the Turn of the Twentieth Century*. Cambridge: National Bureau of Economic Research, 2003.

decision to shift to permanent public ownership. Of course, corruption was still a possibility with water under public management. City officials like Coler and Shea hoped in 1899 that contracts and patronage could be more easily monitored under a solely public plan. Coler, Shea, and other opponents of the Ramapo contract used the scandal to demonize the involvement of private companies in water supply and to secure the public management of water.

Common belief renders corruption as extremely detrimental to the functioning of government and to the growth of the economy. Yet, New York grew during the 1890s in leaps and bounds and government functioned smoothly. Some types of graft, like skimming off the top of city contracts, motivated the political machine to expand government services and infrastructure. Bribes involving contracts for new infrastructure were prevalent in many American cities at this time.[138] In short, the politicians' pursuit of "boodle," meaning kickbacks on city contracts, could occur under public water system.[139] Yet, in the City of New York, after Ramapo, key sectors of city government and the public shared an increased awareness of this possibility. The city now needed to create a bureaucratic structure with backing of the state that had the power to operate with mechanisms to prevent municipal graft. Since political machines required a constant source of funds, they tended to surface when there was an opportunity for theft. When these opportunities no longer exist, the machine could not survive. Political machines in urban America declined dramatically after 1920.[140]

Capitalizing on a particular historical moment in 1899, Coler, with the support of a coalition of city politicians, reformers, concerned businessmen, journalists, and the general public, fought and won this campaign against the Ramapo Water Company and its government allies. This coalition used the scandal as an object lesson to achieve lasting reform. The

[138] Menes, *Corruption in Cities,* 19.
[139] Menes, *Corruption in Cities,* 19.
[140] Menes, *Corruption in Cities,* 6-7.

Ramapo case also provides an example of the influence of early "muckraking" journalism. The press coverage of the Ramapo scandal raised public awareness about political corruption, private monopolies, and the need for public water. Coverage of the story was not limited to these days in August 1899. It continued until the Ramapo Company episode ended in 1902 and the legal case resolved in 1915.[141] Historian H.W. Brands called muckrakers an "advance guard of the Progressive movement,"[142] especially relevant in the effort to expose Tammany Hall corruption.

Journalists, reformers, such as Seth Low, and authors, among them James Bryce and E.L. Godkin, took a stance against the political machine in their writings.[143] Bryce penned the often-quoted sentiment about American municipal government as constituting "the most conspicuous failure in America."[144] E.L.Godkin wrote that Tammany Hall was not a political organization, but rather was "an organization of clever adventurers, most of them in some degree criminal, for the control of the ignorant and the viscous vote of the city in an attack on the property of the tax payers."[145] Some members of Tammany Hall noticed the potential damage that could be caused by such negative press, which inspired a counter attack in print. Croker had started a weekly newspaper for the machine called *The Tammany Times* in 1892. Croker also arranged for a history of Tammany Hall to be written, which was then serialized in *The Tammany Times* and published as a book in 1901.[146] Tammany positioned itself against reformers. Platt's attitude toward reformers was encapsulated by his famous and much repeated quotation, "To hell with

[141] The daily coverage occurred from August 1899- 1902, there was also sporadic newspaper coverage that followed the Ramapo Water Company's litigation in attempt to regain its charter until ultimately defeated in 1915.
[142] H.W. Brands, *The Reckless Decade: America in the 1890s* (Chicago: University of Chicago Press, 2002), 98.
[143] William L. Riordon, *Plunkitt of Tammany Hall* (New York: McClure, Phillips & Co., 1905).
[144] James Byrce, *The American Commonwealth* (New York: The Commonwealth Publishing Company, 1908 {1888}).
[145] Riordon, *Plunkitt of Tammany Hall*, 20.
[146] Riordon, *Plunkitt of Tammany Hall*, 21.

reform."[147] In the Ramapo episode, a Tammany Hall appointed comptroller became a reformer alongside journalists and businessmen, who together, in effect, brought down private management of water in the City of New York.

Historian Charles Weidner called the Ramapo Water Company incident a "scandalous prelude to the development of New York City's vast Catskill Mountain system of water supply."[148] Much more than a scandalous prelude, the Ramapo incident provided the necessary push to force city government to ensure water was a publicly managed entity. The scandal's aftermath led to a significant increase in the financial and legal power of city government. To guarantee the sole municipal ownership of water, the city began to take-over private water companies in the boroughs. To become fully public, water would need a much larger and more powerful central apparatus. The next chapter shows how this came about.

[147] Marilyn Thornton Williams, "New York City's Public Baths: A Case Study in Urban Progressive Reform." *Journal of Urban History,* Vol. 7, No. 1, (November, 1980): 49-81. 52.
[148] Weidner, *Water for a City,* 140.

CHAPTER 5: The Power to Act, 1901-1917

"When the well is dry, we learn the worth of water." – Ben Franklin

The Ramapo scandal provided a final and much-needed push to assure the municipal oversight of water in New York City. While anti-monopoly sentiment bloomed later in the Progressive Era, the Merchants' Association identified this phenomenon in 1895 with its broadside about the "Octopus Ramapo." In 1901, *Puck Magazine* picked up on the octopus theme when it published a centerfold cartoon featuring Boss Croker (figure 5.1). In this image,

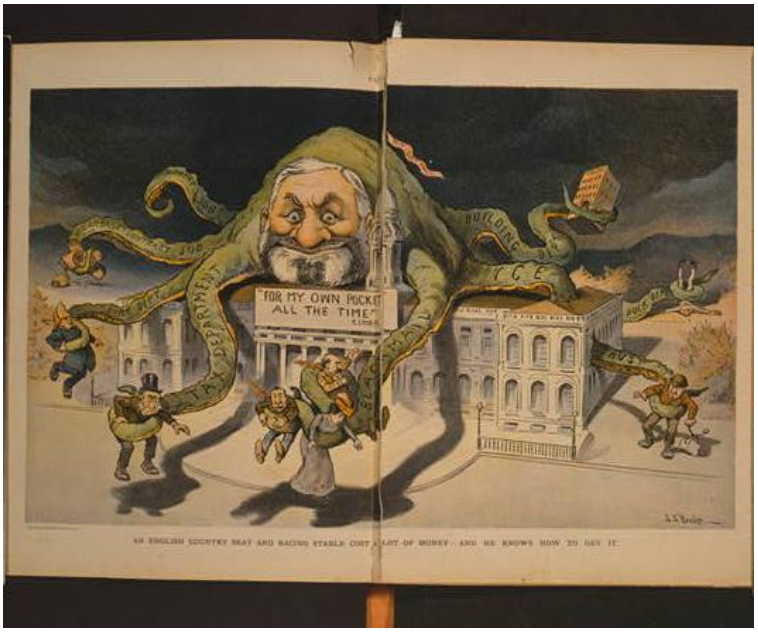


Figure 5.1: An English country seat and racing stable cost a lot of money - and he knows how to get it, J.S. Pughe, Puck Magazine, October 23, 1901, J. Ottmann Lith. Co., Library of Congress Prints and Photographs Division, accessed February 4, 2012, http://hdl.loc.gov/loc.pnp/pp.print.

the octopus has Croker's face and its tentacles of are identified as "Tax Department, Fire Dept., Garbage Contract Job, Ramapo Job, Blackmail, Building Dept., Ice Trust, [and] Dock Dept." The Croker octopus sprawls across City Hall and the sign beneath his beard reads: "For my own

pocket all the time. R. Croker." The title of the illustration refers to the fact that Croker had purchased a country estate in England, called Antwick Manor, and at this estate, he maintained a stable of racing horses. The cartoon suggests that the funding for these personal endeavors came from Croker's various corrupt dealing. From 1882 to 1909, political cartoonists used the image of the octopus to represent the railroad monopoly, the sugar, steel and gas trusts, the New York subway franchise, and Standard Oil.[1] This powerful image of a Tammany Boss as the octopus infiltrating City Hall shows the deep-seated mistrust of municipal government that the City of New York faced in 1901.

Although Coler and his allies prevented the signing of the Ramapo contract in 1899, slaying the Octopus Ramapo for good and making permanent change would take more time. Rejection of the contract cleared the way for the legislative changes that allowed the city to regain the power of eminent domain and to build and maintain the massive Catskills water system. New York's shift to permanent public management of water after the consolidation of the City of New York in 1898 aligned with the creation of the city's new centralized government and it went hand in hand with the expansion of government power in the early twentieth century.

Between 1901 and 1917, New York City solidified the public ownership of water supply. This chapter traces the four major changes in New York City's water bureaucracy during this historical period. First, power became more centralized, with elected politicians, especially the mayor, playing an increasingly important role in public works. Second, changes in municipal finance, such as the exemption of water supply from the city's debt limit, provided the required funds for the expansion of the system. Third, city and state politicians erected a large, complex, and permanent public apparatus to manage water. This new structure included, for the first time,

[1] National Humanities Center, accessed February 4, 2012, http://nationalhumanitiescenter.org/
See nationalhumanitiescenter.org/pds/gilded/power/text1/octopusimages.pdf

a clear division of labor between the different bureaus charged with oversight of water supply and delivery. However, despite unprecedented progress in centralizing the city water supply, many private water companies continued to operate in the boroughs after 1898. The fourth change was that the city began the strategic acquisition of these private water companies. Following consolidation, it took many years to integrate these various water systems into one. An examination of the gradual elimination of private water companies in Brooklyn illustrates the intertwined nature of public and private systems prior to this effort.

As Chapter 4 showed, the Freeman Report and the Merchants' Association Report both bolstered the city's decision to build and manage its own water system. The Merchants' Association Report supported Coler's argument that private water was more costly than public water and advised against any potential contracts with private companies, especially the Ramapo Water Company. The report offered four suggestions regarding finance of water: that bonds used for water supply be exempted from the city's debt limit; that the Comptroller present an annual report on the state of finances for water; that any revenue surplus be directed toward paying the bonded debt; that that the records of the Department of Water Supply be made transparent and public. This report, along with the Freeman Report, set the goals for the city's water supply expansion, although they did not include the actual plans for this expansion.[2]

In 1901, two years after consolidation, the water shortage in the boroughs had not been resolved. Waste of water continued to be a problem. Engineer Birdsall complained that residents left faucets running throughout night during the cold weather to prevent pipes from freezing. He implored the city to act in order to avoid a water famine.[3] The Bronx and Brooklyn

[2] Kevin Bone and Gina Pollara, editors. *Water-Works: The Architecture and Engineering of the New York City Water System* (New York: Monacelli Press, 2006), 109-110.
[3] "Cry for Water in Two Boroughs: Great Hardship Suffered by Thousands of Residents," *New York Times*, February 8, 1901,16.

were in the direst need of additional water supplies. On February 7, 1901, a group of Mount Hope, Bronx, residents visited Mayor Van Wyck to complain about the water shortage, claiming that "there had not been a drop of water" in their neighborhood for days. These residents feared that, given this lack of water, some houses might become so unsanitary that residents would be forced to move out. On February 8, 1901, *The New York Times* reported that 100,000 Bronx residents "went to business unwashed yesterday because there was no water in their houses." In order to acquire sufficient water for washing and cooking, residents would have to stay awake until 3 a.m. and go to their cellars, because there was not enough pressure to force the water up to the first floors, to sit "along side of a pipe and listening intently to hear the rumble of approaching water in the mains before they can go to bed."[4]

Mayor Robert Van Wyck's mayoral term ended in 1901 and with it ended Coler's term as Comptroller.[5] The mayors who followed Van Wyck favored municipal ownership of water. Seth Low of the Reform Party served as mayor from 1901-1903.[6] On December 16, 1902, Mayor Seth Low formed a three-member independent committee on water. In addition to Freeman, Low appointed William Hubert Burr, a civil engineering professor, and Rudolph Herring, a sanitary engineer originally from Germany. He charged the committee with determining how to reduce the waste of water, with estimating future rates of water consumption,

[4] "Cry for Water in Two Boroughs: Great Hardship Suffered by Thousands of Residents," *New York Times*, February 8, 1901, 16.

[5] Coler's term ended, but his political career continued. Coler ran for Governor of New York in 1902, he served as Borough President of Brooklyn from 1906-1909, and he was a candidate for New York State Comptroller in 1918. After his fight against Ramapo, Coler was perhaps best known for his work in reforming public charities, especially hospitals. For more information on Coler's reform efforts of hospitals, see David Rosner, *A Once Charitable Enterprise: Hospitals and Health Care in Brooklyn and New York, 1885-1915* (Princeton: Princeton University Press, 1982).

[6] Seth Low testified against the Ramapo contract in the legal proceedings. See "Seth Low Speaks of Ramapo Contract," *The Brooklyn Eagle*, September 17, 1899, 1.

and with recommending new water sources for short-term and long-term use.[7] Burr, Hering, and Freeman hired a team of expert engineers and divided the work to be done into six departments to include the Aqueduct and Reservoir Department, the Catskill Department, the Filtration Department, the Chemical and Biological Department, the Long Island Department, and the Pumping Department.[8] Each department set about their investigation at once.

On November 30, 1903, the Burr-Freeman-Herring Commission submitted their *Report of the Commission on Additional Water Supply for the City of New York*, a 980-page document, to Mayor Low. The document opened with an overview of the current water supply to the five boroughs in 1903. "The area covered by the present City of New York is about 300 square miles and about one quarter of it only is served with public water supply," the report began.[9] In 1903, water was not fully public. In short, as this report stated, water was privately supplied and distributed in three quarters of Greater New York. The Croton watershed provided Manhattan and the Bronx with 272 million gallons per day, while Bronx and Byram Rivers supplied these two boroughs with 13 million gallons per day. These water sources, the Croton watershed, the Bronx River, and the Byram River in Westchester County, were under the management of the city and state system. Brooklyn relied on surface and ground waters of Long Island, Queens used ground water, and Richmond drew water from wells on Staten Island. Residents of these three boroughs experienced insufficient water quantity and an unsatisfactory quality of water. Private water companies were prevalent in Brooklyn, Queens, and Richmond. As requested by the city, the engineers projected future need for water, based on an estimate of 150 gallons per

[7] *Report of the Commission on Additional Water Supply for the City of New York,* Burr-Freeman-Herring Commission 1903, 3.
[8] *Report of the Commission on Additional Water Supply for the City of New York,* Burr-Freeman-Herring Commission 1903, 7.
[9] *Report of the Commission on Additional Water Supply for the City of New York,* Burr-Freeman-Herring Commission 1903, 4.

person per day, and found that the city needed to bring 500 to 575 million gallons of water per day from upstate by 1930, if not sooner.[10] The engineers provided estimated water need for the city in 1925 (figure 5.2).

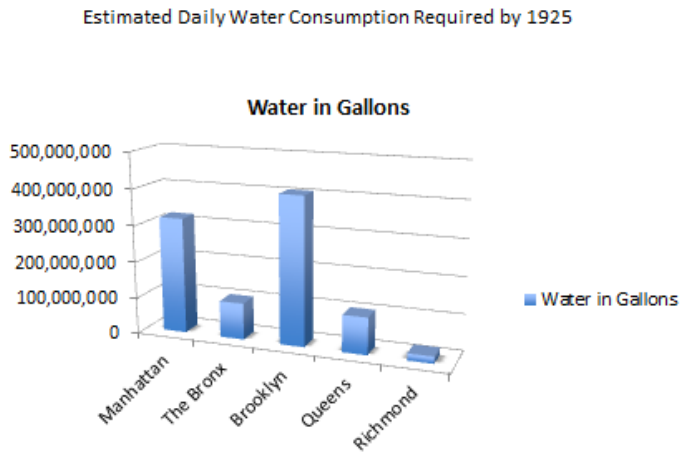


Figure 5.2: Estimated Daily Water Consumption Required by 1925, Burr-Freeman-Herring Commission, 1903.

In the Burr-Freeman-Herring Report, each of the six departments provided the findings of their exhaustive research. Among their recommendations were implementing universal metering of water in order to reduce water waste. Common metering practices were not universal at this time. Water used for industrial purposes was metered and the cost was uniform. However, water for residences was sold on a flat rate, called frontage charges. Homeowners could apply for a water meter, but since they preferred to pay for water with the flat rate, very few private homes had water meters.[11] Metering would remedy the main source of waste of water, which

[10] *Report of the Commission on Additional Water Supply for the City of New York*, Burr-Freeman-Herring Commission 1903, 14.
[11] Department of Environmental Protection Archive, Box RS1215 Folder 1, December 3, 1930 Letter from Chief Engineer William Brush to Italian Government Commission. Diane Galusha, *Liquid Assets: A History of New York City's Water System* (Fleischmanns: Purple Mountain Press, 2002), 92-93.

engineers had determined to be caused by leaky plumbing fixtures. The report also recommended house-to-house inspections for water use and waste since the majority of the waste of water was taking place in private dwellings. Despite these measures to curb waste of water, the engineers explained, the city would still require a large additional supply of water.[12] The report articulated the increased need for water by 1925 as based on population growth (figure 5.3).[13]

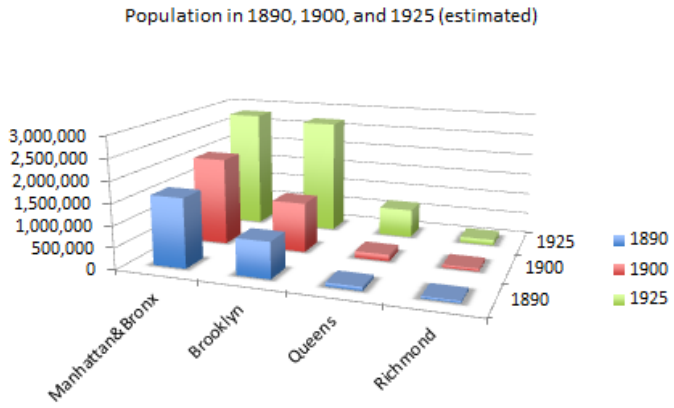


Figure 5.3: Population in 1890, 1900, and 1925, Burr-Freeman-Herring Commission, 1903.

In terms of new water sources, the report suggested taking water from the Hudson River above Poughkeepsie and filtering it.[14] The engineers also recommended harvesting water from new water sources upstate including the Fishkill, Wappinger, Catskills, Esopus, Rondout creeks,

[12] *Report of the Commission on Additional Water Supply for the City of New York*, Burr-Freeman-Herring Commission 1903, 11, 72.
[13] *Report of the Commission on Additional Water Supply for the City of New York*, Burr-Freeman-Herring Commission 1903, 67-68.
[14] *Report of the Commission on Additional Water Supply for the City of New York*, Burr-Freeman-Herring Commission 1903, 43.

with Fishkill and Esopus Creeks to be accessed immediately.[15] The report explained that the City of New York had eighty-four distinct sources of water supply, although some of these supplies provided just a small amount of water. Furthermore, many of the formerly independent communities now comprising Greater New York had managed their water supply systems, which had not been greatly affected by municipal consolidation. To remedy this situation, the report recommended the immediate development of ground water sources for Queens and Brooklyn and that these sources be supplemented by the public water supply from the new aqueduct, which would bring 500 million gallons of water to the city daily from points north.[16]

Regarding water quality, the report stated that the most reliable current index to sanitary conditions of the public water supply were the typhoid death rate statistics from 1868 to 1903. When engineers examined these data alongside statistics about rainfall and stream flow, they found typhoid fever to be most prevalent in dry years, when the reservoirs were taxed to the greatest extent. An increased storage capacity in the watersheds was correlated with a decrease in the death rate from typhoid in New York, which proved to be lower than those of most American cities. The report then outlined the increased sophistication of water testing, which now included a four-part process: a bacteriology examination, a microscopic examination, a physical examination, and a chemical analysis. With regard to filtration, the engineers explained that none of the water supplied to Manhattan, the Bronx, or Richmond was filtered and that Brooklyn was the only section of the city in which some filtration was used. Engineers engaged by the public water system collected and test water samples from the terminus of the Croton Aqueduct at the 135th Street Gatehouse and form the terminus of the Brooklyn Aqueduct at

[15] *Report of the Commission on Additional Water Supply for the City of New York,* Burr-Freeman-Herring Commission 1903, 15-20; 72.
[16] *Report of the Commission on Additional Water Supply for the City of New York,* Burr-Freeman-Herring Commission 1903, 34-35; 73.

Ridgewood Pumping Station on a daily basis.[17]

With the Burr-Freeman-Herring report, the city had completed its research and now it needed "a man and a plan." That man, as it turned out, would be George McClellan, a Tammany politician, who won the 1903 mayoral election against Low.[18] Charles Francis Murphy, Croker's successor, had selected McClellan as a respectable candidate able to win back control for Tammany Hall from Low's Reform Party. Once in power, McClellan sought to bring a new legitimacy to the Democratic party.[19] When McClellan took office in 1904, securing public water and providing sufficient water would form one of his foremost challenges. Stronger centralization of the water supply policy apparatus truly occurred under Mayor McClellan.

Securing Power and Money

McClellan and his supporters lobbied for the passage of a new bill, which would create a central Board of Water Supply (BWS) for the city.[20] The mayor introduced this bill, called the McClellan Act or the Mayor's bill, to the State Legislature on January 3, 1905. Initially, Governor Frank W. Higgins was not supportive of this bill, for he believed that water resources development should fall under the auspices of the state.[21] In a public hearing held on February 22, 1905, proponents explained that the bill would allow the City of New York to secure water

[17] *Report of the Commission on Additional Water Supply for the City of New York,* Burr-Freeman-Herring Commission 1903, 34-36.
[18] David C. Hammack, *Power and Society: Greater New York at the Turn of the Century* (New York: Russell Sage Foundation, 1982), 120.
[19] Oliver Allen, *The Tiger: The Rise and Fall of Tammany Hall* (Reading: Addison-Wesley, 1993), 214. Allen states that Murphy "… found his man in George B McClellan, Jr. the son of the Civil War general, a solid Tammany hand who had served briefly as president of the Board of Aldermen and had represented an East Side district in Congress for several terms."
[20] In 1901, the Manufacturers' Association of Brooklyn, led by Charles N. Chadwick, introduced a bill to the State Legislature which would establish a Board of Water Supply vested with mandatory power to acquire new water sources for the city. This bill failed in 1901 and again when resubmitted in 1902. Chadwick had written a report on water in Brooklyn in 1897 in which he lobbied for a business administrative model for water which would be free from politics. See *Documents of the Assembly of the State,* 141st Session, vol. XXIX, no.62, (Albany: J.B. Lyons Company, 1918), 757-758, 768.
[21] *Documents of the Assembly of the State of New York,* 759.

supply from several counties in upstate New York.[22] Hovering above the debate was the charge that the city's new Tammany administration wanted to build its own water works in the Catskills because of the great patronage value of such a vast expansion.[23] Others argued that the state and city should partner to deliver water not only to the City of New York, but also to all of the cities along the Hudson River. Under such a joint venture, there would be an equal distribution of patronage between the Republican State politicians and Tammany Hall, with the State organization receiving the patronage on the reservoirs and Tammany receiving patronage on the aqueduct. A second proposed bill, the Agnew bill, would create a state entity, the State Water Supply Commission (SWSC). The SWSC would make final decisions about the amount of water to be taken from certain counties upstate, while a city commission, the BWS, would handle the planning and management of the system.[24]

With the division of power between city and state somewhat sketched out in this pending legislation, the next matter was to agree on a water bill determining from where the city would draw water. The city negotiated with Westchester, Putnam, Suffolk, and Dutchess counties, making the necessary concessions to each so that the counties would allow the city to take the counties' water. Only Ulster County refused to let the city enter the county to remove water. In fact, residents of Ulster County supported a bill, which would forbid the city from condemning land and taking water from their county.[25] While the proposed bill in Ulster County denied the city access to water sources, it granted access to private water companies. City officials worried that, if a private company could acquire such water sources in Ulster County, it could then try to

[22] "Move to Beat Mayor's City Water Measure," *New York Times,* February 23, 1905, 6.
[23] "Move to Beat Mayor's City Water Measure," *New York Times,* February 23, 1905, 6.
[24] "Move to Beat Mayor's City Water Measure," *New York Times,* February 23, 1905, 6.
[25] "Move to Beat Mayor's City Water Measure," *New York Times,* February 23, 1905, 6.

sell this water to the City of New York at inflated prices.[26] Concerns about falling prey to unregulated private companies were more convincing in the wake of the recent Ramapo Company episode.

But Ulster county residents feared that the city would seize half its territory. Governor Higgins met with Engineer Burr to review the map and confirmed that the city planned to take only eighteen square miles in Ulster, which was a small percentage of the county.[27] Ulster residents wanted to be left alone. The standoff between Ulster County and the city came to a head at a public hearing held March 29. Representing Ulster County, Judge A.T. Clearwater explained that the residents of Ulster were "as much, if not more, afraid of the shadow of the Ramapo than of New York City."[28] He told those assembled at the hearing that Ulster would easily pass a bill that shut out both private water companies and the city. These "Ulster patriots" did not want their water taken. But if there was no way to prevent their water from being taken, then they demanded two amendments added to the Mayor's bill.[29] These amendments were two concessions made by the Corporation Counsel to Ulster that that the city would build only the Ashokan Dam and that it would pay for any indirect damages. Governor Higgins closed the meeting, saying that the bills were good and that the water question seemed to be resolved for the time being, with the amendments to be made to the bill. The city had made a separate peace with the Ulster Patriots, yet controversies over the Mayor's Bill were not over yet.

Defining municipal power related to water became a key issue. The city faced off against the state when the State Cities Committee tried to amend the Mayor's Bill by eliminating a provision that allowed the city to manufacture and sell power for electric lighting in connection

[26] "Water Bill Agreed On," *New York Tribune*, March 23, 1905, 3.
[27] "No Sympathy for Ulster," *New York Tribune*, March 25, 1905, 1.
[28] "Concession for Ulster," *New York Tribune*, March 29, 1905, 4.
[29] "Concession for Ulster," *New York Tribune*, March 29, 1905, 4.

with the extension of the water supply.[30] Mayor McClellan sought the right to derive, use, and sell electric power generated from the new dams for electric light for the city.[31] The state felt this was not an appropriate role for the city and that such electric supply should be managed by a private corporation. Mayor McClellan protested this change, stating "...these corporate interests are not seeking the public welfare…" and that such corporate interests interfered with "the natural rights of the public."[32]

Governor Higgins disagreed. He saw this venture as improper for a municipal function. "This extension of the principal of municipal ownership," he stated, "demands serious considerations on its own merits and not as a mere incident to a general plan."[33] Governor Higgins felt the provision allowing the city to manage lighting was "too radical an experiment in the field of municipal operation."[34] Corporation Counsel lawyers for the City of New York and Mayor McClellan evoked rhetoric about public good trumping private interests. But this rhetoric did not convince the committee. On April 26, 1905, the State Cities Committee voted to approve the Mayor's bill without the mayor's lighting plan.[35] The mayor pressed his cause, asking the governor to retain the provision, but he was ultimately unsuccessful in this effort.[36] While there was a willingness to view the provision of water as a public enterprise, defining the limits of municipal power in public water was an ongoing process. The state squashed the city's pitch to sell electric power generated by water on the grounds that this action would be outside the scope of public water, which in many ways, it was. In making this decision, the State ruled that selling

[30] "Water Bill Conflict: May Block all action," *New York Tribune*, April 20, 1905, 3.
[31] "Mayor to Wage War on Water Amendment," *New York Times*, April 21, 1905, 1.
[32] "Water Bill Conflict: May Block all action," *New York Tribune*, April 20, 1905, 3.
[33] "Water Bill Conflict: May Block all action," *New York Tribune*, April 20, 1905, 3
[34] "Mayor Going to Albany for Power Plan Fight," *New York Times*, April 24, 1905, 6.
[35] "Mayor's Lighting Plan Dead," *New York Times*, April 26, 1905, 6.
[36] "Mayor Appeals to Governor," *New York Tribune*, April 26, 1905, 1.

electric power, even that generated by public water, would be left to private companies, which would be regulated by the State.

On May 4, 1905, the Senate passed both the Agnew bill, establishing the State Water Supply Commission (SWSC), and the Mayor's bill, creating the new Board of Water Supply of the City of New York (BWS). Because the Mayor's bill had been amended, it went back to the Assembly. Some senators believed the Agnew bill to be "a vulgar grab for patronage."[37] Senator Brackett went on record as opposing the principal of the state overseeing the city.[38] "There is no need of a state commission to protect localities, and the Republicans of this body have no business to make New York's water supply on any such conditions. It's an old game – giving a privilege and exacting patronage in return."[39] Similarly, some advocates of state power, especially the governor, believed the city to be guilty of overstepping its bounds, as played out in the lighting provision disagreement. Yet, the bill moved ahead. On May 11, 1905, after lodging a bitter complaint about the removal of the lighting provision, Mayor McClellan accepted the Greater New York Water Supply Bill.[40]

With the support of the mayor and powerful civic organizations, the state legislature passed the Laws of 1905 on June 3, 1905. These laws granted broad powers to the city and to the state to manage and expand the water system. Chapter 723 of the Laws of 1905, which had been the Agnew bill, created the SWSC and defined its powers and duties. The governor was to appoint five citizens of the state to comprise the SWSC. The act stipulated that no other municipal corporation or entity of the state would have any power to acquire any land for

[37] "Both Water Bills Pass," *New York Tribune*, May 4, 1905, 2.
[38] "Water Supply Bills Passed," *New York Times*, May 4, 1905, 1.
[39] "Both Water Bills Pass," *New York Tribune*, May 4, 1905, 2.
[40] "Mayor Accepts Bill for Water Commission," *New York Times*, May 11, 1905, 7.

additional water supply for the city.[41] Oddly enough, the act omitted such a restriction applicable to private water companies. This omission would be corrected by an amendment to the act passed in 1906.

Chapter 724, known as both the McClellan Act and the Mayor's bill, sought "pure and wholesome water" for the City of New York. The act mandated that the mayor appoint a commission of three public officers to comprise the new BWS.[42] The BWS could enter any land to survey it. The act provided for "the acquisition of lands or interest therein, and for the construction of the necessary reservoirs, dams, aqueducts, filters and other appurtenances for that purpose."[43] The BWS would submit maps and plans for new waterworks to the Board of Estimate and Apportionment (BEA) and then to SWSC for approval.[44] On June 9, 1905, Mayor McClellan appointed the BWS by selecting the three commissioners from a list of nominations from the Chamber of Commerce, the Board of Fire Underwriters, and the Manufacturers' Association of New York, thereby keeping a previous promise to these groups to do so. Each BWS member would be paid a salary of $12,000 per year and would be prohibited from holding any other federal, state, or municipal office.[45]

With the creation of the BWS, the city finally had a strong water supply commission fully vested with the power of eminent domain. Although Mayor McClellan had lost the battle with the State over selling electricity, the city now possessed the authority it needed to build a new water system. While the rights of the private Ramapo Water Company and some key pieces of legislation had restricted the city previously, after 1905, the city's only restrictions were those

[41] *The Laws of 1905. From the Compilation of Legislation in Regard to Water Supply of the City of New York* (Albany, New York, 1912): 723.
[42] *The Laws of 1905*, 723-725.
[43] Charles H. Weidner, *Water for a City: A History of New York City's Problem from the Beginning to the Delaware River System* (New Brunswick: Rutgers University Press, 1974), 178.
[44] *The Laws of 1905*, 723-725.
[45] *The Laws of 1905*, 723-725.

maintained by the State. In some ways, a détente between city and state emerged. With the BWS and the SWSC, they city and the State each had sovereignty over part of the public apparatus to manage water and this would require their cooperation and collaboration moving forward.

Now that the necessary authority and bureaucratic structure were in place, financial backing became the next priority. A lack of adequate funding had made it difficult to propose new plans to provide ample and clean water for the city. To secure funding, major changes in municipal finance were needed. An amendment to the State constitution addressed this issue. *The New York Times* on November 4, 1905 urged voters to vote yes on the amendment, arguing that water debt should be exempted because "it is not paid from general taxes levied on the assessed values, but is met by the water rents," meaning fees paid by customers for water use.[46] In short, it was not necessary at this juncture to increase taxes to cover water, because a revenue source was in place, namely water fees. This meant that city officials had to collect these fees reliably and consistently across the city. On November 8, 1905, New Yorkers ratified the constitutional amendment, which exempted the city's water supply bonds from its debt limit. This amendment had wide implications. It meant that the city could now borrow the $200,000,000 necessary to build the Catskills waterworks.[47] That this amendment passed indicated a newfound trust in urban government and its ability to handle finances as well as a testament to the increased importance of water. Voters had begun to overcome the age-old fears about political patronage in order to have taken this essential step toward funding public water.

The exemption of water from the debt ceiling was critical as was the expansion of municipal bonds. While the city had issued some bonds to build the Old Croton Aqueduct in

[46] "Constitutional Amendments – Yes," *New York Times*, November 4, 1905, 8.
[47] Weidner, *Water for a City*, 176.

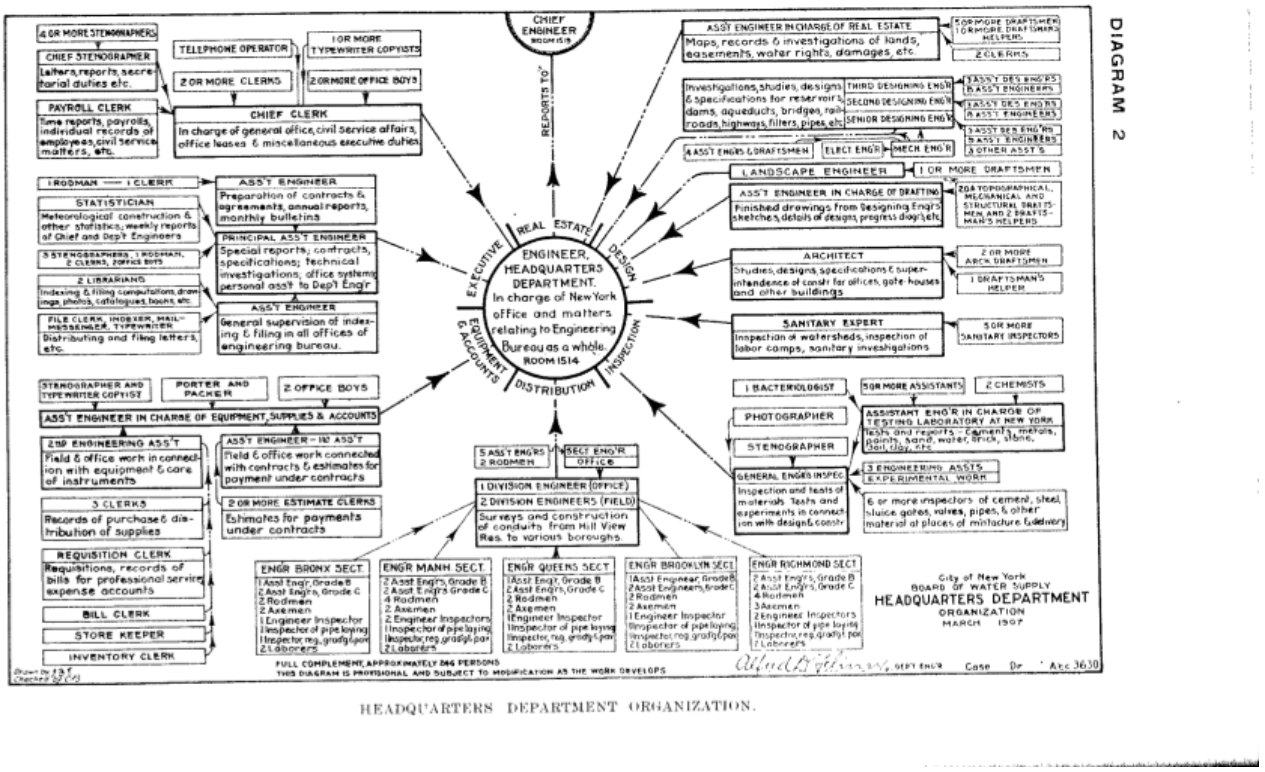
1837, this was not a common practice at that time. Municipal bonds became much more prevalent later in the nineteenth century. The Panic of 1873 led to municipal bond defaults. The exposure of political corruption prompted restrictions on municipal debt limits. Although the Panic of 1893 was devastating for businesses, municipal governments fared better. In the 1890s, municipal bonds became a safer and more attractive investment than the more volatile financial products on the market.[48] Between 1890 and 1920, the construction of water infrastructure had become so expensive that it could exceed the budgets of private companies, thereby requiring municipal finance and bonds.[49] Whereas in 1890, forty-three percent of waterworks across the country were publically owned, by the 1920s, this number had increased to seventy percent.[50] By 1905, across America, waterworks represented the largest line item in municipal debt.[51]

Building Bureaucracy and Planning for the Future

As previously mentioned, the Laws of 1905 created a new water bureaucracy with a new kind of complexity, including a closer partnership between city and state and a clearer subdivision of duties between city agencies. The city's BWS was to secure new water supplies whereas the city's Department of Water Supply, Gas, and Electric (DWSGE) would handle operations. The BWS was "a constructive board exclusively."[52] It would have "nothing to do with the administration of the finished system," as the DWSGE was to assume that function.[53]

[48] David Cutler and Grant Miller, "Water Water Everywhere: Municipal Finance and Water Supply in American Cities, in *Corruption and Reform: Lessons from American Economic History* (National Bureau of Economic Research, University of Chicago Press, 2006), 168.
[49] Cutler and Miller, "Water Water Everywhere," 168.
[50] Cutler and Miller, "Water Water Everywhere," 168.
[51] Cutler and Miller, "Water Water Everywhere," 172-173.
[52] *Documents of the Assembly of the State of New York*, 777.
[53] *Catskill Aqueduct Celebration Publications: A Collection of Pamphlets Published in Connection with the Celebration of the Completion of the Catskill Aqueduct, Being Chiefly Catalogues of Exhibitions Held by Art, Scientific and Historical Museums and Institutions in New York City in Cooperation with the Mayor's Catskill*

The five branches of the BWS were the Department of Reservoirs, the Northern Aqueduct Department, the Southern Aqueduct Department, the City Tunnel, and Headquarters.[54] An organizational chart of the Headquarters Department shows the overwhelming complexity of a single unit of the five within the BWS (Figure 5.4).



HEADQUARTERS DEPARTMENT ORGANIZATION.

Figure 5.4: *Second Annual Report of the Board of Water Supply, 1907, accompanied by a Report of the Chief Engineer, December 31, 1907, New York, New York.*

The Laws of 1905 were a major turning point in the story of how New York's water became public. First, these laws created a complex bureaucratic structure, which would enable

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Aqueduct Celebration Committee in 1917. Arranged by George Frederick Kunz, Chairman of the Committee on Art, Scientific and Historical Exhibition. New York: Mayor's Catskills Aqueduct Celebration Committee, 1917.

[54] *Documents of the Assembly of the State of New York, 777.*

the construction of the proposed Catskills water system.[55] Power became more centralized, with more sub-agencies involved, creating a vast and layered bureaucracy. This new administrative structure of the BWS, a city agency, empowered yet limited by the State, created a hybrid model between city and state, with more authority than any prior bureaucratic organization.[56] This hybrid model indicated an ongoing unwillingness of the city and the state to trust each other resulting in a rapprochement of sorts between city and state.

Second, these laws granted New York City the power of eminent domain in the new watersheds, expanding the authority under Daly's Raids and reclaiming the power previously given away to the Ramapo Water Company. The BWS, a city agency, now vested with the power of eminent domain, could begin collecting proposals for the new Catskills water system. The McClellan Act permitted the city to seize land ten days following the appointment of an appraisal commission and it mandated that the city pay the owner one half of the assessed value of the land.

With the new laws in place, the city began to formulate its plans for the expansion of the water system. On June 9, 1905, Mayor McClellan appointed the three members of the BWS and on August 1, 1905, the Board appointed their chief engineer.[57] Before the city could begin construction of the waterworks, the SWSC needed to review the city's plans to determine if they were "justified by public necessity, and (were) just and equitable to the other municipalities and civil divisions of the State affected thereby, and to the inhabitants thereof…"[58] At the end of

[55] Weidner, *Water for a City*,177.
[56] Bone, et al, eds.,*Waterworks.* 106-177.
[57] Weidner, *Water for a City*, 180.
[58] *Second Annual Report of the State Water Supply Commission of New York, for the year ending February 1, 1907* (Albany: J.B. Lyon Company, State Printers, 1907).

August 1905, the BWS had drilling crews at work in the Catskills in order to expedite the submission of plans for approval.[59]

With the five departments of the BWS in operation and with the Catskills selected as the new water source, the next step was to determine the route of the aqueduct, the location of the reservoirs, and the nature of the water works to be built, requiring an extensive survey process.[60] On October 9, 1905, the BWS submitted its plans for the Catskills system to the BEA. The BEA approved the plans at the end of that month. On November 3, 1905, Mayor McClellan presented the plans to the SWSC for approval.

These plans laid out the proposed route of the aqueduct and the location of the reservoirs of the new system. Unlike previous plans, this time there would be no picturesque bridges with dramatic arcades like those of the High Bridge. Rather, the main aqueduct of the new system would be underground for safety reasons.[61] The Catskills system would be comprised of the Ashokan, Kensico, Hill View, and Silver Lake reservoirs, one hundred and twenty-six miles of aqueduct, including eighteen miles of City Tunnel #1, and pipeline under the Narrows.[62] The system rivaled the Panama Canal in size and scope.[63]

The ways in which the system would transport the fresh water to New York involved compelling new technology. Once the whole system was completed, water would travel a total of 130 miles from the Catskills to City Hall. The new supply was to be gathered from the Esopus, Rondout, Schoharie, and Catskill Creeks and then directed to the Ashokan Reservoir in Ulster County. From there, a tunnel under the Hudson River would carry the water to the Mount Kisco Reservoir and then on to the water mains to the city, which it would supply with 800

[59] Weidner, *Water for a City*, 180.
[60] *Documents of the Assembly of the State of New York*, 777.
[61] Edward. H. Hall, *Water for New York City* (Saugerties: Hope Farm Press, 1993), 88-90.
[62] Weidner, *Water for a City*, 191.
[63] Weidner, *Water for a City*, 227.

million gallons of water a day.[64] The water sources of the Catskills Mountains offered an enormous potential quantity of water. Equally important as the quantity of Catskills water was its quality. This water was clean and had a low percentage of minerals, making it well suited for drinking. Furthermore, the elevation of the area would allow the water from the Catskills to be transported to the city almost exclusively by gravity. When gravity would have taken water in the direction away from New York, the BWS employed new technology to remedy this situation. The city built a dam across the Schoharie creek, which would reverse the direction of the flow of water, then sent the water south through a diversion tunnel running through the Shandaken Mountain Range. At last, the water was released into Esopus Creek above the Ashokan Reservoir.[65]

After receiving the plans from the Mayor, the SWSC arranged for public hearings to be held from November 1905 through February 1906. As a result of these hearings, the state mandated that the city offer greater protection to property owners whose land would be affected by the new Catskills water system.[66] In April of 1906, *The New York Tribune* reported that in preparation for the enormous undertaking of the new Catskills water system, "a large and competent engineering staff [must] be fully organized and ready to begin construction on the aqueduct and reservoir now being surveyed."[67] Eight hundred engineers engaged in a two-year planning process from 1905 to 1907 of making surveys and preparing plans before beginning construction.[68] The SWSC approved the plans of the BWS with these amendments on May 14, 1906,[69] marking a remarkable speediness of action in the approval process.

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[64] "98 Million Dollars for Improvements," *New York Times*, November 10, 1907.
[65] Bone, et al, eds.,*Waterworks*, 114.
[66] Weidner, *Water for a City*, 182-185.
[67] "Fowler Bill Signed," *New York Tribune*, April 26, 1906, 9.
[68] "98 Million Dollars for Improvements," *New York Times*, November 10, 1907.
[69] Diane Galusha. *Liquid Assets: A History of New York City's Water System* (Fleischmanns: Purple Mountain Press, 2002), 93-96.

If this ability to plan and to move quickly can be seen as a litmus test of the new policy apparatus, then it must be deemed successful, for city engineers engaged in exhaustive planning prior to groundbreaking for the new water system. Equally significant, the planning for the Catskills system was of a wholly new kind, due to advancement in engineering science. The Mayor directed this planning effort, with a new prominence and with certain authority, granted by the Laws of 1905. The BWS started its surveying process in advance of approval. By the end of 1906, 400 employees and 882 civil servants had begun work.[70] Armed with these new powers and improved technologies, Mayor McClellan planned to build the largest municipal water system in world.

On June 20, 1907, the city broke ground for the massive Catskills System, with Mayor McClellan turning the earth with a shovel at Peeksville.[71] "Let a New Yorker journey into the Catskills and up the valley of Esopus Creek to a narrow gorge at Olive Bridge, eighty-five miles from the city," reported *The New York Times*, "he would find municipal contractors clearing the ground and putting up workmen's houses as a preliminary to starting work on the city's new $162,000,000 water supply system. This will be in many ways the greatest undertaking of it kind ever attempted by man."[72] This article went on to make the ever frequent and familiar comparison to Ancient Rome as in the past, but this time, the new American system would surpass that of ancient Rome.

> When the ancient Romans spanned the Campania with graceful bridge-like aqueducts, bringing water from hills, 15 miles or so distant to the old world metropolis, they created a water system that was for centuries the wonder of men. It seems like a child's plaything beside the new water system of New York. The city is already four times the size of ancient Rome at the height of her glory. The Roman aqueducts supplied each person in the city with 300 gallons of water a day. New Yorkers now use 500 gallons per

[70] Galusha, *Liquid Assets*, 96.
[71] *Documents of the Assembly of the State of New York*, 771.
[72] "98 Million Dollars for Improvements," *New York Times*, November 10, 1907.

capita every 24 hours.[73]

Delivering this much water per day required new technologies. Three new developments in engineering science facilitated the Catskills project, namely, pressure tunnels, Portland cement, and data collection on subsurface geography.[74] The new Catskills Aqueduct utilized pressure tunnels or siphons, which were longer and wider than those of the past.[75] In November 1909, the BWS submitted its plans for City Tunnel #1 to the city's BEA, which approved the plans and requested permission from the SWSC to begin construction. The State granted permission on October 20, 1910 and four sets of contractors began the work. Built between 1911 and 1915, City Tunnel #1 was the longest pressure tunnel in the world.[76]

In terms of construction materials, rather than stone and brick used for the Croton Aqueducts, the Catskills system was built of concrete, "the material of modern engineering ."[77] Although concrete has been around since ancient Rome, the science of cement allowing engineers to predict its strength and efficiency was new in the 1900s. The significance of this development cannot be overstated. The fact that engineers could prove their expectations about materials was a tremendous development. Engineers could now calculate pressures, hydrology, statics, and strength of materials, as never before, with an unprecedented accuracy. These mathematical calculations determined the pressure of a structure during construction of the New Croton Dam. This technique was utilized and perfected during the Catskills project. Data collection on subsurface geography was a new development at this time. Drilling the tunnel under the Hudson River was a four-year process for engineers. Unlike previous underground

[73] "98 Million Dollars for Improvements," *New York Times*, November 10, 1907.
[74] Bone, et al, eds.,*Waterworks.* 106-177.
[75] See Bone, et al, eds., *Waterworks*, 173.
[76] Galusha, *Liquid Assets*, 113-120.
[77] Bone, et al, eds.,*Waterworks*, 129.

projects, though, in this case, due to advances in drilling technology, engineers were able to drill and collect data with much greater success than on previous projects.[78]

In addition, engineers perfected techniques that were not new but that were employed in a new way on the Catskills project. These techniques included hard rock tunneling, steam locomotion, and steel cable rigging. Engineers conducted hard rock tunneling in a new fashion and on a much larger scale. In the case of the Catskills, engineers truly defied the topography by tunneling under the Hudson River, in a feat of engineering prowess heretofore unseen. The use of steam locomotive railway for transportation of materials was not new, but it greatly facilitated the Catskills project on a larger scale than it had in the past, as railroad tracks were laid alongside the entire path of construction. Steel cable rigging, used by John Roebling during construction of the Brooklyn Bridge, also had a major impact on the Catskills system, in that it allowed engineers and workers to move tons of materials overhead instead of over ground.[79] Such significant improvements greatly facilitated the construction of the Catskills system.
With the support of the authority and bureaucratic organization established in 1905, engineers were able to leverage the Progressive Era ethos of trust in expertise to usher in a greater trust in engineering science.

Eliminating the Private Water Companies of the Boroughs

Alongside this story of the planning and execution of the Catskills water system runs another narrative, which is key to understanding the fourth distinctive feature of the period 1901 to 1917. After 1905, with the BWS and the SWSC combining to create powerful bureaucratic

[78] Bone, et al, eds.,*Waterworks.* 106-177.
[79] Bone, et al, eds.,*Waterworks.* 106-177.

apparatus, the complete removal of any private entity from the management of water in the City of New York emerged as the next step toward securing public water.

Private water companies continued to operate in Greater New York in both distribution and supply. These private water companies, operating in Queens, Brooklyn, Westchester, and Staten Island, included the Jamaica Water Supply Company, the Queens County Water Company, the Upper New-York City Water Company, the New-York and Westchester Water Company, the Woodhaven Water Supply Company, the Flatbush Water-Works Company, the Blythebourne Company, the German American Improvement Company of Brooklyn, the Citizens' Water Supply Company, the Crystal Water Company of Edgewater, and the Staten Island Water Supply Company. Each company had binding contracts executed with town or city officials prior to consolidation. These companies also collected funds from the city since they supplied water to the city to be used for extinguishing fires. After the consolidation of Greater New York, the new City of New York had no involvement in or control over these contracts.[80]

In 1899, during the Ramapo incident, reformers demanded that water commissioners plan and implement the city's takeover of all the private water companies in the boroughs. Tammany officials refused, arguing that the city did not possess the necessary funds to extend its service to those parts of the city which were already being serviced by the private companies.[81] The existence of these small private water companies had served to bolster the argument in favor of the Ramapo contract. If the city was buying water from private companies already, what was to prevent it from purchasing more water from another company?[82] When state legislation removed the rights of the Ramapo Company to condemn watersheds upstate and when the city

[80] "Tammany Disregarded It," *New York Tribune,* September 27, 1901, 6.
[81] "Tammany Disregarded It," *New York Tribune,* September 27, 1901, 6.
[82] Dutcher's letter to Coler of August 25, 1899 made this argument. He dismissed the objection to water provision by a private company, stating that the city had some twenty-one contracts currently with private companies for water.

secured the right of eminent domain allowing it to claim additional watersheds in the state, the prospects of private company involvement in water supply narrowed dramatically. The public perceived water management as a vehicle for potential graft, both in the public and private realms, but with more danger on the private side, which raised concerns about the remaining private water companies.[83] But naysayers had a valid point. How could water be truly and permanently public if there were still private water companies in operation? After 1905, the city needed to confront the elaborate system of private water company involvement in the boroughs.

The takeover of private water companies involved considerable effort. Investors were still committed to these small private companies, as evidenced by the stock certificates issued by the companies.[84] In a general scenario, once a city took over a private water company, then city officials needed to operate it, which required a permanent water board. This board would hire engineers, set the water rates, collect those fees, conduct surveys, and once approvals were granted, solicit bids for municipal contracts to do the work.[85] New York could not have even contemplated the take-over of private water companies without the bureaucratic structure of the BWS and the DWSGE in place.

Between 1901 and 1917, New York City officials pursued the gradual elimination of the parallel system of private and public water by taking over small private companies in the boroughs and integrating their infrastructure into the city's system.[86] Water Commissioner William Williams told *The New York Times* on June 16, 1916, that these private companies served 400,000 people and that he was investigating the "methods, rates, and earnings of the

[83] "Tammany Disregarded It," *New York Tribune,* September 27, 1901, 6.
[84] Galusha, *Liquid Assets,* 46-47.
[85] Cutler and Miller, "*Water,Water, Everywhere*," 159. City governments were often able to undermine the value of private water works, which allowed the city to acquire private waterworks at reduced cost. See Troesken, Werner and Gebbes, Rick. *Municipalizing American Water works, 1897-1915* (2001).
[86] Galusha, *Liquid Assets,* 46-47.

private water companies in Brooklyn, Queens, and Richmond."[87] As the city investigated the private water companies of the boroughs, it found evidence of financial foul play. In the case of the Queens Water Company, the Company had been undercharging the city for water for fire protection and then overcharging their domestic customers for water to make up the difference.[88] Although private water companies in the boroughs delivered a very small percentage of the overall water supply, their very existence and their persistence over the years undermined public water and divided the city into myriad localities of difference rather than creating a unified whole. Given the scope of this undertaking across the boroughs, this chapter focuses on Brooklyn.[89]

The Case of Brooklyn

Prior to consolidation, the City of Brooklyn relied on underground wells and several private companies for water. Supply was often inadequate and citizens complained frequently. After consolidation, in February of 1901, Brooklynites demanded more water. Residents of a neighborhood near Fort Hamilton claimed to be without any water supply. BWS officials were not encouraging about whether the situation would be improved in short order.

Engineer Birdsall visited Brooklyn to gain a better understanding of the conditions. Reporters on site asked him if the city would sign a contract with the private Blythebourne Water Company to secure a temporary water supply for Dyker Heights. Birdsall replied that there was no company that could supply the needed amount and that the Flatbush Water Company was

[87] "City's Water Supply: Big Savings Effected by Catskills Water Supply," *The New York Times*, June 16, 1916.
[88] *New York City's Administrative Progress, 1914-1916: A Survey of the Various Departments under the Direction of the Mayor, Conducted under the Direction of Henry Bruere, Chamberlain, City of New York, May 1916,* (New York: M.B. Brown Printing & Binding Company, 1916), 248.
[89] For overview of all private water companies in the United States, see M.N. Baker, editor. *Manual of American Water-works, 1897* (New York: Engineering News Publishing Company, 1897). The entry for New York alone is 62 pages long.

operating at its full capacity. "If some private individual got the contract and started driving wells on private property," Birdsall explained, "he would have all kinds of suits on his hands as a result of the recent decision of the Supreme Court giving a man damages for water taken from under his land."[90]

The city's short-term solution for Brooklyn's water shortage was for Commissioner Dalton to issue an order that water be supplied at once to Dyker Heights. The city charter granted the Commissioner the right to spend up to $1000 without requiring him to solicit bids for contracts. Dalton mandated that the Blythebourne Water Company supply the city with water "at the rate of $40 a million gallons until the limit of $1000 is reached."[91] This was a short-term solution to a much larger problem and any relief it provided would not last long.

In addition to Blythebourne, other private water companies operating in Brooklyn at this time included the Coney Island Water-Works Company, Flatbush Water-Works Company, German-American Improvements Company of Brooklyn, Kings County Water Supply Company, Long Island Water Supply Company, Nassau Water Company, New Utrecht Water-Works Company, and West Brooklyn Water Company.[92] Plans for the city to acquire the private water companies, either by purchase or condemnation, dated back to an 1899 resolution championed by then Borough President of Brooklyn, Edward M. Grout during the Ramapo scandal. Although the Board of Public Improvements had approved Grout's resolution that the city take-over the private water companies, this resolution was not obeyed at this time.[93] When Grout ran for City Comptroller in 1901, his involvement in the anti-Ramapo campaign became a

[90] "Cry for Water in Two Boroughs: Great Hardship Suffered by Thousands of Residents," *New York Times*, February 8, 1901, 16.
[91] "Cry for Water in Two Boroughs: Great Hardship Suffered by Thousands of Residents," *New York Times*, February 8, 1901, 16.
[92] See Baker, M.N., editor. *Manual of American Water-works* (New York: Engineering News Publishing Company, 1897).
[93] "Tammany Disregarded It," *New York Tribune,* September 27, 1901, 6.

rallying point for his supporters as did his call for municipal management of water.[94] The city's effort to takeover private water companies was renewed after 1905. There is a large body of evidence that the city planned to takeover each of these companies, with or without their consent.[95]

The Flatbush Water-Works Company (FWWC) had a contract with the city in which it would supply water to a section of Brooklyn for payment $30,000 per year from the city. This particular contract forbade the company from charging more for water in private dwellings than it charged the city for other uses. The city's Bureau of Estimate and Apportionment had authorized the city to begin condemnation proceedings of the company's infrastructure in order to acquire it. In September 1901, the Municipal Assembly had not yet passed the resolution to allow this to happen.[96] After 1905, with the new water bureaucracy in place, plans for the takeover began in earnest, but it would prove to be a lengthy process, spanning many years.

City officials began to research the activities of Brooklyn's private water companies. An inter-office DWSG&E memorandum dated November 6, 1914, provided an analysis of the practices of the FWWC when supplying water within the 29th ward of Brooklyn. The review found that there were three categories of water supplied: water for public uses included in the company's contract; water for public uses which the DWSG&E maintained should be included in the company's contract, but for which the company issued separate bills; water for public uses

[94] "Grout's Ramapo Record Is Set Forth In Detail," *Brooklyn Eagle,* September 24, 1901, 16. Grout had made his position on municipal ownership of water clear. On December 18, 1896, he gave a talk called "Municipal Ownership of Public Franchises" to the Executive Committee of the Young Democracy in which he stated that such franchises were natural monopolies, which meant that "the people ought to control them for their own welfare." See "Under Municipal Ownership," *New York Times*, December 18, 1896.
[95] Letter to Mayor Mitchel from William Williams, Commissioner, DWSG&E, June 11, 1915. Mayors Collection: 1849-present, New York City Municipal Archives.
[96] "Tammany Disregarded It," *New York Tribune,* September 27, 1901, 6.

which was not in the contract, but was supplied by the FWWC and charged separately.[97] The first section of the report addressed fire hydrants, public buildings, sewer, and street sprinkling; the second examined Kings County Hospital and the Parks Department; and the third, drinking fountains and the Parks Department.[98] Investigations like this one indicated the wide range of billing practices administered by private water companies and emphasized the need for standardization in this arena.

William Williams, Commissioner of the DWSG&E, was at the helm of the effort to acquire the remaining private water companies across the city. In a letter to Mayor John P. Mitchel, dated June 11, 1915, Williams provided a report on the state of the private water companies in operation. Williams explained that the FWWC was prepared to grant access to the DWSG&E to its financial records and that there were not any complaints from Flatbush customers at the present time.[99] Letters from between 1916 and 1920 outline the process of the city taking over the FWWC, stating that the city would have to make an agreement with the company.[100] An inter-office memorandum from the Brooklyn Borough Engineer to the Deputy Chief Engineer dated May 11, 1917 details the then state of the water mains in 40th Street and 12th Avenue in Brooklyn. These mains formerly belonged to the FWWC, but the city took over these mains once in April 1917. This memorandum closes by stating that on 40th Street between 12th and 13th Avenues, the premises numbers 1201 to 1217, "although in Flatbush territory are supplied by the City," whereas premises 1216 to 1232 "will continue to be supplied by the

[97] Memorandum from DWSG&E, November 6, 1914, Box RS1215 Folder 4, FWWC, Department of Environmental Protection Archive.
[98] Memorandum from DWSG&E, November 6, 1914, Box RS1215 Folder 4, FWWC, Department of Environmental Protection Archive.
[99] Letter to Mayor Mitchel from William Williams, Commissioner, DWSG&E, June 11, 1915. Mayors Collection: 1849-present, New York City Municipal Archives.
[100] Memorandum from DWSG&E, November 6, 1914, Box RS1215 Folder 4, FWWC, Department of Environmental Protection Archive. Letter, December 6, 1916, Box RS1221 Folder 2, Department of Environmental Protection Archive.

Flatbush Water-Works Company."[101] This letter demonstrates that a parallel system of public and private water supply existed at this time, as it specified which territories were to be supplied by FWWC and which by city.[102]

In fact, territory was a significant issue. A letter dated May 7, 1918, shows that, once securing the consent of the FWWC, the city laid pipes underneath Montgomery Street, between the 24th Ward and the 29th Ward. Since 1881, the FWWC possessed an exclusive franchise in the 29th Ward, which meant that the city was forbidden from providing water to private customers in that ward without permission of the FWWC.[103] These parallel systems continued to coexist until the city ultimately acquired each company one by one and that occurred unevenly, at different times in different locations. The city completed its takeover of the FWWC after 1920.

As the city worked to eliminate private water companies, some politicians sought to insert a new state regulatory body to oversee these private water companies. In 1916, the Greiner-Roemhild bill threatened to undo the city's autonomy with the state and its control over private water companies. If passed, this bill would transfer the oversight of private water companies from the city to a new public service commission, the Second District and First District, run by the State. In its "Memorandum in Opposition to Certain Laws Before the Legislature to Regulate Private Water Companies Within the State of New York," of April 10, 1916, the DWSGE Commissioner Williams argued against this bill.[104] Local control, he argued, was required in order to coordinate the distribution systems of private companies with those of the city. Several attempts were made to transfer the responsibility for the regulation and

[101] Interoffice Memorandum, DWSG&E, May 11, 1917, Box RS1221 Folder 2, Department of Environmental Protection Archive.
[102] Interoffice Memorandum, DWSG&E, May 11, 1917, Box RS1221 Folder 2, Department of Environmental Protection Archive.
[103] Letter, May 7, 1918, Box RS1221 Folder 2, Department of Environmental Protection Archive.
[104] Memorandum in Opposition to Certain Laws before the Legislature to Regulate Private Water Companies within the State of New York, April 10, 1916, Box RS1215 Folder 40, Department of Environmental Protection Archive.

acquisition of private water companies from the city to the state-run Public Service Commission, but this did not ever take place. The strongest argument for local control of these companies was that, more so than regulation, the DWSGE was engaged in constant appraisal of these private water companies in order to fold them into the city's public water system.[105]

Commissioner William Williams posited that the extension of the municipal water system to all boroughs of the city was "not only desirable but inevitable in the near future, and this is a further reason why the jurisdiction now exercised by the local authorities in regard to the layout of the private water companies' mains, the standards of construction and extensions to be made from time to time, shall continue in this department."[106] Any transfer of control of water rates to a state commission would mean the waste of the work in valuation of the private water companies, already executed by the city. Williams argued that control of rates must remain where it was. "To deprive this department at this time of its jurisdiction over these companies would be to throw away in large part the work that has already been done," Williams argued, "to postpone their effective regulation and greatly to increase the expense of finally completing such regulation."[107]

The value of expert knowledge comprised another argument against the bill to transfer oversight of private water companies from the city to the State. The city possessed this knowledge about water supply, but a new state commission would not. "The Public Service Commission for the First District, which under the Greiner-Roemhild bill would be given jurisdiction over precisely the same companies now subject to regulation by the city, now has no

[105] *New York City's Administrative Progress, 1914-1916: A Survey of the Various Departments under the Direction of the Mayor, Conducted under the Direction of Henry Bruere, Chamberlain, City of New York, May 1916,* (New York: M.B. Brown Printing & Binding Company), 1916, 248.
[106] Memorandum in Opposition to Certain Laws before the Legislature to Regulate Private Water Companies within the State of New York, April 10, 1916, Box RS1215 Folder 40, Department of Environmental Protection Archive.
[107] Memorandum in Opposition to Certain Laws before the Legislature to Regulate Private Water Companies within the State of New York, April 10, 1916, Box RS1215 Folder 40, Department of Environmental Protection Archive.

special knowledge in regard to water supply matters. It has not water engineers on its staff and no one particularly familiar with water rates and practices."[108] Expertise, part and parcel of the Progressive Era, became part of the rationale allowing the city to retain control of water. Knowledge about water quality was part of this trend. Williams addressed the American Water Works Association at the Hotel Astor on June 7, 1916, urging attendees to drink the city's water. "Infinite pains are taken to keep it pure and wholesome, and it is both. There are a great many good things to drink in New York besides Croton water, but there is no reason you should spend your money on bottled waters. You have come to New York at a supremely interesting time, because to the existing water supplies there is about to be added that [supply] brought at a very great expense from the Catskills."[109] In the end, this bill about the regulation of private companies did not pass and the city continued its work of the gradual acquisition of the private water companies.

Public Celebration of Public Water – October 1917

In 1917, as workers and engineers sounded the last explosion for the Catskills system, the city planned for a celebration of the new waterworks. The Mayor appointed a general committee of 500 citizens to plan the celebration in to mark the near completion of the Catskills Aqueduct, which would bring water to each of the five boroughs of the city.[110] This committee would plan a pageant, similar in nature to some water celebrations of the past, especially those of 1842. The goal of the celebration was to cause "the people of New York to realize more fully than

[108] Memorandum in Opposition to Certain Laws before the Legislature to Regulate Private Water Companies within the State of New York, April 10, 1916, Box RS1215 Folder 40, Department of Environmental Protection Archive.
[109] "New York's Water Example of Purity," *New York Times*, June 7, 1916, 21.
[110] "An Exhibition Illustrating the History of the Water Supply of the City of New York from 1639-1917" (New York: New York Public Library, 1917), 3. NYPL, Map Division.

heretofore the value of their wonderful water supply." [111] As with the Croton parade of 1842, this 1917 celebration would include a dramatic water fountain. On October 12, 1917, the three-day city festival began with the inauguration of a spectacular decorative water fountain in the reservoir in Central Park.[112] This jet fountain (figure 5.5) was to be 85 feet high so as "to throw a stream of water more than 100 feet that can be seen for five miles." *The New York Times* reported: "the appearance of the water will be visible from any point on the path around the reservoir."[113]

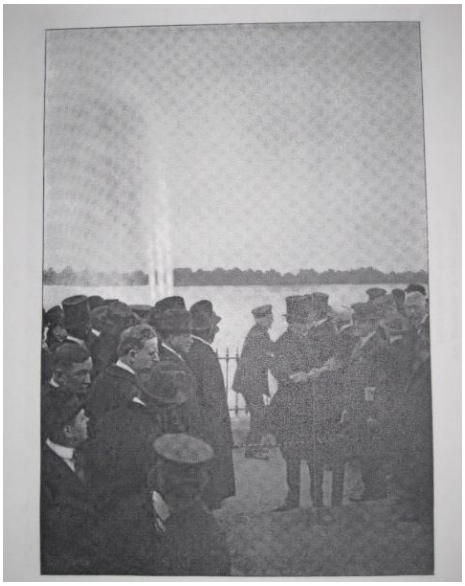


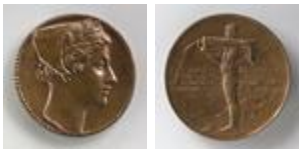
Figure 5.5: *Celebration of the Catskills Aqueduct, Documents of the Assembly of the State of New York.* 141st Session, vol. XXIX, no. 62. Albany: J.B. Lyon Company, 1918.

At the dedication of this fountain, Mayor John P. Mitchel addressed the crowd, saying, "I am glad to accept this fountain, which will perpetually serve, as a reminder of this remarkable

[111] *Catskill Aqueduct Celebration Publications: A Collection of Pamphlets Published in Connection with the Celebration of the Completion of the Catskill Aqueduct, Being Chiefly Catalogues of Exhibitions Held by Art, Scientific and Historical Museums and Institutions in New York City in Cooperation with the Mayor's Catskill Aqueduct Celebration Committee in 1917. Arranged by George Frederick Kunz, Chairman of the Committee on Art, Scientific and Historical Exhibition.* New York: Mayor's Catskills Aqueduct Celebration Committee, 1917.
[112] Julia Solis, *New York Underground: Anatomy of a City* (New York: Routledge, 2005), 23. The Old Croton Aqueduct was closed in 1955. The New Croton Aqueduct is still in use today.
[113] "Water Pageant Today," *New York Times*, October 12, 1917,10

public work, which was conceived and executed with an honesty and capacity seldom equaled in any public service."[114] Mayor Mitchell credited former Mayor McClellan, who had planned the Catskills system ten years earlier. Mitchell commented that the project was "executed in complete honesty,"[115] implying that graft and corruption were things of the past.

Commemorative ribbons and coins to mark the occasion provided tangible souvenirs of the event. To mark the completion of the Catskills Aqueduct, the city commissioned Daniel Chester French to design a commemorative medal. Such medals designed by American sculptors using the Beaux Arts style had enjoyed a new popularity in the 1890s due to the City Beautiful movement. The Mayor's Catskills Aqueduct Celebration Committee commissioned French for this project.[116] These commemorative coins featured a young woman wearing a laurel crown. She was the allegorical representation of the City of Greater New York (figure 5.6). On the other side, the medal pictured a male youth who pours water with the Catskills mountains in the background (figure 5.7).[117] The commemorative ribbon for the 1917 event



Figures 5.6 and 5.7: "Daniel Chester French and Augustus Lukeman: Catskill Aqueduct Medal, In *Heilbrunn Timeline of Art History*. New York: The Metropolitan Museum of Art, accessed April 3, 2011, http://www.metmuseum.org/toah/works-of-art/17.155.1

(figure 5.8) depicted a similar theme of water being delivered to the city. Overall, the 1917

[114] "Catskill Aqueduct Opened: Rain God Provides Setting," *New York Tribune*, October 13, 1917, 14.
[115] "Catskills Aqueduct Formally Accepted," *New York Times*, October 13, 1917, 12.
[116] Daniel Chester French and Augustus Lukeman: Catskill Aqueduct Medal, In *Heilbrunn Timeline of Art History*. New York: The Metropolitan Museum of Art, accessed April 3, 2011, http://www.metmuseum.org/toah/works-of-art/17.155.1
[117] Daniel Chester French and Augustus Lukeman: Catskill Aqueduct Medal, In *Heilbrunn Timeline of Art History*. New York: The Metropolitan Museum of Art, accessed April 3, 2011, http://www.metmuseum.org/toah/works-of-art/17.155.1

Figure 5.8: *Documents of the Assembly of the State of New York.* 141st Session, vol. XXIX, no. 62. Albany: J.B. Lyon Company, 1918.

celebration echoed back to the 1842 celebrations with an almost intentional reminder of the first glory of public water now revisited years later.

But unlike the Croton celebrations of 1842, there was a strong educational component to the Catskills Celebration to include "demonstrations of the value of the water supply."[118] A public exhibition on the history of water was a prominent component of the celebration. This exhibition provided a timeline of the "gradual development of one of the most important of the public utilities of the City of New York."[119] A publication by the New York Public Library explained that the exhibition would be of further value because it "enables us to understand, in some measure, how the problem of supplying great cities with adequate supplies of wholesome water is being solved by modern engineering methods."[120] Various exhibits illustrated how New Yorkers obtained water in past decades by picturing "quaint views" of water carts in Bowling

[118] "New York Begins Catskills Aqueduct Celebration To-Day," *New York Tribune,* October 12, 1917, 9.
[119] "An Exhibition Illustrating the History of the Water Supply of the City of New York from 1639-1917" (New York: New York Public Library, 1917).
[120] "An Exhibition Illustrating the History of the Water Supply of the City of New York from 1639-1917" (New York: New York Public Library, 1917).

Green, "the famous Collect Pond…with the celebrated Tea Water Pump…"[121] An allegorical pageant of the five boroughs, each one represented by a young women, depicted the "the modern city of New York."[122]

The instructional exhibit educated viewers about the history of water in New York, thereby contributing to the creation of a new public history about water in New York. The pageant celebrated the new, modern infrastructure bringing new sources of water to the united city. Viewed together, these two public events served as a justification for continued public management of water. The mayor's office published a collection of pamphlets to mark the occasion, which detailed New York's water history. In conjunction with the celebration, another exhibition about New York's water held at The New York Public Library that same month reflected a poignant moment in New York's water history. The library also published a pamphlet to accompany the public exhibition commemorating this moment.[123] In 1917, we see the celebration and the documentation of public water with an increased effort at public outreach about the history of water in New York.

Conclusion

The years 1898 to 1917 are within what historians have defined as the Progressive Era. Reformers and engineers viewed the efficiency of water and sewer systems as indicative of the degree of civilization that a society achieved. Many progressives sought to utilize new technologies to address social needs. During the early 20th century, engineers and architects applied progressivism's language of efficiency and of improvement of individual and collective

[121] "Plans for Water Pageant," *New York Times*, October 7, 1917.
[122] "Plans for Water Pageant," *New York Times,* October 7, 1917.
[123] *Catskills Aqueduct Celebration Publications,* The Mayor's Catskills Aqueduct Celebration Committee, 1917.

lives to city planning.[124] Publicly managed water was the centerpiece of this effort. Because water supply and sewers systems required permanent construction, long-range planning was a necessity.[125] Administration during the Progressive Era of the early 20th century encompassed "a centralized, permanent bureaucracy staffed by skilled experts, and a commitment to long-range, comprehensive planning."[126]

Municipal engineers were at the center of this new administrative approach. Engineers were planners and managers and they seemed to embody the traits of the ideal administrator for progressives, namely "efficiency, expertise, and an allegedly disinterested, incorruptible professionalism."[127] Municipal engineering, which emerged as a new profession in the 1890s, influenced the creation of the new professions of city planners and city managers in the early twentieth century.[128] As city officials deferred to engineers, patterns of urban government shifted.[129] The prominent and unfettered role of the engineers selected by the Board of Aqueduct Commissioners in the building of the New Croton Aqueduct illustrates this phenomenon.

Across the nation, the number of public water systems grew. In 1880, there were 293 publicly owned water companies, whereas in 1932 there were 7,832.[130] Yet, the public management of water was an aberration in utilities management. Other utilities, such as electricity, telephones, gas, and street cars, remained privately owned, although with public

[124] Stanley K. Schultz and Clay McShane, "To Engineer the Metropolis: Sewers, Sanitation, and City Planning in Late-Nineteenth-Century America," *Journal of American History*, 1978, 65 (2): 389-411.
[125] Schultz and McShane, "To Engineer the Metropolis," 397.
[126] Schultz and McShane, "To Engineer the Metropolis," 390.
[127] Schultz and McShane, "To Engineer the Metropolis," 402.
[128] Schultz and McShane, "To Engineer the Metropolis," 408.
[129] For more information on the evolution of city planning, see Harry Aubrey Toulmin Jr., *The City Manager: A New Profession*, (New York, 1915) and John L. Hancock, "Planners in the Changing American City, 1900-1940," *Journal of the American Institute of Planners*, XXXIII September 1967 290-304
[130] Troesken, Werner and Gebbes, Rick. *Municipalizing American Water works, 1897-1915* (2001), 3. At the start of the twentieth century, one third of public water operations had previously been privately owned water companies.

regulation.[131] Curiously, alongside the clear trend toward public management of water in the nineteenth century United States, the number of American private water companies increased from 1,489 to 2,950 between 1896 and 1924.[132]

Large-scale water works were most often public and the change from private to public was frequently connected to size of project and amount it would cost.[133] This was the case with the Catskills system of New York, but private companies persisted alongside this development. The Jamaica Water Supply Company (JWSC) of Queens remained in operation for the longest period of time. Under this company's contract with the city, renewed December 30, 1897, the city paid the company $20 a year for each fire hydrant it maintained. Residents of Jamaica who received water from the company for domestic use dealt directly with the company, paying the rates it stipulated.[134] Under this kind of contract, in which the city paid the company for fire protection and the residents paid it for domestic water. There was nothing to prevent the company from charging residents exorbitant rates for water. In 1915, when the city expressed interest in taking over the JWSC, it had not yet initiated the valuation process required before negotiations could begin. The DWSG&E conducted these valuations of private companies themselves, as opposed to having another agency do so.[135] The history of the city and its interaction with the JWSC continued well after the scope of this study, which ends in 1917, for the JWSC remained in operation until 1996.[136] Although the post-1905 bureaucracy to manage

[131] Scott E. Masten, "Public Utility Ownership in 19th Century America: The "Aberrant" Case of Water" *American Law & Economics Association*, Berkeley Electronic Press (2009). This study evaluates data from 373 waterworks serving 346 American cities in 1890.
[132] Masten, "Public Utility Ownership in 19th Century America:" 41.
[133] Masten, "Public Utility Ownership in 19th Century America," 29.
[134] "Tammany Disregarded It," *New York Tribune,* September 27, 1901, 6.
[135] Letter to Mayor Mitchel from William Williams, Commissioner, DWSG&E, June 11, 1915, Mayors Collection New York City Municipal Archives.
[136] The Charter of Greater New York allowed for extensions to be made to private companies systems within the city area and it was upheld in Court of Appeals in March 18, 1919. (Letter June 28, 1920, RS 1224 folder 1, Department of Environmental Protection Archive). Throughout the 1920s, the city received letters from customers about

water was more structured and had a clearer division of labor than in the past, it was also more complicated in order to handle an increasing large-scale water system.

With the scope of water needs constantly expanding and with the prior complete lack of planning for projected future growth, a larger and more powerful policy apparatus was needed to handle the expansion of the water system. After much delay, the government stepped in to take on this role by beginning to implement large-scale debt-financed public works projects and to takeover private water companies. Water became public. Although water was not then free of charge, as it was free from public wells in eighteenth century,[137] prices were regulated and access to clean drinking water came to be seen as a citizen's right. However, these assumptions were not always in place.

As this chapter argues, water was not securely public until funding, legal authority, and a massive bureaucracy were in place. The acquisition of the remaining private water companies was part of this effort. The city's planning process and the construction of the Catskills water system illustrate the expanding ambition of both the city and the state government in water after 1901. This massive expansion of public water needed the Progressive Era and its emphasis on expertise and scientific management in order to take place.

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insufficient water supply in Queens and its response was to mandate that the JWSC address these issues at its own expense. In 1938, there were protests against the JWSC (RS 1224 folder 1, Department of Environmental Protection Archive). It was not until 1996 that the city purchased the Queens portion of the Jamaica Water Supply Company. It was at that time the last remaining private water company in New York City. (Galusha, *Liquid Assets,* 46-47.)

[137] Peter Linebaugh and Marcus Rediker, *The Many Headed Hydra: The Hidden History of the Revolutionary Atlantic* (New York: Verso, 2002).

CONCLUSION

Water came to be codified as an essential public utility over the course of the late nineteenth and early twentieth century in New York, as this study's investigation of public health, urban reform, and government expansion has shown. By 1917, New York City, in conjunction with New York State, had taken full responsibility for providing the city with an ample and clean supply of drinking water and for overseeing any remaining private water companies. As we have seen, in the early history of New York, public and private management of water existed side by side. At the end of the eighteenth century, however, city officials granted control of the water supply to the private Manhattan Company. The government did not take on the provision of water as its direct work until the growth of the city demanded the transport of new sources of water to the city and until two prior attempts to outsource this issue to private companies had failed. The cholera outbreak of 1832, the failure of the private Manhattan Company to deliver water, and the concern about fire damage each motivated action toward a public water system. In the 1830s, the city started to acquire land to build the Croton Aqueduct, the first public waterworks, which began transporting water from the Croton watershed in 1842. But this was not the end of the story of how water became public.

Some scholars argue that New York's water became public in the 1830s and 1840s. While the 1835 public vote in favor of Croton was a turning point, moving away from the private Manhattan Company and towards the public management, there was no final resolution at this time. Private company involvement in water persisted over time, in part because the idea that water should be public preceded the infrastructure and the funds to make this concept a reality. The period of 1883 to 1917 encompasses vital moments of change, heretofore overlooked, within

the long and slow transition to public management of New York's water. By 1917, this period of change had come to an end. New Yorkers and city officials considered water to be public. Although some private water companies remained, they operated under the oversight of the city and state.

Four forces prompted the City of New York to undertake water management: the severe drought of 1881, the cholera scare of 1892, the consolidation of Greater New York in 1898, and the political scandal involving the private Ramapo Water Company in 1899. The new City Charter for Greater New York did not allow the city the power of eminent domain for water supply. Furthermore, the city needed the State to handle any mediation over land issues with property owners upstate. The highly publicized scandal involving some politicians in collaboration with Ramapo leadership forced the city to make water public once and for all.

What changed between 1883 and 1917? The single most significant shift was that after 1905, the city government had finally begun to acquire the power and the legitimacy that it needed to make the permanent transition to the public management of water. By 1917, the city had effectively used these powers to complete the massive Catskills water system. Prior to 1905, the city lacked power and legitimacy for three main reasons. First, it had undermined itself by granting broad powers, especially of eminent domain, to private water companies, both in the 1790s and in the 1890s. Second, the city lacked the instruments of municipal finance it needed to fund water until the early twentieth century. Third, when the government did secure some degree of legal authority and power to act, it sabotaged itself through corruption and political patronage, as was the case when Boss Tweed ran the Department of Public Works in the 1870s. Years later, in reaction to the cholera scare of 1892, Daly's Raids of 1893 were an initial assertion of city government power to protect the water supply through decisive action and brute

force. The establishment of the Board of Water Supply and the State Water Supply Commission in 1905 marked a definitive shift to public ownership. However, permanent public management of water was not fully achieved until after 1915, when, at the end of a long struggle, the private Ramapo Water Company was finally defeated by a coalition of government officials and progressive reformers and when the city had begun to acquire the many private water companies operating across the boroughs. By expanding and using this new power definitively between 1905 and 1917, the government solidified its authority.

By examining social, cultural, and economic factors, investigating how everyday people interacted with public water and looking at how sites of infrastructure served both an educational and a promotional function, this study has sought to emplace the history of water into a wider context. The final victory of the public in winning control over the city's water supply was achieved not only by politicians in a top-down fashion but by ordinary citizens concerned about health and municipal reform. The current study builds on the scholarship of public health to show that after 1892, government officials began to establish a permanent bureaucracy to secure the safety of drinking water supply. The middle-class discovery of the "octopus" of municipal corruption was not only the rise of finance capitalism, but also the expansion of the private gas, electric, and streetcar companies, which schooled city residents in their vulnerability to monopoly.[1] The current study has made clear that water was also a large part of this story.

In addition to understanding public control of the city's water supply as a result of activities outside and beyond politics, this study has sought to widen the lens of urban history to take in the importance of the city's hinterlands, especially with regard to the narrative of sanitation upstate. This dissertation supports recent scholarship on cities, which argues that

[1] Daniel T. Rodgers, "In Search of Progressivism." *Reviews in American History,* Vol. 10, No, 4. (December, 1982): 113-132.

contemporary cities do not have their own internal coherence and cannot be considered a single unit. Rather, the boundaries of cities have stretched, in terms of geography and social structure, so that a city cannot be thought of as a united whole. We see this stretching of boundaries in the case of Greater New York as it encompassed the boroughs, but also as it reached further and further upstate for its water supply. Cities were not solely engines of competition, but rather were "generators of demand…, which possess the economic power of consumption and circulation."[2] In the case of water, New York City was clearly a generator of demand, for it required an ever-increasing amount of water. This demand for and consumption of water became a unifying force in New York, as the city government investigated water supply in the newly created five boroughs and sought to take over their private water companies one by one.

Further, this study has demonstrated that the notions of water as a public good and as a private commodity can exist simultaneously and that water has been commodity in New York since the 1750s. By building on the existing scholarship to provide a new synthesis that is cultural, economic, political, social, this study places water at the center, as an actor and a vehicle, through which to understand urban life. This integrative approach can serve as a model to inspire further research, applied to other cities across the globe. In New York, water became a public issue because neither the government nor private entities were solving the problems of water shortages and poor water quality. While the aim of this study was to tell the story of water becoming a public utility, the narrative turned out to be much more complicated involving private water companies, private charities, civic institutions, the city and state government as actors in the drama. Ultimately, water became and remained a public utility to be handled by the city in conjunction with the state, but contingency was central in this equation and the ultimate public management of water was not an inevitable conclusion. This study also reveals the power

[2] Ash Amin and Nigel Thrift, *Cities: Reimagining the Urban* (Blackwell Publishers, Inc.: Malden, MA. 2002), 8, 67.

and meaning of water and what it represented to the people of New York in 1842, in 1883, in 1890, and in 1917. No longer just a means for extinguishing fires, water had become a popular beverage by the end of the nineteenth century. Water represented hygiene and purity. To some, pure water could "civilize" the immigrant working class by reducing the prevalence of alcohol and by preventing the spread of disease. Water was a marker of civic pride, a source of employment, and to others, it was an instrument of temperance and a symbol of religious faith.

The history of New York City's water supply policy sheds light on the essence of urban change. As cities grew, municipal governments became increasingly responsible for the provision of services to citizens. The fact that, in 1814, New York City's Common Council asked local congregations to construct large cisterns to collect rain on church roofs in order to supplement the water supply for fire protection is largely unthinkable today. During the period of this study, cities began to rely on an evolving public policy apparatus to accommodate increasing populations, to assure good sanitation for public health, to oversee the administration and finance of essential utilities, and to prioritize the imperative of planning for the future.

EPILOGUE

New York City's water system has been under construction intermittently since the 1830s. The massive system now consists of three aqueducts which bring water in from outside the city, eighteen reservoirs, six distributing reservoirs, three controlled lakes, four tunnels connecting the reservoirs, and three tunnels and 6,000 miles of gravity-fed water mains that distribute the water within the city. These component parts combine to supply the city's nine million people with 1.3 billion gallons of water per day from a public water system with water drawn from the largest catchment area in the world. Remarkably, New York's drinking water remains unfiltered to this day. [3]

But, all is not rosy. New York's water system is in danger of falling apart. Of the three city water tunnels, one, City Tunnel #3 is yet to be completed. Although construction began in 1970 and the first section opened in 1998, City Tunnel #3 will not be finished until 2020. Repair work on City Tunnels #1 and #2, completed in 1917 and in 1936 respectively, will necessitate and complete shut-down which cannot commence until City Tunnel #3 is completed. Such a shutdown would be possible only once City Tunnel #3 is operational. Moreover, there are questions about the ability to restart water supply to tunnels #1 and #2, after they have been shut down for the needed maintenance work. The city's combined sewer system, built in 1849, collects both street run-off and sewage in the same set of pipes. This means that when back-ups occur due to heavy rain, the city is forced to use relief valves to dump sewage

[3] Greenberg, *Waterworks*, 2-4. Filtration plants are under construction today but are not yet operational. Because the system is gravity-driven and because of the turgidity of the water in reservoirs, filtration has not been needed until recently.

into local water. New York's infrastructure needs maintenance and its sewer system needs a major overhaul.[4]

A major overhaul of the attitude of New Yorkers, specifically, and Americans, more generally, toward water is also imperative. We take our water infrastructure for granted as we do our water supply. Our perception of the value of water presents challenges to water policy. We view clean water as infinite in supply and available twenty-four hours each day for little cost, when in fact, fresh water is our most precious and increasingly scarce resource.[5] Yet our idea that public water should be free of charge persists. Chuck Wachtel's 1983 novel, *Joe the Engineer*, documents the daily life of Joe, a water meter reader working in Brooklyn and Queens. At each house he visits to read the water meter and assess water charges, he is greeted by a resident who questions why she needs to pay for water. One visit proceeds as follows:

> "How come we gotta pay for water anyway?"
> She's not letting him down. It's the same conversation he'll have at every doorstep in the neighborhood.
> "Ya get a piece of the reservoir, ya gotta pay for it."[6]

At another house, when a resident asks why she has to pay for water, Joe responds that she does not need to. "She can drill her own well and install a pump if she wants to, or drive out to a lake once a week and store the water in her bathtub, or put a barrel under her rain gutter, or water her rosebushes with Coca-Cola. But if she didn't want to do any of these things, she would have to let Joe go downstairs and read her meter."[7] Needless to say, she allows him in.

Today, twenty-nine years after Watchel's book was published, this perception that public water should be free of charge persists. Its costs millions of dollars to manage a massive water

[4] Prud'homme, Alex. *The Ripple Effect: The Fate of Fresh Water in the Twenty-First Century* (New York: Scribner, 2011), 53.
[5] Prud'homme, *The Ripple Effect*, 9 -13.
[6] Chuck Wachtel, *Joe the Engineer* (Penguin Books: New York), 1983, 96.
[7] Chuck Wachtel, *Joe the Engineer* (Penguin Books: New York), 1983, 101.

supply system, yet we refuse to value water at its worth. While public water is not free, we tend to treat it as if it is. At the same time, bottled drinking water has secured its place as a commodity for sale, for which we will willingly pay. As we have seen, drinking water was a commodity in the 1760s when the Tea Water men pedaled buckets throughout lower New York, but now the selling of water operates on a colossal scale. American bottled water is a billion-dollar industry, that is dominated by four companies: Pepsi, Coca-Cola, Nestle, and Dannon.[8] While Nestle's Poland Spring and Danone's Evian are "spring waters" from specific water sources alleged to be clean,[9] Coca Cola's Dasani is water from London's public water supply and Pepsi's Aquafina is filtered water from "public water sources."[10] The water quality of bottled water is no better than public sources in America. In fact, public water is tested multiple times per day for safety while bottled water quality is not actively regulated in the United States.[11] Nevertheless, Americans spent $15 billion on bottled water in 2006. "Consumers have an affection for bottled water. It's not an issue of taste or health, it's about convenience," a bottled water industry newsletter reported in 2007, "Try walking up [New York City's] Third Avenue on a hot day and getting a glass of tap water."[12] Of course, there is another solution, namely, public drinking water fountains. Some American cities have made an effort to install drinking water fountains in recent years (figure 6.1), but many more would be needed to overcome our predilection for bottled water.

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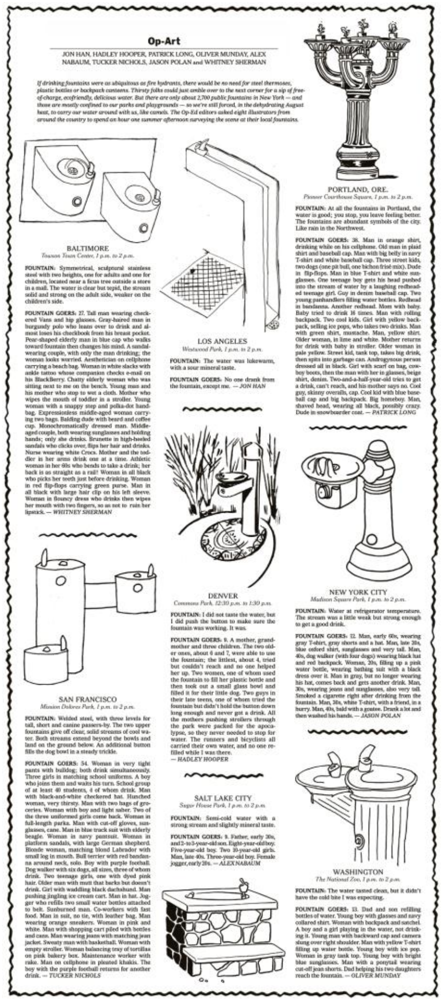
[8] Prud'homme, *The Ripple Effect*, 293.
[9] Aquafina labels to spell out source – tap water. CNN.com. Accessed September 29, 2011, http://www.cnn.com/2007/HEALTH/07/27/pepsico.aquafina.reut/
[10] Coca-Cola Admits That Dasani is Nothing But Tap Water, CommonDreams.org, Accessed September 29, 2011, http://www.commondreams.org/headlines04/0304-04.htm. Aquafina labels to spell out source – tap water. CNN.com. Accessed September 29, 2011, http://www.cnn.com/2007/HEALTH/07/27/pepsico.aquafina.reut/
[11] See documentary film, *Tapped* (2009) directed by Stephanie Soechtig.
[12] Aquafina labels to spell out source – tap water. CNN.com. Accessed September 29, 2011, http://www.cnn.com/2007/HEALTH/07/27/pepsico.aquafina.reut/



Op-Art

JON HAN, HADLEY HOOPER, PATRICK LONG, OLIVER MUNDAY, ALEX NABAUM, TUCKER NICHOLS, JASON POLAN and WHITNEY SHERMAN

If drinking fountains were as ubiquitous as fire hydrants, there would be no need for steel thermoses, plastic bottles or backpack canteens. Thirsty folks could just amble over to the next corner for a sip of free-of-charge, ecofriendly, delicious water. But there are only about 2,700 public fountains in New York — and those are mostly confined to our parks and playgrounds — so we're still forced, in the dehydrating August heat, to carry our water around with us, like camels. The Op-Ed editors asked eight illustrators from around the country to spend an hour one summer afternoon surveying the scene at their local fountains.

BALTIMORE
Towson Town Center, 1 p.m. to 2 p.m.

FOUNTAIN: Symmetrical, sculptural stainless steel with two heights, one for adults and one for children, located near a ficus tree outside a store in a mall. The water is clear but tepid, the stream solid and strong on the adult side, weaker on the children's side.

FOUNTAIN GOERS: 27. Tall man wearing checkered Vans and hip glasses. Gray-haired man in burgundy polo who leans over to drink and almost loses his checkbook from his breast pocket. Pear-shaped elderly man in blue cap who walks toward fountain then changes his mind. A sandal-wearing couple, with only the man drinking; the woman looks worried. Aesthetician on cellphone carrying a beach bag. Woman in white slacks with ankle tattoo whose companion checks e-mail on his BlackBerry. Chatty elderly woman who was sitting next to me on the bench. Young man and his mother who stop to wet a cloth. Mother who wipes the mouth of toddler in a stroller. Young woman with a snappy step and polka-dot handbag. Expressionless middle-aged woman carrying two bags. Balding dude with beard and coffee cup. Monochromatically dressed man. Middle-aged couple, both wearing sunglasses and holding hands; only she drinks. Brunette in high-heeled sandals who clicks over, flips her hair and drinks. Nurse wearing white Crocs. Mother and the toddler in her arms drink one at a time. Athletic woman in her 60s who bends to take a drink; her back is as straight as a rail! Woman in all black who picks her teeth just before drinking. Woman in red flip-flops carrying green purse. Man in all black with large hair clip on his left sleeve. Woman in flouncy dress who drinks then wipes her mouth with two fingers, so as not to ruin her lipstick. — *WHITNEY SHERMAN*

SAN FRANCISCO
Mission Dolores Park, 1 p.m. to 2 p.m.

FOUNTAIN: Welded steel, with three levels for tall, short and canine passers-by. The two upper fountains give off clear, solid streams of cool water. Both streams extend beyond the bowls and land on the ground below. An additional button fills the dog bowl in a steady trickle.

FOUNTAIN GOERS: 54. Woman in very tight pants with bulldog; both drink simultaneously. Three girls in matching school uniforms. A boy who joins them and waits his turn. School group of at least 40 students, 4 of whom drink. Man with black-and-white checkered hat. Hunched woman, very thirsty. Man with two bags of groceries. Woman with boy and light saber. Two of the three uniformed girls come back. Woman in full-length parka. Man with cut-off gloves, sunglasses, cane. Man in blue track suit with elderly beagle. Woman in navy pantsuit. Woman in platform sandals, with large German shepherd. Blonde woman, matching blond Labrador with small log in mouth. Bull terrier with red bandanna around neck, solo. Boy with purple football. Dog walker with six dogs, all sizes, three of whom drink. Two teenage girls, one with dyed pink hair. Older man with mutt that barks but doesn't drink. Girl with waddling black dachshund. Man pushing jingling ice cream cart. Man in hat. Jogger who refills two small water bottles attached to belt. Sunburned man. Co-workers with fast food. Man in suit, no tie, with leather bag. Man wearing orange sneakers. Woman in pink and white. Man with shopping cart piled with bottles and cans. Man wearing jeans with matching jean jacket. Sweaty man with basketball. Woman with empty stroller. Woman balancing tray of tortillas on pink bakery box. Maintenance worker with rake. Man on cellphone in pleated khakis. The boy with the purple football returns for another drink. — *TUCKER NICHOLS*

LOS ANGELES
Westwood Park, 1 p.m. to 2 p.m.

FOUNTAIN: The water was lukewarm, with a sour mineral taste.

FOUNTAIN GOERS: No one drank from the fountain, except me. — *JON HAN*

DENVER
Commons Park, 12:30 p.m. to 1:30 p.m.

FOUNTAIN: I did not taste the water, but I did push the button to make sure the fountain was working. It was.

FOUNTAIN GOERS: 9. A mother, grandmother and three children. The two older ones, about 6 and 7, were able to use the fountain; the littlest, about 4, tried but couldn't reach and no one helped her up. Two women, one of whom used the fountain to fill her plastic bottle and then took out a small glass bowl and filled it for their little dog. Two guys in their late teens, one of whom tried the fountain but didn't hold the button down long enough and never got a drink. All the mothers pushing strollers through the park were packed for the apocalypse, so they never needed to stop for water. The runners and bicyclists all carried their own water, and no one refilled while I was there.
— *HADLEY HOOPER*

SALT LAKE CITY
Sugar House Park, 1 p.m. to 2 p.m.

FOUNTAIN: Semi-cold water with a strong stream and slightly mineral taste.

FOUNTAIN GOERS: 8. Father, early 20s, and 2-to-3-year-old son. Eight-year-old boy. Five-year-old boy. Two 10-year-old girls. Man, late 40s. Three-year-old boy. Female jogger, early 20s. — *ALEX NABAUM*

PORTLAND, ORE.
Pioneer Courthouse Square, 1 p.m. to 2 p.m.

FOUNTAIN: At all the fountains in Portland, the water is good; you stop, you leave feeling better. The fountains are abundant symbols of the city. Like rain in the Northwest.

FOUNTAIN GOERS: 38. Man in orange shirt, drinking while on his cellphone. Old man in plaid shirt and baseball cap. Man with big belly in navy T-shirt and white baseball cap. Three street kids, two dogs (one pit bull, one bichon frisé mix). Dude in flip-flops. Man in blue T-shirt and white sunglasses. One teenage boy gets his head pushed into the stream of water by a laughing redheaded teenage girl. Guy in denim baseball cap. Two young panhandlers filling water bottles. Redhead in bandanna. Another redhead. Mom with baby. Baby tried to drink 16 times. Man with rolling backpack. Two cool kids. Girl with yellow backpack, selling ice pops, who takes two drinks. Man with green shirt, mustache. Man, yellow shirt. Older woman, in lime and white. Mother returns for drink with baby in stroller. Older woman in pale yellow. Street kid, tank top, takes big drink, then spits into garbage can. Androgynous person dressed all in black. Girl with scarf on bag, cowboy boots, then the man with her in glasses, beige shirt, denim. Two-and-a-half-year-old tries to get a drink, can't reach, and his mother says no. Cool guy, skinny overalls, cap. Cool kid with blue baseball cap and big backpack. Big homeboy. Man, shaved head, wearing all black, possibly crazy. Dude in snowboarder coat. — *PATRICK LONG*

NEW YORK CITY
Madison Square Park, 1 p.m. to 2 p.m.

FOUNTAIN: Water at refrigerator temperature. The stream was a little weak but strong enough to get a good drink.

FOUNTAIN GOERS: 12. Man, early 60s, wearing gray T-shirt, gray shorts and a hat. Man, late 20s, blue oxford shirt, sunglasses and very tall. Man, 40s, dog walker (with four dogs) wearing black hat and red backpack. Woman, 20s, filling up a pink water bottle, wearing bathing suit with a black dress over it. Man in gray, but no longer wearing his hat, comes back and gets another drink. Man, 30s, wearing jeans and sunglasses, also very tall. Smoked a cigarette right after drinking from the fountain. Man, 30s, white T-shirt, with a friend, in a hurry. Man, 40s, bald with a goatee. Drank a lot and then washed his hands. — *JASON POLAN*

WASHINGTON
The National Zoo, 1 p.m. to 2 p.m.

FOUNTAIN: The water tasted clean, but it didn't have the cold bite I was expecting.

FOUNTAIN GOERS: 13. Dad and son refilling bottles of water. Young boy with glasses and navy collared shirt. Woman with backpack and satchel. A boy and a girl playing in the water, not drinking it. Young man with backward cap and camera slung over right shoulder. Man with yellow T-shirt filling up water bottle. Young boy with ice pop. Woman in gray tank top. Young boy with bright blue sunglasses. Man with a ponytail wearing cut-off jean shorts. Dad helping his two daughters reach the fountain. — *OLIVER MUNDAY*

Figure 6.1.:Op-Art: Thirsting for Fountains, *The New York Times*, August 14, 2009.

New York City's Department of Environmental Protection has launched a new campaign called "NYC Water-on-the-Go" to make free public drinking fountains available on city blocks. These fountains are portable and move throughout the city where they are hooked up to a fire hydrant at the appointed spot allowing passers-by to drink from them and to fill their personal water bottles from the spigot (figure 6.2).

Figure 6.2: Photograph of New Yorkers at NYC Water Fountain, taken by the author, June 22, 2012.

New Yorkers can track where the fountains will be located by downloading the free smart phone application that shares this information. The campaign has even branded the city's public water as "nyc water" and developed the promotional campaign as displayed on a business card distributed at the fountains (figure 6.3).[13] But, the question remains, can "nyc water" compete

Figure 6.3: Business card for NYC Water campaign, 2012. Courtesy of the Department of Environmental Protection.

[13] The official text of the campaign reads: "The New York City Department of Environmental Protection is showcasing the City's award-winning, high-quality great-tasting, healthy tap water—NYC Water—through its Water-On-the-Go program. Together with you as our partner, we are keeping New Yorkers hydrated at Water-On-the-Go fountains at special events throughout the five boroughs. The portable fountains offer six faucets for direct drinking or filling water bottles and make NYC water easily accessible to attendees at your event." New York City Government Website, Drinking Water, accessed June 26, 2012, http://www.nyc.gov/html/dep/html/drinking_water/wotg.shtml

with private and bottled water?

The privatization of water started to take place across the globe in the 1990s.[14] Privately supplied water is big business today. Ten percent of the global population depends on water supplied by private companies, which collect, purify, and deliver water while maintaining infrastructure and treatment plants for wastewater.[15] Across the globe, urban water supplies were privatized throughout the 1990s. Critics of privatization have wondered what this says about the strength of municipal governments. Do we need a more sophisticated public sphere in which the people are more engaged in water policy?[16] A United Nations report from 2006 found: "Water insufficiency is often due to mismanagement, corruption, lack of appropriate institutions, bureaucratic inertia, and a shortage of investment in both human capacity and physical infrastructure."[17] The World Bank is conducting a study of private water in the developing world. It is ironic that the United States, which favors private ownership in general, still leads the way in terms of publicly-owned water systems.[18] Water was the first public utility in American cities, demonstrating urban commitment to growth.[19] Perhaps this historical precedent has contributed to the security of public water in America and to the inability of private water companies to take-over urban water in the United States.

Ground water is the main point of contention in today's water wars. Riparian rights in New York State, based originally on British common law, allow property owners to use the water found on or under their property. This use must be "reasonable" and what is reasonable is determined in the courts. In the western United States, riparian rights are dictated by

[14] Goubert, *The Conquest of Water*, 180-181.
[15] Prud'homme, *The Ripple Effect*, 266.
[16] Greenberg, *Waterworks*, 21.
[17] Prud'homme, *The Ripple Effect*, 194.
[18] Scott E. Masten, "Public Utility Ownership in 19th Century America: The "Aberrant" Case of Water," *American Law & Economics Association*. Berkeley: Berkeley Electronic Press, 2009, 43.
[19] Melosi, *Precious Commodity,* 111-114.

appropriation, based on Spanish and Latin law, meaning that whoever claims right to the water first, gains the water source.[20] In many ways, New York's water system has more in common with Las Vegas' water issues, in that both have to bring water in from outside.[21] Today, in the United States, the privatization of water is gaining support in certain states and localities.

Tensions between public and private management persist. We now face a new trend of governments turning with increasing frequency to the private sector to manage services ranging from public health to prisons. This trend can be seen as part of a "neoliberal policy shifts" such as deregulation and reliance on "market mechanisms."[22] Policy makers today weigh public corruption versus private coercion and today, a predominant trend seems to be this neoliberal faith in the private sphere. Yet, at the same time, the belief in the publicity of government coexists in the notion that government affairs should be conducted transparently and in public with the participation of the people, as a check on public corruption. More and more, American tradition seems to be a blend of the public and the private. [23]

In many ways, the distinction between public and private does not hold. Can a municipal water system ever be fully public given the subcontracting of projects to private contractors and the large number private companies that are involved in water? Water shows how porous the line between public and private can be. New York's water remains publicly managed, but private natural gas companies practicing hydraulic fracturing, known as "fracking," now threaten this public supply. Fracking is the process of extracting natural gas from underground shale.[24] Such shale is prevalent in upstate New York, and gas companies are offering large compensation

[20] Prud'homme, *The Ripple Effect*, 139-140.
[21] Prud'homme, *The Ripple Effect*, 118.
[22] Novak, *Public Private Governance*, 23
[23] Novak, *Public Private Governance*, 38. See also Karen Bakker, *Privatizing Water: Governance Failure and the World's Urban Water Crisis* (Ithaca: Cornell University Press, 2010) for a compelling discussion of how private and government provision of water coexist in an international context.
[24] For an informative documentary on present-day fracking, see Josh Fox's *Gasland*, 2010.

packages to farmers and property owners who permit fracking on their land. A side effect of fracking is that toxic liquids may seep into the water supply. Should fracking become widespread, New York would be forced to filter its water supply at billions of dollars in cost.[25] Other potential dangers to the water supply that could be caused by fracking may be far more detrimental to the purity and safety of New York City water.

In New York, there is growing support for public water from the general public and more awareness about the role of water in urban life, especially now that the threat of fracking exists. This mural of the Groundswell Community Mural Project in conjunction with the Department of Environmental Protection from 2008 called "Water Is the Life of NYC" communicates this important sentiment (figure 6.4).

Figure 6.4: Water Is the Life of NYC, mural located in Park Slope, Brooklyn, New York. Accessed June 12, 2012, http://www.nyc.gov/html/nycwater/html/about/about_the_mural.shtml

[25] Prud'homme, *The Ripple Effect*, 282-283.

Youth artists worked on this mural together. After learning about the city's intricate and extensive water system during the process, these youth produced a piece of public art that calls for conservation and protection of New York's water supply.

Which begs the question, is water a right or a privilege? In July 2010, the General Assembly of the United Nations adopted a resolution that recognizes access to clean water as a human right.[26] New Yorkers today see water as a right, something to which members of all economic classes are entitled and for which they should not have to pay. However, even under a publicly managed system, citizens remain water customers who pay for the water they use, as residences are now metered. As this study has shown, in an urban setting, pure drinking water, whether publicly or privately managed, was never free of cost.

[26] General Assembly, GA/10967, accessed November 11, 2011, http://www.un.org/News/Press/docs/2010/ga10967.doc.htm

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