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At the Confluence of Science and Power: Water Struggles of New Orleans in the Nineteenth Century

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AT THE CONFLUENCE OF SCIENCE AND POWER:
WATER STRUGGLES OF NEW ORLEANS IN THE NINETEENTH CENTURY

A Dissertation

Submitted to the Graduate Faculty of the
University of New Orleans
in partial fulfillment of the
requirements for the degree of

Doctor of Philosophy
in
Urban History

by

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Abstract

New Orleans failed to solve its water infrastructure problems in the nineteenth century because a shifting locus of power in a variable political and financial environment hampered wise decision making, while technology choices were limited by contemporary knowledge, scientists' ignorance, or by technicians' poor presentation skills for new ideas. And, selection was often governed by prejudice: personal, racial, or against technology. New Orleans was able to deal with its water difficulties only when those with the power to make or influence decisions had an available technology capable of handling the problem and they chose to use it. Power and science had to flow together.

New Orleans's situation is excellent: a crossroads of trade, an entrepot for the agricultural heartland, the Mississippi River's premier port. And yet, the city's site is dreadful. New Orleans sits in a bowl of land rimmed by water, with the river and the brackish Lake Pontchartrain on either side, amid swampy environs in a hot and wet climate.

This city exists only because of the complex system by which it deals with water. The conundrum of New Orleans lies at the confluence of science and power. Whoever holds the power can choose the science and technology with which New Orleans handles water, its ever-present best friend and worst enemy.

From the colonial era to the twentieth century, the power to make those choices shifted from the private sector to the public sector and back, with the press and, eventually, women ultimately having influence. Under the fading Spanish empire, from the age of Jefferson to the era of Jacksonian democracy, during the Civil War and Reconstruction, through the dawn of Progressivism: New Orleans confronted the problems of flood prevention, drainage, the omni-

present need for a dependable water source for its citizens, and eventually sewerage disposal.

This study investigates how those problems were faced, what technology was used and how the work was financed; and also illuminates the lives of those who dealt with New Orleans and water during that time.

Introduction

Water rules New Orleans – or does New Orleans rule water?

Water provided the rationale for the city's location. The situation was ideal: a point on the banks of a river that drained the vast interior and served as a route for trade. The land at this riparian point was higher, raised by increments from sediment dropped by annual overflow. Nearby was a large brackish lake, accessed by a small stream a mere portage away from the edge of the mighty river. This lake could be reached by water from the gulf and the open sea, and on its northern shores inland rivers provided access to the lands beyond. Across the river from the new city, a tangle of sluggish bayous wound down to the gulf. New Orleans was placed at a crossroads, with three ways of access to the ocean and a multitude of watery paths to the interior of the continent.

Water was never far away. Besides the open river and lake and bayous, water passively filled the swamps that edged the dry land, water oozed and flowed with tides through the marshes where the salty sea lapped over the grasses, water came in torrential rains from the heavens, water seeped up from the ground where it lurked in oozing strata just below the roots of the vines and trees that covered the fertile earth with green. Stranger still, water was always lurking above the very land where the city was placed, for New Orleans huddles in a bowl of earth ringed by the higher levels of the lake and river, the concave silhouette of the land broken only by elevated lines where other streams had marked their courses in the past.

The water surrounded the city and, when weather and luck failed, the water might soak and flood and cover the land where the city so tenuously stood.

If the site of the city was a wretched one, its situation – the city’s place in regard to neighboring places – was sensible. The city was founded in 1718, at the location chosen by French Canadian Jean Baptiste LeMoyne Sieur de Bienville, after he and his brother Pierre LeMoyne Sieur d’Iberville considered settlement possibilities in the years after an exploratory trip of 1699. The choice was sound: France needed a market outpost for trading on the lower Mississippi River. While surrounded by wetlands, the city would be predominantly dry, with a location on a natural levee of the river, on land built up by centuries of flooding. The French in Canada and along the upper Mississippi would have a new source for furs and another outlet for trade. Besides, the French could lay claim to a larger swath of North America when the New Orleans area, the gateway to the river route, was secure.

Added to those considerations was the city’s position on water routes through which trade could flow. Besides the route up the Mississippi River, New Orleans could be reached through Lake Pontchartrain, from which Bayou St. John led to a point a short portage from the river bank. The lake also offered market routes up the rivers that fed into its northern shore from the inland South. In a third approach, shallow draft craft could come up from Baratavia Bay on the Gulf of Mexico through shallow bayous on the West bank of the river to a point just across from the city. Thus, trade routes and a strategic location for defense were the deciding factors for the decision on where the settlement of New Orleans would be. ¹

Approaching by the river, the view that early explorers had of Louisiana terrain was in many ways similar to what is seen by a traveler today – brown river water lapping at a shoreline of willow trees and canes, with oaks on higher land providing a low mound of horizon. On Lake

Pontchartrain, the shoreline verges into cypress-filled swamps. The modern city still perches between these liquid expanses, tentatively grasping what dry earth there is, fighting back watery encroachment with levees and pumps and canals and ditches.

Still today, the need to keep water out, to prevent the Mississippi River or Lake Pontchartrain from overflowing the city built on the land between them, or to drain out rainfall, remains a constant struggle. Hurricanes, the great storms that arise off the coast of Africa and roar inland from the gulf, have hit the city with regularity, from one in 1722 that flattened the four year old settlement to the monumental Katrina in 2005. And yet, water – the need for useful water – still rules the city. The simple act of sipping a glass of pure, clean water was, for the early citizens, merely a hoped-for dream. How that dream became reality, and how the city conquered – or held at bay – the threat of drowning by its own environs, involves conflict on two distinct battlefields.

One front of the struggle is power: the power of agency to influence decisions, the power of money to finance works, the power of political strength to govern civic decision-making, the power of personality in individuals who affect the city's life. The other field of conflict is science: the acceptance of knowledge of how to accomplish civic works, knowledge of mathematics, and engineering and medicine, of all the fields of inquiry that the technology and culture of the modern age could devise and use for humanity's betterment. New Orleans was committed to wage this two pronged conflict because of its destiny as a major port city of the United States.

It is at the confluence of science and power that the stream of modern civic progress has its source, and as we follow the course taken in the city of New Orleans in the struggle with water, we gain understanding of the circuitous route that progress has followed. The period

under consideration--the nineteenth century--had its beginnings in the era of two revolutions: the industrial revolution in England and the revolutions in government in both France and America. Thus, the period opened with radical changes in both science and power.

A meteoric rise in scientific techniques and inventions began late in the eighteenth century, revolutionized industry in England, spread through the world, and by the twentieth century, the new marvels of science had transformed civilization with steam power, electricity, the internal combustion engine and a myriad of other miracles. The exchange of technologies, the spread of that knowledge and the education of practitioners of new scientific methods, evolved during that period from the era of the gifted individual who dabbled in various experimental schemes and worked in several disciplines, to the time of the trained engineer, product of the university system, who would be responsible for creation of the great infrastructure projects of the twentieth century.²

In the late eighteenth century, the French Revolution changed forever the concept of political power structures. While the American Revolution introduced the concepts of participatory democracy in North America, the French Revolution brought that idea to Europe and the world, and introduced radical ideas that would continue to haunt governments that sought to combine capitalism with popular rule. The French Revolution was a necessary prelude to Napoleon's rise to power. Louisiana's fate was in Bonaparte's hands, and it was his sale to the United States of the Louisiana Territory, and the city, or the "Isle of Orleans," that put the city into American possession and ushered in the modernization of city services over time. New Orleans, from its reception into American ownership, became part of the emerging American system of government, and prey to the vagaries of the American economy. The trends that swept

the United States affected the city of New Orleans, and thus the city's actions on infrastructure were similar, in many ways, to that of other contemporary American cities.

The period from just prior to 1800 up to the twentieth century thus defines a time in which the introduction of new ideas on the scientific and political fronts took root, grew, and matured into what would become our modern era. Cities, as we know them, were changed and augmented in this era, because those who worked to improve them put that new knowledge and those new techniques into practice.³

Writing a history of public works, the building of infrastructure, involves a range of disciplines. Constructing a text concerning how the City of New Orleans has dealt with water will include not only an exploration of the individuals involved, their skills and motivations, but also an inquiry into the milieu in which they operated, the characteristics of the city and its governance, and an investigation into how the system that furnished useable water for the city was conceived, designed, financed, constructed and operated at different times.

The New Orleans struggle with water, the contretemps between the city, a major port and a necessity to the national economy, and its spongy, aqueous surround, is firstly symptomatic of man's conceit in daring to wrestle with nature. In terms used by geographers, the "site" of New Orleans, the real estate the city occupies, is deplorable: swampy and prone to flooding. New Orleans, because of its location between the Mississippi River and Lake Pontchartrain, has suffered from the same difficulties with water from its beginnings. As the population grew, the wet environs became the source of misery, as swamp-bred mosquitoes spread yellow fever and contaminated drinking water spread cholera among the populace. The physical problems of this location had been unchanged for the centuries since the Mississippi River churned out its current path. The Mississippi River has a delta, a triangle shaped area of land on which sediments are

deposited toward the river's mouth. The city of New Orleans sits atop the mud of those deposits, some seventy feet above bedrock, the Pleistocene geologic layer. As the river whipped around over this low-lying land, it cut different paths, and along the banks of each path it built up a layer of sediment, a natural levee. New Orleans' original site, today's French Quarter, sits on such a natural levee, and other older levees run through today's city along old river courses forming hillocks in the basin between the river and the lake.⁴

New Orleans may be an American city, but its civic antecedents were set in European tradition. If the official language of English was decreed acceptable at the Louisiana Purchase, a good portion of the populace continued to dream, squabble, and conduct their lives in French. Even in the forty year rule of the Spanish Empire, the recalcitrant Orleanians sang and danced and dueled in French. And while English dominated local speech more and more as the years passed, the city still retained its own interior dialect and held to shreds of a culture of its own. As differing political philosophies moved across the United States, New Orleans still interpreted for itself, changing and reacting in its own rhythms, and it was in this manner that the city edged toward modernity in the centuries after its founding, never quite letting go of its past.

While New Orleans' original city planning was a brief sketch of a typical fortified market town drawn by assistant French Army Engineer LeBlond de la Tour, the traditions behind that tidy rectangular plan rested on centuries of experience. A history of the built environment of cities could encompass a simple chronological narrative, detailing a saga of rising needs, technological advancements, construction and financing and then maintenance of all those modern necessities that cities of today require. However, this linear view is myopic, leaving unrevealed the fact that each step on the narrative course may have far-off antecedents and consequences that will and did affect other steps along the path. Simply following chronology

does not explore the full story, since development occurs in response to contradictions and problems. It is those contradictions and problems, the intersecting worlds of government and finance; the factors of scientific knowledge and shifting public opinion that, when explored, can give us a more nuanced view of the phenomena that make up the built city.⁵

City building is rather an information system, selecting and simplifying facts to develop criteria and possible options. The options and criteria considered at each stage depended on what were cities' primary concerns at the time. Over the past millennium, city building has proceeded in stages, each one governed by different over-riding factors and fears. Cultural needs governed city building from the early Middle Ages to the late seventeenth century, and in this era the primary threats to cities were revolts and civil disorders. Economic considerations came first from the late seventeenth into the nineteenth century, and in this era the greatest perceived threats came from epidemics and fires. Since then, political and social institutions have had most effect on city building, and now the ultimate destructive threat to cities is war.⁶

Italian artists in the fourteenth and fifteenth centuries altered methods of building construction and design criteria. Filippo Brunelleschi in Florence was first to create the role of a single planner, or architect, with artisans laboring under his sole direction. Thus a building could be completed in a matter of months or a few years, not the generations of labor medieval cathedrals had required. Leon Battista Alberti in Rome was first to insist that the style and placement of a building should integrate it into the life of the citizens, a change from the haphazard medieval cityscape of mansions and hovels indiscriminately placed. Cities in the western world began to exhibit standardized architectural and engineering features, beginning in the late seventeenth century. Local building traditions survived only as romantic manifestations

of culture, and after the great fire of London in that era, costs for reconstruction began to be passed to citizens, not completely assumed by the state.⁷

By the eighteenth century when New Orleans was born, the connection between the economics of trade and urban expansion could be seen in the improvements to port cities, such as Antwerp, Belgium, and in the creation of the water system at Nimes, France, where silk manufacturers required a complex network of water mains and canals, designed by engineers. This water system deliberately tied together the old and new parts of Nimes, and even the remaining medieval city walls now were removed. The eighteenth century also saw the rise of the importance of city mapping, with Paris, among other cities, getting its first proper map with a triangulated geodetic matrix. This resulted not only in facilitating taxation and zoning regulation, it also set the pattern for new suburbs and new towns to be laid out in grids.⁸

By the early nineteenth century economic needs dominated the cityscape. Industrialization not only exacerbated living quarter separation according to class, but new techniques resulted in prefabricated iron buildings and other construction methods that resulted in a less adaptable, or changeable, city. Massive buildings of cast iron, or brick and stone could not easily be torn down. Dense and inexpensive housing for the poor filled immediate needs and then became indispensable and remained in use long after its physical lifespan was ended. In addition, urban fires -- previously so frequent -- began to occur less often, mainly because the growing insurance business insisted on more fireproof building styles. Materials for fireproof construction became more easily available. And, cities began to face the need to expand, not only to accommodate and service larger and more demanding populations, but also to meet the needs of burgeoning economies. The result in Paris was the large-scale planning done by Baron Georges Hausmann.⁹

Planning of cities and their structures began as a quest for order in the urban center. In Hausmann's case, the order was imposed from above: as the Prefet of the Seine Department he had the Emperor of France's authority behind him. There was little or no international exchange of information on urban planning. Hausmann invented as he worked. He respected property rights and kept much from the past, both in buildings and in patterns of land use and finance. However, he modernized economic support for his efforts, standardized building techniques, cut through new streets, and widened boulevards (presumably to facilitate military intervention in urban riots.) Hausmann was not forward thinking: his plans for buildings did not allow for indoor plumbing or for elevators, both of which were in use by the mid-nineteenth century. After Hausmann, Paris could only grow outwards, but his methods of building, financing and planning could be adapted elsewhere. By the late nineteenth century everything was in place for the final creation of what we know today as the modern infrastructure of cities.¹⁰

The word ``infrastructure`` at first referred to those parts of a military installation that remained in place during peacetime and first appeared with its current meaning in French in 1875. The term has layers of meaning: it at once describes physical assets, and also their economic, social and political role. Any discussion of the development of infrastructure covers four topics: the timing of development; the balance between public and private financing of development; the size of facilities built and the pricing formulas that set costs. Given that capitalism may be the driving force behind all modern city building, discussion should also investigate the transformation occurring within the economic system. The modern phase of city building, however, is more strongly tied to political and social institutions and criteria than economic factors.¹¹

The nineteenth century city became less of a collection of separate enclaves and more of an organic layout where everything was connected to everything else. At the same time, there was more separation between public life and private life. Street life became controlled. The cult of domesticity held sway. Furthermore, there were rising demands for a better quality of life. In the late 1800's, Americans awakened from pastoral, rural dreams to the squalid reality of congested cities, massed poor, and seemingly uncontrollable urban growth and decay. The history of American city planning can be seen as a trajectory beginning in a focus on physical order, societal control and monumental buildings. Reacting as to a moral outrage, city planning began with spiritual improvement schemes. Late nineteenth century Progressives believed that proper training and example, coupled with scientific research, would uplift the poor. Technology could be harnessed to the public good. The transformation of infrastructure which had begun in earnest with the beginnings of industrialization at the start of the nineteenth century was proceeding frantically by the last years of the 1800's. Public works assumed tremendous importance: they influenced policy, occasioned public discourse and changed the very face of the city. Their ``ubiquitous influence`` makes an understanding of infrastructure important. And, the nineteenth century belief in technology as the problem solver made the engineer the political creator of reform.¹²

The rapid rate of American urbanization resulted in immense and diverse difficulties. There would first be a time lag between the appearance of a problem to a recognition of its significance; then another time lag between mobilizing people to respond and then discovering a solution; and a third time gap before the problem was fixed with minimal uncertainty of result. For example, a city such as New Orleans, without potable water would react in this way as a waterworks was planned and built. The politics of public infrastructure concerned not only

changes in technology, but economic and social development, changing demands of government, and the recurring problem of the public debt. The building of infrastructure might be termed recursive, in that it is embedded in the fabric of both the city and the country. While it is an ingredient of development and renewal, it demands development itself, involving as it does all possible relationships of local politics.¹³

Technology through the nineteenth century spread spasmodically: final results might depend more on local political problems in execution rather than the technical feasibility of design, construction and installation. While it might have been technologically feasible for New Orleans to build a waterworks in 1803, contemporary political and financing questions and the inability to import goods during the War of 1812 kept construction delayed.¹⁴

Sometimes there are time lags in seeing a need and providing for the infrastructure to meet it. At the beginning of the nineteenth century the large cities of the Northeastern United States began to build water systems, beginning in Philadelphia and New York. New Orleans, one of the five largest cities in the country by the early 1800s, could soon follow suit. By the end of the century new systems were being built in small towns. Demand for water systems came because of both fire threats and health concerns. But, it was only when financing systems to handle debt were in place, and manufacturers of the pipes and pumps needed to put systems in operation were able to easily satisfy heightened demand, that water systems spread; in the thirty year period from 1870 to 1900 most growth occurred. Fire, health, and available financing were not the only reasons water systems became popular at that point. Capitalists' insistence on efficiency as helpful to business drove demand for any functional infrastructure.

How were they to be paid for? Since some parts of the infrastructure were profitable (fare generating transit lines, for example) they were privatized. Necessary, but not profitable

ventures like waterworks became the responsibility of the city itself. Another factor in the spread of water systems was availability of trained engineers -- in the first half of the century most engineers had no formal training. Later university training became available and professional standards were set.¹⁵

A similar pattern was followed in Europe. In France between 1800 and 1850 demand rose for a stable water supply in cities, but one of the factors working against adoption of built water systems was traditional reliance on water carriers, eviers (who also sold water on the streets of New Orleans late into the 1800s.) Besides bringing water to households and businesses, they were a traditional source of news and public opinion -- it was the eviers who led the mobs at Versailles in 1789, and they did not disappear from the streets of Paris until 1890. Also in France the difference between the older self-educated engineers and the university trained ones was manifested in the self taught men's insistence on using all lead piping; cast iron pipe was preferred by formally educated engineers (as in New Orleans when former military engineer Francis Ogden, in the 1820s, sought out cast iron pipe to expand the water delivery system.)¹⁶

When cities began piping in water, the next improvement would be piping out wastewater and sewage. When a new element was introduced (in early years, piped water) it created a destabilizing effect on the overall system: as when the old cesspools and street gutters were not large enough to handle the increased water used. Eventually a sewage system would be needed. Main factors considered in sewer building were economic needs, sanitation and health, and resource conservation. In New Orleans, the high water table and topography of the land provided additional challenges. Would a new system separate street runoff from wastewater and sewage? Sometimes yes, sometimes no. Nineteenth century London provided a model for a

large system to handle sewage, based on the work of English sanitarian Edwin Chadwick. In America by 1909, three quarters of the systems in place were combined for street runoff and sewage. Using the preferred method, New Orleans' early century projects created separate sewerage and drainage systems. ¹⁷

New Orleans' progress toward having a completed water infrastructure can be compared with that of other American cities, but it first must be traced along the dual pathways of power and science.

The first path to follow is that of power, specifically political power. Politically, New Orleans began the long nineteenth century under an absolute (though ineffective) Spanish monarchy. While American democracy brought in a Mayor and city government, New Orleans went through early Federalist and Jacksonian versions of that American system, struggled with defining the nature of the city itself – and even splitting into three municipalities – before coming under Federal occupation in the Civil War and then under three Reconstruction phases before going into a Bourbon Restoration, then machine politics, and an odd local combination of Progressive and machine rule by the beginning of World War I.

The power of decision-making in the city first went to Spanish appointees and Cabildo members who had purchased their seats, progressed through elected officials working closely with the financial community, with whom they sometimes overlapped, to military and federally appointed officials imposed from afar, through admittedly corrupt state officials, and then to a coalition of businessmen, women, and the electorate to bring Progressive wishes into reality. The power of agency finally moved to the people themselves: without their vote of approval for financing, the new systems could not be built, and their acquiescence to signing up and adding

their households to the system provided support for extension of networks so the system could function efficiently.

Through the changing political climate of nineteenth century America, New Orleans waterworks structured itself to suit the times. In the era of Jefferson, it began as a private corporation operating under a franchise, was brought under city ownership when it went bankrupt in the Jacksonian 1820s, was rebuilt by a bank capitalized for its construction in the 1830s with a franchise lasting until after the Civil War, when the waterworks again fell under city control as Reconstruction ended, was then again franchised by a corporation, and by the end of the century was, as befitted a Progressive era project, a public utility operating under a governing board, shielded from full control by politicians.

Scientifically, the period began with the early industrial revolution – and a steam pump for New Orleans' first waterworks – progressed through knowledge of diseases, as when cholera was proved by 1850 to be spread by contaminated water supplies, all the way through the proof that yellow fever, the city's scourge, was spread by mosquitoes, and that drainage of mosquito breeding grounds could eliminate that pest. Also on the technology front, the era began with a gifted man, Benjamin Latrobe, with diverse talent and experience in architecture and engineering, progressed through engineers who had their training in the military or on various nineteenth century projects across the country (Frances Ogden, Albert Stein, George Dunbar) and ended with engineers trained in American universities, George Earl and Baldwin Wood, who designed and embellished New Orleans' grand water projects of the early 20th century and at last provided the clear and pure water the city needed.

Inquiring into the history of New Orleans's water infrastructure involves not only the chronology of events and personalities, but takes in both European and American infrastructure

building, and the context of overall city building. Writing the history of public works involves a range of disciplines. Constructing a text concerning how New Orleans has dealt with water includes not only an exploration of the individuals involved, their skills and motivations, but also an inquiry into the milieu in which they operated, the characteristics of the city and its governance, and an investigation into how the water system was conceived, designed, financed, constructed and operated at different time periods. A potable water supply, an adequate drainage system for rainfall and ground water, protection from flooding, and a system for disposing of sewerage: these were the city's needs. What different ways might there be of exploring these topics? Further, how might a comparison be made between the pivotal figures, the problems and the solutions of New Orleans with those of other American cities?

Providing a city's water supply can only result from an investment in the infrastructure needed. It is difficult, if not impossible, to gauge the value of infrastructure investments: how do you value the quality of life resulting from drinkable water? How do you set a price on the industries that locate within the city's boundaries only because running water is available? A water system can be simply one of those necessary costs cities must absorb blindly. Different infrastructure networks may cost the same, but have vastly different yields of services. A water system has a "lumpy" investment pattern: a city cannot simply buy one, ignore maintenance, and never invest again. It is to be expected that there will be large capital investments needed over time. For example, a reservoir such as the one built in New Orleans in the 1830s, is costly to construct and may require both routine maintenance and periodic rebuilding. Nor can the city depend on the first one built lasting forever, and, indeed, it is difficult to predict how long any given water system once installed will be adequate. The big price tag items will come at random intervals and there is little a city can do to predict exactly what benefits it will receive for the

money spent or when money will be needed. There is also the question of the money source: water systems can be privately or publicly owned or run.¹⁸

Given the unpredictability of budgeting for waterworks, there are also simple facts of geography to consider: where will the water come from? Is the supply dependable? Then there are technical factors: how will the works be designed and constructed? And the personalities involved must be considered: who will be in charge? What sort of regime will make waterworks decisions? How do historians chronicle this story?¹⁹

A valid method of constructing a history of one city's water system might be by comparison. Analogies to New Orleans can be drawn with the process by which Houston, Texas, built itself as a city between 1830 and 1910. The building of Houston's infrastructure ``illuminates the interactions between the urban environment and its inhabitants,`` Even if people changed the environment around them by building cities, in the process they changed themselves: ``urban surroundings and institutions created city people.``²⁰

Houston's growth began, as did that of other new cities, when urban consumers wanted to keep up with their competitors. This drive to excel was evident throughout the period. Government policy was all-important in determining which infrastructures would be built, and when, and how they were financed. Utility companies were often private, but the government also provided some services. By the 1840's government was accustomed to dealing with providing services. By the Progressive era of the 1890's public demand for service grew -- and government accountability and probity was insisted upon (one of the first commission council reform urban governments was installed in Galveston right after the 1900 hurricane.)

As in other cities, a crisis brought results: the 1894 fire at St. Joseph's Infirmary resulted in the city's waterworks being rebuilt and switched from private to public governance. Similarly,

a violence-filled transit strike in 1898 exacerbated race and class struggles in Houston. Public services were not equally distributed and governmental financial problems resulting from capital improvements left elected officials vulnerable to citizens' complaints. National questions involving corporations and federal law directly affected how Houston could pay for public services. In essence, the Progressive reformer mayor could not find support for his neighborhood-based version of public control. The "emerging political economy of regulated capitalism" with for-profit franchises operating utilities, would be put in place by 1905.²¹

The pivotal year for Houston was 1900 -- Galveston, the port on the Gulf of Mexico that might have been Houston's major competition as an urban center, was devastated by a hurricane; and, oil, which was the fuel that would feed the Houston economic boom, was discovered in vast quantities in the region. The immediate result was that Houston's business community united, sought and got federal permission to pipe oil in and construct a deep water ship channel, and thus attracted the investment and national attention that assured that capitalism would be firmly in control. This hardened into a political structure in which the business elite controlled the city and set a pattern of service delivery that "hardened traditional patterns of racial and class discrimination into rigid lines of geographic segregation."²²

In Houston, the point at which the urban public first began to expect municipal services from their government occurred in the nineteenth century. Even if outside forces, courts and corporations were strong lobbyists in Houston government, it was the elected officials who chose to provide public services. The arguments were always over tactics and methods, not whether or not service would be provided. It was in the political arena that questions of costs and feasibility were decided, since "there existed a political, indeed an urban and political conditioning of the service technologies."²³

New Orleans's water solutions might also be compared with those sought by another Southern city, Memphis, Tennessee. Like New Orleans, Memphis is located on the Mississippi River. But Memphis sits above an aquifer, enabling wells to bring in spring water, and the nearby Wolf River and its tributaries could supply less muddy water than the Mississippi. By 1819, water carts were dispensing river water through the streets of Memphis. The next step, cisterns to collect rainwater, was the main water source for the next half century.²⁴

Public health concerns, civic pride, and quality of life demands occasioned the first Memphis waterworks plans -- all of which were canceled because of financial crises and then the Civil War. Meanwhile, recurrent yellow fever and cholera epidemics were taking a toll of the population. The private Memphis Water Company contracted with the city to supply water from the Wolf River in 1873, but the system was soon in financial difficulties and functioned inadequately.²⁵

By 1879 the city was desperate: a widespread depression had left the city bankrupt and even the waterworks was sold to the highest bidder, a Cincinnati, Ohio, firm. In 1885, the waterworks gained a new charter and was reorganized. The Wolf River water was cloudy and unpalatable and the city was unhappy with its water company contract. In 1886, Richard Graves, an entrepreneur, ordered an artesian well to be dug, and at 354 feet it hit the aquifer and water spouted five feet about ground level at the pump. The pure water was an occasion for civic rejoicing. By 1887, Graves had formed the Artesian Water Company and contracted to supply city water and the next year had absorbed the Memphis Water Company, and by 1889 there were more than 50 artesian wells serving the city, with businesses digging their own additional ones. Tunnels, pumps and standpipe were added and a city sewer system was begun.²⁶

Dr. George Waring, who had so strongly advocated building Memphis's sewers because

of communicable disease fears, ironically died of yellow fever, contracted during a government study of the disease in Cuba. Waring's radical sewer design for Memphis called for small pipes and a waste system separate from the street water drains. His ideas were later judged unacceptable. Through it all, the water company prospered, or at least its shareowners did. By 1893 it was obvious that too much had gone to dividends and not enough to maintenance and expansion, but the company continued its same pattern of profit-taking by its owners and barely adequate service for its customers. Only in 1903, after some complex maneuvers to ensure that Memphis firms would handle the enabling bond sale, did the City of Memphis purchase the water company and thus make its waterworks a publicly owned part of the city infrastructure.²⁷

The pattern of Memphis's waterworks construction is an unusual one. The city was somewhat late in offering a service. Even though the city was larger than Memphis and had a longer history, New Orleans was experimenting with a pumping station by 1819 and Memphis waited half a century later to attempt this. Memphis stayed in private ownership until the Progressive era, which is a pattern many cities would follow. Memphis also progressed from river water to wells, and some cities would do the opposite of this, New Orleans being limited to river water only.

A key component in any city's public infrastructure construction is its guiding champion. From wherever an idea for a project springs, it takes one person to devote the energy to guide it toward reality. Sometimes that person is primarily an investor, as was T. J. Latham who reorganized the Memphis Water Company, or an entrepreneur like Richard C. Graves, who expanded one successfully dug well into the Memphis Artesian Water Company and from this acquired control over the city's private water supply.

Another city with which New Orleans's experience can be compared is New York, which, with New Orleans, was one of the five largest cities in the country in the early nineteenth century, and also, like New Orleans, had been an important port in the colonial era. New Orleans had no water system, other than shallow wells and river water vendors, until after the Louisiana Purchase in 1803. New York struggled with unsatisfactory wells and springs before reaching its final decision to build the great Croton Aqueduct in the 1840s to bring fresh water from miles away. The project involved a private company that eventually became a great bank, and city and state efforts that, with the use of the best current technology, satisfied the city's needs at a cost the government and citizens could bear.

In New Orleans the struggle to build a water infrastructure took far longer -- until the early twentieth century -- but the city's problems, although different from those of New York, fit into the same categories: geological, human, technological, and financial. Both New York and New Orleans would ultimately be forced to improve their water supplies for the same reason: fear of disease. Filth, swamps and odiferous bad air (from whence the name "mal-aria" comes) were blamed for epidemics before proof was available as to the cause of the spread of disease. Epidemics, such as the 1830s cholera scourges that swept New York, were automatically followed by civic outcries for a good water supply. But, having the resolve to demand good water was not always tantamount to securing it, as residents of both cities discovered.²⁸

When victims of the cholera epidemic in 1831 plaintively cried for cold water, New York City had little to offer them. The city depended upon wells, springs, and a reservoir, none of which were satisfactory. The best known early Manhattan water source was the "tea water pump," so called because one could brew tea with its pure water. By the 1830s this was a distant

memory, the pump having succumbed to pollution from nearby tanneries and sewage at its lower midtown location.

New York's main problem with water was local politics. The well-connected Aaron Burr had spearheaded formation of the Manhattan Water Company in the late eighteenth century.

Presumably, this company existed to provide water for the city in return for a franchise on water sales. This method of securing a city's water was often used, in fact, New Orleans first water system was built in this way. However, Burr had managed to have the legislation setting up his company so worded that the corporation had the status of a bank. Water supply was definitely secondary to financial speculation in the Manhattan Company. In fact, the company would evolve into the Chase Manhattan Bank long after the city had litigated away its water monopoly. In 1831, however, the Manhattan Company still had the franchise and was providing only minimal water service at high cost. Other private water companies made appearances, drilled wells, and all failed to solve the problem of supplying drinking water, although by 1831 a government supported well and tank at Thirteenth Street provided help for fire protection. It had been proven that private companies were not the solution. The government would take on the burden of supplying New York with water, and take the beginning steps toward bringing water from far off rivers by aqueduct to Manhattan.²⁹

New York and New Orleans were also similar in that they both were port cities and both had rivers at their edge. New Orleans, unlike New York, had a plentiful fresh, not brackish, water supply in its river water, although the sediment was thick. Manhattan was on more solid footing and had, in its very early days, shallow wells, ponds, and small streams. As the city grew, the ponds and streams were filled, and wells needed to be dug to deeper depths. Both New York and New Orleans had been colonial cities, and both had switched from one European

country's control to another's (from French to Spanish, in New Orleans; from Dutch to English, in New York) but by the early nineteenth century both were part of the United States. The Dutch began an infrastructure of wells and pumps in Manhattan, which the English did little to better and the Americans were ineffectual in improving since the impetus for water infrastructure work was circumvented into financial shenanigans by the Manhattan Company. Colonial rulers of New Orleans did nothing to improve the water supply.³⁰

After the Louisiana Purchase, New Orleans's first water system had been constructed by Benjamin Latrobe, best known as an architect of the United States Capitol but also responsible for the first Philadelphia water system. In Latrobe's work, simple steam pumps drew water directly from a river to pipe through wooden pipes along the streets. In neither New Orleans nor Philadelphia would this system prove effective. The one that replaced it in Philadelphia, the Fairmount Waterworks, dammed the Schuylkill River and used water power to raise the level to a storage height for pipe-filling pressure. This 1830s work was the first modern urban water system in the country, and as such was a spur to New York's efforts to seek a similar source.³¹

Another similarity between New York and New Orleans in their need for dependable water service was the danger of fire. New Orleans had major conflagrations in 1788 and 1794. New York also had fires, and in 1835 some seven hundred buildings were destroyed in a late December inferno made worse by the fact that the few wells and the 13th Street Reservoir were woefully inadequate. Even a marble statue of Alexander Hamilton in the Merchants' Exchange building was destroyed, "for which the living Hamilton earned a share of the blame" for his role in the ineffectual Manhattan Company.³²

New York was the largest city in the United States in the early nineteenth century. New Orleans, by 1830, was in fifth place, behind Philadelphia, Baltimore and Boston. As the only

major city not on the East Coast, New Orleans was somewhat isolated from quick transfer of technical knowledge, although its port status meant that communication with the city was as swift, if not swifter, than that to inland locations anywhere else in the country. New Orleans's population moreover, was decidedly diverse. Besides containing a large number of non-English speakers, the citizenry included numerous African-Americans, both slaves and free people of color, the majority of whom were in lower income ranges and thus less able to help pay for civic improvements. Clearly it was difficult to achieve consensus from such a mix of viewpoints, and citizens were also perhaps not united in their ideas of what constituted a proper city water infrastructure and whether one was needed at all. These factors, coupled with New Orleans's difficult geological problems, would hinder the city in its early efforts toward a water system. New York, on the other hand, was well connected to other urban centers, had a large community of businessmen and financiers who could well afford to pay for improvements, and had an active press and vocal electorate who began demanding a better infrastructure.³³

The idea for bringing water south to Manhattan from the Croton River began in the early 1830s. Competing plans for Manhattan's water system were gradually being proved inadequate, and Myndart Van Schaick, a liberal Democrat who served as a city alderman and as a state senator, championed the Croton as a source. In the early 1830s cholera outbreaks pushed the city to action, and Van Schaick, on the Board of Aldermen's water committee, hired an engineer, DeWitt Clinton, Jr., to ascertain the feasibility of the city's using the Croton. The report was glowing, if some of its engineering conclusions were useless..³⁴

Van Schaick, as a newly elected state legislator, was able to construct a novel system of overseeing construction of the Croton project: a commission, set up on the state level, would be appointed by the governor, at that time a Democrat. Chairing the commission would be Stephen

Allen, a self-made millionaire and also a Democrat, but not known for diplomacy. Allen and Van Schaick would be leading figures in the project. The problems inherent in the conflict between a state government and that of the state's largest city would be found in Louisiana as well as in New York.³⁵

In Louisiana in the 1830's the state-chartered Commercial Bank was set up to build a waterworks for New Orleans. A large reservoir was constructed and street piping laid in addition to the old Latrobe system. This would have been equivalent to the 13th Street Reservoir the city of New York built at the same period. Neither offered filtered or purified water and neither guaranteed an ample supply at useful pressure. The New Orleans bank's franchise ended in 1869, the city operated the system until 1877, and then the state named another private company, the New Orleans Waterworks Company, as franchisee, this one improving the old reservoir and system but offering mostly unsatisfactory service until, after much litigation, the New Orleans Sewerage and Water Board system came on line past the turn of the century.³⁶

In Manhattan in 1832 the engineer hired to begin the Croton Aqueduct project was David Bates Douglass. Douglass had received engineering education at Yale University and at the U.S. Army Academy at West Point. His work was adequate, he plotted out the route the aqueduct would take to bring the water from the Croton to holding tanks in the city, and he proceeded slowly. He also did not get along with Allen -- this would prove his undoing. Douglass's opinions were also called into question. The commissioners called upon Albert Stein, the Prussian-born engineer who oversaw and built the 1835 New Orleans reservoir project, for his opinion on the efficacy of using the Croton River rather than the closer Bronx River. Stein agreed with Douglass that the Croton was preferable and his report calculated the Croton's capacity (and the commission believed Stein's figures.)³⁷

Elected officials might make the decisions on which projects to choose, but the work of carrying out the project would be a job for professionals, trained by apprenticeship or schooling in the engineering skills necessary to complete the projects. John Jervis, who replaced the unlucky Douglass on the Croton job, had on-the-job training on the Erie Canal. Douglass, with his military background, was similar to Stein, who had Army engineering service in Prussia before coming to America. Stein would also work on the New Basin Canal in New Orleans before moving to the waterworks of Mobile, Alabama. The nineteenth century was a period in which the profession of engineering was assuming its modern guise: its practitioners moved from project to project and new technological breakthroughs spread widely. Jervis readily tried new ideas throughout the Croton project. When the New Orleans Sewerage and Water Board system finally came into being it would be with the contributions of two extremely talented engineers, George Earl, who proved Mississippi River water could be easily purified, and Baldwin Wood, who supplemented his academic training with practical experience and a knack for innovation in his pump design.³⁸

The Croton project, to be overseen by a state appointed board, still had to be funded. The method would include bonds, to be sold by the city of New York, and rates, to be paid by water users. The city's voters would have to approve the project. Although there was great trepidation on the part of the water commissioners as to the vote's outcome, victory was decisive: the only areas voting against it were the poorest ward and the only section with adequate water service already.³⁹

In New Orleans in the 1880s, when the private company holding the franchise was woefully inadequate, voting results would be different. The problem was one of financial stability: New York had a vibrant economy, a solid tax base, and, on average, a citizenry able to

absorb the cost of service. New Orleans, an occupied city for most of the Civil War, with its port and economy in shambles afterwards, and carrying the legacy of a spendthrift Reconstruction administration, by the 1880s had a paltry tax base, a poor electorate, and a city debt that was staggering.⁴⁰

Even the yellow fever epidemic of 1878 could not persuade the New Orleans voters to approve the spending needed to improve the infrastructure of the city. Elections in 1889 offered bond issues to the public that went down to resounding defeat. The state also refused to aid the city. The growing awareness that the city desperately needed infrastructure improvement could not overcome the obstacles of the inability of both the citizens, and their already indebted government, to pay the costs. Although there were cries that machine political bosses were to blame, credence should be given to the economic conditions then prevailing.⁴¹

It was most likely those same economic conditions, with the additional burden of its soggy terrain and bowl-shaped location coupled with the effect of being on the losing side in the Civil War, that put New Orleans half a century behind New York in getting an adequate water supply. Although the Croton Aqueduct project certainly involved intricate engineering problems, and the attendant legal and political difficulties of land acquisition and long-term funding and management, it appears that it was not New Orleans's lack of technical expertise nor the ability of its political establishment, but more the fault of the financial situation of New York that enabled the city to accomplish so much, and so much sooner than New Orleans. New York, for example, apparently weathered the Panic (depression) of 1837 with greater ease than New Orleans.

And yet, both cities were locales where clever men could enrich themselves at the public expense. In New Orleans, Walter Van Benthuyzen grew wealthy from owning and running

street railroads; in New York. George Law would parlay his Croton engineering contracts into a huge fortune. But, in New Orleans, Van Benthuisen's greed was great enough to have a bad effect on city services when his franchise did not perform as expected, while in New York, George Law's enrichment could be accommodated without harmful results to the water supply. Perhaps it was simply that Van Benthuisen's performance was poor and Law's was adequate -- but it is possible that it is a matter of scale: New Orleans's infrastructure might have been so fragile that any inadequate service was exceedingly harmful, while in New York a strong network of inter-related services could absorb graft and inadequacies in some areas without harm to the entire system.⁴²

One signal achievement of the New York Croton Aqueduct was that it managed to transcend politics. When a conservative Whig administration took office, the personnel on the water commission changed and some slight design alterations were made, but the project continued as before. The idea that Whigs would be backing the inherently progressive notion of the Croton Aqueduct may have been unthinkable earlier, and although the creation of a city bureaucracy to oversee the waterworks rather than leave it in state hands was a Whig decision, the successful provision of city services was something that all political factions presumably wanted. In New Orleans, the final completion of a modern water system, a Progressive era project, came under the administration of Mayor Martin Behrman, predominantly considered a machine politician.⁴³

In 1896, the Louisiana Legislature created a drainage board for the city of New Orleans. There had been some prior interest in a comprehensive drainage plan but no money for it. In 1899, the city voted to adopt a tax for developing a water and sewage system, and the legislature affirmed creation of a board for this purpose. In 1900, the public passed another bond issue for

the projects. Spurring on the public interest was the Municipal Improvement Association, a vocal group of progressive reformers and restive businessmen, tired of their city being victimized by regular yellow fever epidemics with the resultant bad publicity.

George Earl, superintendent of the new Sewerage and Water Board successfully proved that Mississippi River water could be purified. Construction began on the massive canals, pipelines, lift stations and water purification plant projects, and in 1902 the previously separate drainage segment was put into the Sewerage and Water Board. Innovative lift pumps designed by staff engineer Baldwin Wood not only drained New Orleans but would see extensive use in the Netherlands.⁴⁴

The Sewerage and Water Board, with its board seats allocated to citizens from neighborhoods across the city, along with council members and a representative of the Board of Liquidation of the City Debt (a fiscal watchdog), remained insulated from politics. Its work was considered so important that even that consummate machine politician, Martin Behrman, elected Mayor in 1904, would have only praise for it, and in fact, presented an address on "A History of Three Great Utilities" at a 1914 meeting of the League of American Municipalities, a group whose philosophy could only be described as anti-machine Progressive.⁴⁵

Finally, sixty years later, New Orleans had equaled New York in having pure water. And yet, in many ways the stories were similar: once the need was acknowledged, the facts of geology faced and a water source found, the politicians and the people, together, had to agree upon a way to pay for the technical professionals to bring the project to fruition. Just as Houston and Memphis in the South struggled with their water infrastructure, New York, the largest city in the country, had no easy path to pure water and a viable water system. New Orleans in its fight for, and with, water simply follows the course taken by other urban centers – the differences in

its story of those that bear on its special site and situation and the complexities of its people and those in power over them.

End Notes

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³ Bennett W. Wall, Ed., Louisiana: A History, Fourth Edition, (Wheeling, Ill.: Harlan Davidson, Inc., 2002.)

⁴ Craig E. Colten, An Unnatural Metropolis: Wrestling New Orleans From Nature, Baton Rouge: L.S.U. Press, 2005. 1-47; Craig E. Colten, Ed., Transforming New Orleans and Its Environs: Centuries of Change (Pittsburgh: University of Pittsburgh Press, 2000), 1-6.

⁵ M. Christine Boyer, Dreaming the Rational City: The Myth of American City Planning. (London: The MIT Press, 1983), 268.

⁶ Josef W. Konvitz, The Urban Millennium: The City-Building Process from the Early Middle Ages to the Present. (Carbondale, Ill.: Southern Illinois University Press, 1983), xvi

⁷ Konvitz, 49, 74

⁸ Konvitz, 50, 80

⁹ Konvitz, 96

¹⁰ Boyer, ix

¹¹ Konvitz, 131, 133; Boyer, 129

¹² David C. Perry, ed. Building the Public City: The Politics, Governance, and Finance of Public Infrastructure. (London: Sage Publications, Urban Affairs Review 43, 1995,) 1-10

¹³ Perry, 19

¹⁴ Joel A. Tarr and Gabriel Dupuy, ed. Technology and the Rise of the Networked City in Europe and America. (Philadelphia: Temple University Press, 1988,) 13

¹⁵ Martin V. Melosi, The Sanitary City: Urban Infrastructure in America From Colonial Times to the Present, (Baltimore: The Johns Hopkins University Press, 2000), 72-99; Boyer, 58

¹⁶ Tarr and Dupuy, 101. 103

¹⁷ Tarr and Dupuy, 159, 165, 177; Melosi, 151.

¹⁸ Arsen, David “Is There Really an Infrastructure/Economic Development Link?”, Richard D. Bingham and Robert Mier, editors, Dilemmas of Urban Economic Development: Issues in Theory and Practice. Urban Affairs Annual Reviews 47, (London: Sage Publications, 1997) 85, 89

¹⁹ With all these divergent factors involved, there is limited literature on waterworks history. Suellen M. Hoy and Michael C. Robinson, editors and compilers, Public Works History in the United States: A Guide to the Literature, (Nashville: The American Association for State and Local History, 1982.) has 23 pages of descriptions of articles and books covering community water supply topics ranging from monographs on minute points of construction to overall studies ranging over time. The standard one-volume narrative history of water supply, focusing mainly on technical aspects, is M. N. Baker, The Quest for Pure Water: The History of Water Purification From the Earliest Records to the Twentieth Century, (New York: American Waterworks Association, 1948). A good, general work on urban infrastructure in America is Martin V. Melosi’s The Sanitary City: Urban Infrastructure in America from Colonial Times to the Present. (Baltimore: Johns Hopkins University Press, 2000). Most waterworks histories are confined to a city or a region. However, in the field of environmental history, waterworks are covered not simply as an appendage of a political entity, but as a part of an eco-system. In fact, waterworks are to be considered not just part of a system in nature, but as part of a complex political, economic and technological framework that environmental historians acknowledge, and that the city or regionally based histories take into account.

²⁰ Harold L. Platt. City Building in the New South: The Growth of Public Services in Houston, Texas, 1830-1910. (Philadelphia: Temple University Press, 1983), xvii

²¹ Platt, 144, 179

²² Platt, 208

²³ Platt, xv

²⁴ Sorrels, William Wright. Memphis` Greatest Debate: A Question of Water, (Memphis: Memphis State University Press, 1970), 1, 15.

²⁵ Sorrels, 38-9

²⁶ Sorrels, 56, 66, 76, 102

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- 27 Sorrels, 102
- 28 Gerard T. Koeppel, Water for Gotham, (Princeton: Princeton University Press, 2000). p1-6.; Robert L. Dupont "Progressive Civic Development and Political Conflict: Regular Democrats and Reformers in New Orleans, 1896-1912." Ph.D. Diss., Louisiana State University, Baton Rouge, 1999. 204 ff.
- 29 Koeppel, 75-138
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Chapter 1. Trickle By Trickle, 1789 – 1802

In the 16th and 17th centuries, Spain had colonized and was governing an immense American empire that stretched from the Andes to the Rockies. In the second half of the 18th century, when that empire was beginning its long process of collapse, Spain assumed control of Louisiana. Thus, the city of New Orleans would come under Spanish rule at a period that included not only the twilight of Spain's American empire but also the dawn of the age of enlightenment, when scientific progress and revolutionary rhetoric flowered. This period also encompassed the beginnings of modern city building in what would be the United States.

Spain gained the Louisiana Territory, including the “Isle of Orleans,” New Orleans, in a complicated land swap in the 1760s, at the end of the French and Indian War, as termed in the American colonies, or the Seven Years War, as it was known in Europe. England defeated France in Canada, and in 1760 Canada, and its territories, became part of England. One result of this would be the expulsion of French peasants that led to the great Acadian Diaspora and eventual settlement of Cajuns, as they came to be known, in Louisiana. However, England also lay claim to Spanish possessions in Florida, and to Cuba. Spain was loathe to give up Cuba. In a land transfer, France managed to get Spain (ruling families of both countries were Bourbon) to hold on to Cuba, but to take over Louisiana – the British happily acquiesced since this left Spain with the cost of holding the frontier and took France completely out of the game. And, in the later decades of the 18th century when the American Revolution raged on the Atlantic seaboard, Louisiana’s Spanish Governor Bernardo de Galvez took the American side, went on the attack to enlarge his territory, and by 1783 British West Florida was in Spanish hands.¹

The cities of the young United States (one of which would be New Orleans after the 1803 Louisiana Purchase) all faced similar problems. Building on what structures had emerged from the first day of settlement, each city confronted the necessity of planning, constructing, financing and maintaining infrastructure that would enable its inhabitants to prosper in as safe and healthy an atmosphere as possible. The major cities of the United States in the early nineteenth century included New York, Boston, Philadelphia and New Orleans. Although all of those cities had originally been under the control of a European power (for New Orleans, France; for Boston and Philadelphia, England; and for New York, the Netherlands, and then England) New Orleans was the last of these to emerge from under European colonial rule. Of those major cities, New Orleans was the only one ever ruled by Spain, or by France.

Calling New Orleans the “Isle of Orleans” is suggestive of one facet of the city that remains today: in many ways, New Orleans is an island. Its insularity is not only physical, isolated as it was in early years between a river and a lake, miles from any other land suitable for settlement. New Orleans retains a cultural insularity, it is a metropolis in the wilderness, a port city with cosmopolitan connections but tied as the entrepot to rural hinterland surrounding it. When it came into Spanish possession, it held fiercely to its French antecedents, and, indeed, repelled the first Spaniard sent to govern it, the unfortunate Antonio de Ulloa, sent packing by rebellious colonists, who was followed by the armed and determined Alejandro O’Reilly who punished those fomenting the rebellion and enforced Spanish rule in 1769.²

The New Orleans settlement the Spanish assumed was subtropical in climate: in the early years orange trees grew readily, sugar cane would be capable of effective production, and even if hurricanes punctuated the calendar the weather was mild, if wet. The town consisted of a rectangle of streets surrounding a square, the Plaza de Armas, on the river, with the church and

government buildings facing the square and the public market on the river side. The land along the river, where a natural levee had been augmented with additional earthen dikes, began to slope gently downward north toward the shores of Lake Pontchartrain. Between the river and the lake other natural levees marked the prior courses of the river, and provided high ground for foot trails: the Metairie Ridge toward the West, and the Gentilly Ridge moving toward the east.³

The effect of these ridges was to create a bowl. The natural drainage of land near the river would run toward the lake, However, the Metairie and Gentilly ridges, at a height of about seven feet, kept the water from draining out. The curve of the river on which the city sat (giving the nickname the “Crescent City”) further enclosed the bowl. Between the ridges and the lake was a cypress swamp, low-lying and becoming marshland on the lakeshore. The soil under this swamp was made of fine river sediment and decaying vegetation. Before urbanization, natural overflow had added substance to these soils as had the attrition of swamp plants. Without that regular contribution, the soils followed a tendency to subside as their contents compacted. Any efforts at drainage would further reduced the water level and the height of the land, thus setting up a subsidence and sinkage process that continues to the present. In the time of Spanish domination the cypress swamps between the city and the lake were still supplying timber, and the ridges were being settled and used as farmland.⁴

In areas surrounding the city, the Spanish inherited the French pattern of granting land concessions that fronted on the river, and ran back toward the swampy lakeshore. As a consequence of this pattern of settlement, drainage canals and roads tended to follow the outline of the early grants. The area near the river was cleared, protected by levees, and held home sites. The back areas were either used for farmland or pasture, and timber was cut from the swamps. Although the early plantations on these land grants supplied needed foodstuffs and export goods

for the growing city, as the city expanded, these lands became part of the built city itself and the original concessions were subdivided into lots. The tangled streets of the uptown section of the city today reflect these early boundaries, which are also marked by (now underground) drainage canals along their borders.⁵

Although the greatest flooding threat came from the river, where a crevasse – a break through the levee – could inundate the land, even torrential rains and hurricanes could flood the penned in area behind the settlement for months. For any drainage from the 18th century settled areas near the river, the one outlet toward Lake Pontchartrain was Bayou St. John, a sluggish stream that ended less than a mile from the river bank. The bayou, a short canoe portage route distant from the back of the city, also provided an important trade link. Boat traffic on Bayou St. John could reach the Gulf Coast via the Rigolets and Lake Borgne, or could traverse river routes north of the lake into the inland South. Since Spain was bent on controlling and profiting from trade, Carondelet had ample reason to want to commit to improving access to the Bayou St. John trade route – besides, there was some revenue to be gained from boats using the stream, and there might be concomitant drainage improvement. Thus the building of what would be called the Carondelet Canal, was justified. From a turning basin (where Basin Street is now located, one block from the edge of the original city on Rampart Street) the canal could bring shallow draft craft to Bayou St. John and on to Lake Pontchartrain, and hopefully carry rainwater along the route.⁶

Even if New Orleans's water infrastructure -- the dependable water supply, drainage system and flood protection -- was, by most accounts, primitive, there was still a system in place. That can be taken for granted because of the very nature of a city's need for water infrastructure. Water infrastructure is vital to a city. Cities, and their inhabitants, need water for drinking, for

brewing beer, for food preparation, for bathing, for street cleaning -- a necessity in the day of the horse -- and most importantly, for fighting fires. The building of a water infrastructure for a city involves several key factors. There must be some sort of technology involved, even if it is primitive. Some way must be found to pay for the work: there is financial responsibility somewhere. Who makes the decisions on projects, financing and maintenance? Are elected or appointed officials involved, and is the public involved in decision-making? Who will carry out the work? Is technical expertise necessary for this person or persons?⁷

An inquiry into the history of New Orleans's water infrastructure of the Spanish period must account for those factors particular to Spanish governance. To begin answering those questions for Spanish New Orleans also requires consideration of how Spanish experience had already dealt with such things in the colonial era. When Spain was first profiting from precious metal production in the colonies, the country was in the forefront of metallurgical technology. The process of refining silver, for example, was adapted from small scale operations in Europe but put into grand scale usage in Mexico. Presumably, the fact that the Spanish had large-scale mining operations in the 16th and 17th centuries meant that by experience they had moved to the forefront of contemporary mining technology. From the fact that Spain was at war for a large portion of the 16th, 17th and 18th centuries it can be deduced that they had technological knowledge of fortification construction.⁸

The Spanish had knowledge of direct water technology through dealing with irrigation systems, including intricate ones in Spain that had been built by first their Roman rulers, and then by North African conquerors who brought their knowledge of desert conservation of water resources. Spain had brought its water knowledge to its colonial empire. New Orleans, being surrounded by water and with ample rainfall, had none of the water problems of arid regions, or

indeed of semi-arid places such as Puebla, Mexico. In Puebla the use and availability of water was not only a matter of economics, but of social control and group dominance as Indian groups gradually lost their water access. On the northern frontier of Spanish America, aridity was more common than in the swampy morass of Florida, for example. Thus, when dealing with water, the Spanish were more likely to have learned ways to handle a sparse supply.⁹

What is now Mexico City was an area of intense drainage work under Spanish domination – the Spanish drained the swampy area and constructed a larger city than the settlement that had been on the site. But when it came to the drainage problems of New Orleans – the rear of the city was mostly swampland – the Spanish did nothing. Had Spain slipped from the forefront of technical know-how at the time of its 16th century silver industry to linger far behind other European nations in welcoming the industrial revolution? As far as New Orleans was concerned, Spain applied little modern technology to solve the city's water problems. Knowledge of metallurgy contributes little to a water system, but mining and military construction experience can predict expertise in water infrastructure. Projects that require moving earth and supporting earthworks require the same skills as canal building or marsh filling, and the Spanish had proved their expertise in Mexico. Although in-town levee construction and maintenance (both involving earth moving) required constant attention by the Spanish in New Orleans, the major water project completed under Spain was Carondelet's canal linking Bayou St. John, an outlet of Lake Pontchartrain, with the rear of the city, along with creation of a turning basin, in 1796-97. Although it served some slight purpose in drainage for the city, this canal was primarily intended as a navigation aid.¹⁰

Carondelet served from 1791 to 1797. He was not much loved by the populace (who mimicked his name as *cochon-du-lait*, "piggy") and he seems to have been a conservative or

reactionary politician with little flexibility and no knack for dealing with Louisiana questions. Carondelet, like the rest of the Spanish governors, came from the military. Frantic with worry over American or British encroachment of his borders and beset with revolutionary sentiments among the populace, Carondelet immediately began building fortifications, " a task at which he was a skillful, if somewhat self-styled, engineer."¹¹

Carondelet built a palisade wall around the three land-facing sides of the city, and added five redoubts (for artillery placement.) His work also improved the ditch on the city's outer perimeter, along with ditches running from the river, that served as primitive drains. As the other Spanish governors had, Carondelet, besides the need for maintaining the allegiance of his populace, gave priority to border protection and relations with surrounding peoples. Trade, and then at least a subsistence lifestyle for the residents (hopefully to be increased with Catholic immigrants) were his next concerns. It was partially to facilitate access by water to the Spanish settlements on the Gulf of Mexico that Carondelet conceived his canal project. The canal also was conducive to inland trade, and did provide some drainage.¹²

Neither Carondelet, nor any of the other governors availed themselves of new technology that might have helped them deal with the water problems of the city, both in drainage and supply. Steam engines were already used in England for mine draining and James Watt's steam patents dated to 1763, but such engines apparently were not considered for the New Orleans water system. The Spanish territory could, and did, welcome some technology. Carondelet encouraged the building of flour mills (probably water-powered.) The first cotton gin arrived in Natchez during Bernardo de Galvez's governorship in 1795 there and immediately gins were built in numbers and cotton assumed major importance as a crop. The rapid proliferation of cotton gin technology – which, after all, promised a speedy return on investments – proves that

even the Spanish borderlands, when they wished to do so, could absorb new technical knowledge and apply it.¹³

Perhaps the difference in adopting technology for private rather than public purposes had to do with finance. The Louisiana colony was not completely self-supporting, in fact it relied on funding from Spain. What revenue stream the city of New Orleans could supply was little: a chimney tax to pay for a street lighting system was never fully collected, for example. Tax on trade goods or custom levies were wildly unpopular and governors would fluctuate on what fees they might impose at any given time. At the same time, Spain was never generous in funding the colony and the records show constant complaints about insufficient, late, or nonexistent payments. The Spanish regime seemed to place the onus for infrastructure creation and maintenance on landowners, where possible. Owners of land along the river, for example, were expected to keep up their section of levee maintained to a set height. In one fire-prevention scheme all property owners were supposed to dig a well.¹⁴

At the same time that Spain maintained control over moneys for the colony, New Orleans residents had only limited control over expenditures. New Orleans had a Cabildo, a form of local government found in other Spanish colonial cities, but the Cabildo, in practice, was limited in what it could expend, even though the New Orleans Cabildo was stronger than most of its counterparts. Although those who served as members of the Cabildo might represent various districts, positions were sold. The Cabildo functioned in some ways as a court (members served as judges,) it had some control over ordinances and some fees, it set prices for foodstuffs, issued market and trade regulations, paid for ceremonial functions and accoutrements, and handled some public funding and tax collecting.

Even while the Cabildo was in existence, the Governor retained power as the representative of the Spanish government. The Bourbon reforms of Spain, especially the pattern of governance of colonies associated with the "Prince of Peace" Manuel de Godoy that took much from the centralized-bureaucratic system of France, were in effect for much of the time that New Orleans was Spanish. The "intendant", a treasury officer with control over trade, revenue, municipal and military expense, was totally separate from the governor for the last years of Spanish rule. With these different layers of governance over moneys -- the governor, the intendant and the Cabildo -- it became increasingly difficult to run the city smoothly. Although New Orleans, compared to other towns in Spanish North America, was relatively well off, there was not enough funding for large projects, such as a more ambitious water infrastructure, and no public sentiment to tax any more than minimally.¹⁵

Besides levee concerns and Carondelet's large canal project, the biggest factor in what little water infrastructure creation took place was fire. The two greatest disasters during the period of Spanish domination of New Orleans were the fires of 1788 and 1794. Even though the city was plagued with hurricanes and the usual seasonal epidemic diseases, the fires were remarkable for the upheaval they brought to the entire community. Both fires, ironically, took place on religious feast days, and the first, on Good Friday, March 21, 1788, was purportedly started by altar candles at the home of the military treasurer, Don Vicente José Nunez.¹⁶

Governor Esteban Miro and Intendant Martin Navarro reported to Spain that the 1788 fire began at half past one in the afternoon, "reducing to ashes 865 buildings, comprising all the business houses and homes of the principal citizens of the city." A violent wind from the south wind kept the fire raging, until even the church had burned and there was barely enough time to save the inmates before the jail was consumed. Buildings on the river had the best chance of

survival, and so some of the warehoused goods were saved, but the populace was desperate and Governor Miro had to issue rations of rice and set up tents to house the homeless. Miro commented that he knew not “whether we felt greater fear upon seeing the city in flames, or in the knowledge of the pitiful situation in which all its inhabitants were included.” The estimated damage was set at 2,595,561 pesos.¹⁷

Besides the care for the refugees, Miro’s concern was for the economy – a few restrictions that had been lifted on trade were kept off, and both private and government rebuilding funds and supplies were sought.

The 1794 fire was even more disastrous for the colony. Governor Carondelet wrote to Godoy that “a third of the richest part of the city was reduced to ashes.” The fire began on December 8, what would be the Feast of the Immaculate Conception, when children playing in the Royal Street courtyard of Francois Mayronne lit a fire that ignited some hay stored nearby. A north wind blew strongly and spread the blaze until 212 buildings had been consumed. “The losses of the merchants were immense,” Carondelet recorded. This fire was even more financially disastrous than the 1788 one. Just as Hurricane Katrina’s victims suffered the loss of their neighborhoods, so did Orleanians of the Spanish era have to cope with destruction of the city they loved. As in the modern era, the political repercussions of disaster were in the minds of the leaders. Added to the governor’s worries were his fears that the enemies of Spain would take advantage of the disaster, seeing the “crushed spirits of these people” who were reeling from two hurricanes and a fire in less than five months time. Arrival of his foes at the mouth of the river might even “cause an uprising in the Province,” Carondelet warned the Spanish court.¹⁸

Carondelet’s reaction was tempered by his knowledge that there was an active effort by French Republican supporters and by land-hungry Americans to undermine Spanish rule in

Louisiana, either by circulating inflammatory literature or by carrying on illicit trade and setting up residence in Spanish territory. He begged for Spanish government assistance, speedy payment of moneys due the colony, permission to float a bond issue for reconstruction, and extra funding for economic and physical improvements.¹⁹

Carondelet's actions after the fire were, no doubt, governed in part by his justified paranoia about enemy invasion. But his obvious concern for the welfare of the citizens was shown by his attention to details on how the city could be made a better place to live. Carondelet addressed infrastructure needs. He advocated adding a chimney tax for fire protection cost, and adding two policemen to the force to add protection against arsonists. He promoted the government's paying for pumps, buckets and axes, and for the hiring of bricklayers to inspect chimneys. And, predictably, he advocated replacement of wooden shingles with tiles. The idea that changing building codes to promote fire prevention by elimination of flammable wooden structures was a standard reaction to urban fires. Carondelet went so far as to ask the Spanish government for funding to give 500 peso grants to New Orleanians to help them improve and fireproof their rebuilt dwellings.²⁰

From the earliest years of Spanish domination the Cabildo had been concerned with fire prevention: chimney inspections began in 1770 and a fine was assessed for dirty chimneys in 1775. Governor Luis de Unzaga issued edicts in 1771 requiring citizens to keep fire-fighting equipment (ladders, buckets, axes, etc.) on hand and be ready to volunteer to combat blazes. More chimney regulations were added. The Cabildo bought pumps and buckets, and for the remainder of the Spanish era there were regular expenditures for buckets, pumps and ladders purchased with public funds, which also paid for repairs and maintenance.²¹

These pumps, or engines, were never described as being steam driven. They apparently were large enough to each have a separate building or an outdoor setting for storage, and when they broke, it required either a blacksmith or a specialized workman to fix them. The pumps were most likely simple suction devices that created a vacuum by moving a piston up and down in an enclosed chamber, and, most likely, each was attached to a holding container for water. Presumably the pump storage container was to be filled with water by use of buckets -- no mention is made that direct river water could be used. However, it is tempting to speculate that some pumps did use river water, since pumps were certainly stored near the river: Cabildo minutes note that the hurricane of August 18, 1793, badly damaged "the sidewalk on the levee where the market isand certain doors of the [adjacent] building where the fire engines were kept." ²²

As in Puebla, water infrastructure could be governed by class concerns. Location of the fire pumps after 1794 varied. At one point Governor Carondelet took one onto his property, with the rationalization that "it seems to him as convenient to place same in the patio of his Lordship's house ... where it can be easily taken out in case of a fire, with the quickness and promptness required in such cases." By the next month the Cabildo members for each district had the district pumps kept at their homes. Obviously better fire protection went to office holders.²³

Besides pumps, buckets and ladders, fire prevention could be accomplished by building code changes. Tile roofs, flat roofs, limitations on the building of wooden houses: all of these were enacted in New Orleans but do not seem to have been consistently enforced. Even after the 1794, it took a special vote by the Cabildo to remove some temporary huts, one of which had caught fire, which had first been erected to house to homeless after the 1788 blaze. Another problem blamed on the fire was the continuing poor street drainage: badly rebuilt homes were

though to cause this and Bartolomé Lafon was authorized the purchase a level and inspect ditches on lots and building sites and regrade the streets.²⁴ One difference between European and American cities may be the ability of European governments to enforce strict building codes (which, of course, hampers the spread of fire.) American cities, with their independent citizens, were not able to enforce such rulings strictly. Thus, American cities had an earlier and more pressing need for municipal water systems for fire control than their European counterparts. In Spanish New Orleans, apparently, both rules applied: European-based governance instituted the strict building code, American-style independence ignored it.²⁵

Drainage of the city was a problem that the simple ditches of the era did little to assuage. Over-running latrines were a recurrent concern, with the Ursulines' property and the military barracks -- both at the lower end of today's Vieux Carre -- causing concern. There was a proposal to construct a culvert to take the effluent outside the city walls (the lower side of today's Esplanade Avenue) but this would also have had little long-term effect. Even today New Orleans's street drainage still has not been completely addressed.²⁶

Besides information gleaned from official records, first-hand descriptions of the water system of the city under the Spanish are provided by contemporary visitors. Francis Bailly was a 21 year-old Englishman when he came through New Orleans in 1797. Bailly would later gain fame as an astronomer and serve as president of the Royal Astronomical Society. As a gossipy young traveler he exhibited commendable scientific curiosity when faced with New Orleans water:

"The first thing which attracts the attention of a traveler on entering the Mississippi, is the extreme turbidness of its waters. This I had been led to expect, and its appearance answered my expectations; but when I came to try the experiment which has been hackneyed about in all the descriptions of this country, I must confess I was disappointed; viz., 'That in a half-pint tumbler of

this water these had been found a sediment of one inch.' I tried it several times and scarcely ever found it more than one-eighth of an inch, if so much." ²⁷

Fortunately, as Bailly pointed out, the city's most popular table drink was water mixed with wine (claret) or "weak punch which is a favorite liquor in all warm countries."²⁸

Another traveler who commented upon the water was Dr. John Sibley, a native of Massachusetts who later made his home in Louisiana. but first visited in 1802.

"The River Water is used invariably for every purpose, it is taken out above the town and brought in Carts to every House and Sold, when kept in jars and filtered it is Clear, Cool and pleasant as any Water can be and no doubt wholesome [sic.] Many use it as it is taken from the River, but it is not Cool and has a Milkey [sic] appearance."²⁹

Sibley had a chance to taste the filtered water stored in jars (probably large pottery ollas) when his ship anchored below the city and he visited a home there:

"The house we went to was a Frenchman's, twas built of wood, one story high, coarsely done, but the apartments large and airy and clean white washed and appeared to live in plenty, were hospitable and sociable; had Excellent water to drink that was Taken up from the River and kept in Large Jars to Settle and Cool."³⁰

During the Spanish period in New Orleans little was known about disease transmission. However, even if there was no proof, there was obviously scientific speculation. Dr. Sibley noted that topics in a September 27, 1802 conversation with a Mr. Morgan and a Dr. William Flood included " the effect of charcoal in correcting ill qualities in water" and "New Orleans people thought more healthy than Charleston, inferiority of the water one cause of it." (Surely one of the few instances in which New Orleans was judged healthier than any other city!)³¹

Although during Bailly's visit in 1797 the Carondelet canal was not open (and Bayou St. John was full of alligators), by the time of Sibley's arrival the canal was functioning not only as a transportation route but as part of the city's drainage system. As he describes his outing:

"I walked about a mile on the bank of the canal that leads from the back streets of the town near the hospital into Lake Pontchartrain, which is salt water only 1 1/2 mile from the City. Small coasting vessels come from thence through the canal into the town. This canal receives all the water from the town drains

from every street leading into it, the levy [sic] prevents any communication with the river." ³²

Both Sibley and another visitor, William Johnson, remark on house construction.

Johnson, a Philadelphia merchant on a trading venture that took him through New Orleans noted:

"The streets are narrow but regular; the houses have principally flat roofs, and are mostly elegantly built. the whole city is inclosed [sic] in either walls or pickets, at every convenient part of which are iron gates through which all persons or carriages must pass to go in or out of town." ³³

Dr. Sibley also saw the city in a positive light:

"The town is large, regularly lay'd out and well built, many of the houses elegant, cost in building 40 or 50,000 dollars, mostly brick or stone covered with tile and plastered, outside and in the fronts generally painted white and look well and full of people." ³⁴

Apparently New Orleans could appear as a prosperous metropolis. However, the city entered the United States with little or no water infrastructure and would devote much of the nineteenth century to remedying this lack. Admittedly, the other major American cities were little better off (Philadelphia did institute a steam powered river water system prior to 1800 but New York and Boston were relying on wells.)

Beset with financial difficulties and a host of environmental catastrophes, the Spanish struggled as best they could to govern New Orleans. In balance, this ineffective Spanish rule seems to have left the city somewhat at a disadvantage, compared to other cities on the Eastern seaboard of the United States. However, in the following years, Orleanians under American rule would recall fondly the Spanish *laissez-faire* attitude toward tax collection or general meddling in citizens' lives. ³⁵

End Notes

¹ Wall, ed., 57-59

² Wall, ed., 67-75

³ Colten, Unnatural Metropolis, 4-10.

⁴ Colten, An Unnatural Metropolis, 4-6; Milton B. Newton, Jr., Louisiana: A Geographical Portrait, (Baton Rouge: Geoforensics, Second Edition, 1987), 120-125

⁵ Newton, 121.

⁶ Colten, Unnatural Metropolis, 38-39

⁷ Fortunately, the proceedings of Spanish colonial administrators are well recorded. Microfilm of original records is available, at the Historic New Orleans Collection, the Louisiana State Museum Archives, the Archives of the Archdiocese of New Orleans, the Louisiana Collection at the New Orleans Public Library, the Special Collections of the Howard Tilton Library at Tulane University and the Monroe Library at Loyola University.

⁸ David Weber. The Spanish Frontier in North America, (New Haven: Yale University Press, 1992.)

⁹ Sonya Lipsett-Rivera. To Defend Our Water With the Blood of Our Veins: The Struggle for Resources in Colonial Puebla. (Albuquerque: The University of New Mexico Press, 1999

¹⁰ Joseph Dawson, Ed. and Consulting Eds. Mark T. Carleton, Jack D. L. Holmes, Joe Gray Taylor and Joseph G. Tregle, Jr. The Louisiana Governors: From Iberville to Edwards. (Baton Rouge: Louisiana State University Press, 1990), 65; Thomas Marc Fiehrer, "The Baron de Carondelet as Agent of Bourbon Reform : a Study of Spanish Colonial Administration in the Years of the French Revolution." Ph.D. Diss. Tulane University. 1977.

¹¹ Fiehrer, 452; Konvitz, 131.

¹² Fiehrer, 515-584

¹³ Jack D. L. Holmes, Gayoso: The Life of a Spanish Governor in the Mississippi Valley, 1789-1799. (Baton Rouge: Louisiana State University Press for The Louisiana Historical Association, 1965), 99-101; Encyclopedia Britannica, 1960 edition, Vol. 21. s.v. "Steam."

¹⁴ Gilbert C. Din, and John E. Harkins, The New Orleans Cabildo : Colonial Louisiana's First City Government, 1769-1803. (Baton Rouge: Louisiana State University Press, 1996)

¹⁵ Holmes, 217; Din, Cabildo, p 284-298

¹⁶ Charles Gayarré, History of Louisiana: The Spanish Domination, Fourth Edition, Vol 111, (New Orleans Hansel & Bro., Ltd., 1903), 203-4.

¹⁷ "Report of Governor Esteban Miro and Intendant Martin Navarro on the fire which destroyed New Orleans March 21, 1788," Louisiana Historical Society Publications, Vol VIII, p 59-62; Judy Riffel, trans. "New Orleans Fire Victims of 1788 and 1794," La Raconteur, Vol. XVIII, , No. 1, April, 1998, 2-4

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- ¹⁸ Jack D. L. Holmes, "New Orleans in 1794: A Name and Location Guide From Spain," New Orleans Genesis, Vol. XVI, No. 63, June, 1977, p 268-274
- ¹⁹ Gayarré, 337-8, Holmes, New Orleans Genesis, 268-274
- ²⁰ Jack D. L. Holmes, "The 1794 New Orleans Fire: A Case Study in Spanish Noblesse Oblige," Louisiana Studies, Vol. XV, No. 1, Spring, 1976, 21-44
- ²¹ Din, Cabildo, pp 138 ff
- ²² Actas del Cabildo, English translation, meeting of August 20, 1793.
- ²³ Actas del Cabildo, English translation, meetings of September 1, 1797, October 13, 1797
- ²⁴ Actas del Cabildo, English translation, meeting of December 16, 1794, March 5, 1802
- ²⁵ Konvitz; Din; Cabildo.
- ²⁶ Actas del Cabildo, English translation, meetings of August 6, 1790 and June 3, 1791
- ²⁷ Francis Bailly Jack D. L. Holmes, Ed. Journal of a Tour in Unsettled Parts of North America in 1796 and 1797. (London: Baily Brothers, 1856.) Carbondale: Southern Illinois University, 1969). 179
- ²⁸ Bailly, p 171
- ²⁹ Dr. John Sibley. "The Journal of Dr. John Sibley" Louisiana Historical Quarterly Vol.10 (1927) 474-497.
- ³⁰ Sibley, p. 477
- ³¹ Sibley, p 483
- ³² Sibley, p 479
- ³³ William Johnson, "William Johnson's Journal" Louisiana Historical Quarterly Vol. 5 (1922)
- ³⁴ Sibley, p 479
- ³⁵ Fiehrer, p 571

Chapter 2. Pipe Dreams, 1803 - 1822

Had they devoted the same robust energy that propelled the stars and bars above the Place d'Armes at the Louisiana Purchase signing in 1803, the American installed government of New Orleans would have been more effective in providing for improvements to the country's newest city. Tracking one such civic project -- the water-works -- from planning through construction to functioning reality illuminates both the dynamics of how local and national leaders accomplished goals in the early years of the nineteenth century and the methods by which America's early urban infrastructure was financed and constructed. In the early years of the Republic there was an overwhelming national enthusiasm that great accomplishments were possible. At the same time, the new nation was small enough so that personal relationships between those in power could stretch across the miles – and, those relationships were paramount in selection of those who governed and those who built the necessary structures for cities.

After the Louisiana Purchase, the city quickly attracted new residents. Merchants and young men intent on improving their lot arrived, ready to prosper. William C. C. Claiborne, President Thomas Jefferson's personal choice for the territory's governor, looked over the ranks of possible officials and eventually designated a mix of local white Creoles and American newcomers to govern the city, at first under his supervision. Within a decade there was a Chamber of Commerce, a lending library, a protestant church, an English language newspaper, and a city directory. Roads, mail service, wharves and government buildings, town streets, the police, bridges: everything that American eastern seaboard cities would consider as necessary civic amenities became objects of concern. Correspondence between Washington and New Orleans was constant; Claiborne kept Jefferson informed and local officials looked to the federal

system and to Congress for aid and information. Personal acquaintance played a role as well. Jefferson's friendships stretched far, and his choices for posts often went to people he knew. Similarly, personal acquaintance could also be cause for dismissal. Jefferson had gained the presidency when the House of Representatives chose him over Aaron Burr, both having equal electoral votes. Enmity between the two continued. When Aaron Burr was tried as a traitor for a scheme involving western territory then under Spain, his downfall had repercussions when his former friends, including New Orleans Mayor John Watkins, appointed to his position by Claiborne, suddenly found themselves out of favor and out of office. The realities of close-knit country-wide American politics spread across the old colonial landscape of entrenched family connections, purchased local offices and a far-off ruler. Louisiana would absorb the new, but retain vestiges of the old. Dislike of taxation, belief that a government treasury somewhere else should assume costs, the idea that offices could be purchased and should return value to the buyer: such remnants of old practices remained and were easily absorbed into the fabric of the newly American city.¹

One of the obvious needs in the growing city was a reliable water system, yet New Orleans' American government nevertheless proceeded very slowly to fill it. As a project that progressed by fits and starts, that combined poignant tragedy (father and son architects Benjamin and Henry Latrobe died while at work on it) with the best of current science, and with bit parts played by a remarkable number of major American figures (President Thomas Jefferson may even have been one of the first to suggest it), the New Orleans water-works is -- one might say -- not as dry a topic as at first might be suspected.

The water system did bring quick comment at the official local level. After the resignation of French appointee Etienne de Boré, who had been reappointed Mayor by

Claiborne, Mayor James Pitot became the second man to serve in that office. Pitot wrote the City Council on June 29, 1805, noting the need to secure “more healthful water” since the “uncleanliness” of the water “now being drunk everywhere” was “daily becoming more unbearable.” Pitot’s suggestion was that the city use “flat boat timbers” to build a new wharf “which the water wagons might use exclusively.” No other method of procuring water was mentioned.²

And yet, there was another way available for an American city to obtain water. By the year 1800 there were 17 water-works plants in the United States. The earliest were crude affairs with a bored log pipe bringing water from a masonry walled hillside spring to a trough in the center of town. The use of wooden pipe was standard, since cast iron pipe was only technically feasible after 1800 when it came into use in England. Joint connections between the wooden log pipes were made of cast iron, although lead might be used. Since, following the laws of physics, water will seek to reach its own level, the fact that a hillside spring was elevated would give some pressure to the piped water. The next step would be to pump water up to an elevated storage facility from which it would flow into pipes. The first such pump in the United States was a water wheel in Bethlehem, Pennsylvania, built by Moravian settlers in 1755. This raised water from a spring to wooden tanks on a hillside.³

The steam engine provided the next progression in American water-works construction. The early history of the development of the steam engine is largely concerned with pumping water, at first for draining mines, and then for moving water into conduits for distribution. The first steam engines were English, but the technology rapidly passed to America. In simplest form, water is heated, turns to steam and expands, and the force of that expansion can be made to move a piston in a cylinder, and the piston’s movement can be geared to run a wheel. The

earliest practical engine, a steam pump, was patented by Thomas Savery in England in 1698, but it used large amounts of fuel for the work it did. Thomas Newcomb and his assistant John Cawley developed a piston engine that was in use by 1711 for pumping mines. James Watt, with patents beginning in 1763, refined steam engines so that they were not only more efficient as pumps, they were also suitable for wider applications. With the technology available, American water-works, even in the earliest years of the nineteenth century, could be steam driven.⁴

Although New Orleans was surrounded by water and sited on the banks of the Mississippi River, it nevertheless required a water-works in order to have a dependable water supply for street cleaning, fire fighting, and for household use. At the time following the Louisiana Purchase, residents got fresh water from the river for their own use or by purchasing it from vendors, from shallow wells, or from rainwater caught by gutters and stored in cisterns, which began to come into use after slate or tile roofs were required as a fire preventive measure. All these methods of collection produced a silt-filled water which was stored in clay jars and purified by mixing in alum or peach pits or by dripping through porous stone.⁵

A water-works project for New Orleans would not be concerned with drainage, or with sewage disposal, or with household interior water supply. The purpose was simply to route fresh water through a pipe system along the city streets. Street cleaning, so necessary in the era of the horse, could be accomplished by attaching hoses to connecting joints and letting the water wash refuse into the gutters, moving it to the rear of town away from the river. And the connecting joints, or plugs, at street corners could provide a water source for pump-wagon fire machines to supply their hoses. (Even today fire hydrants in New Orleans are often called fire plugs.)⁶

Water was a constant topic for the City Council and Mayor of New Orleans in those early years. Under Mayor John Watkins, the first scientific attempts to solve water problems were

begun. Watkins was an 1805 Claiborne appointee, the first American to hold the post of Mayor, and he concerned himself with the city's infrastructure in a more involved and demanding way than his predecessors had. A native of Virginia, Watkins moved to Kentucky as a youth, and had trained as a physician in Philadelphia with Dr. Benjamin Rush, the most noted American medical authority of the period. Watkins was a first cousin of Henry Clay, and had dabbled in real estate ventures in the trans-Mississippi lands with the controversial Philip Nolan. By the time of the Louisiana Purchase, Watkins was in New Orleans, married to Eulalie Trudeau, daughter of a Louisiana Territorial official. Watkins was appointed to the Board of Health and the City Council by the French, and Claiborne continued his appointment, naming him mayor after Pitot.⁷

Claiborne involved himself in city concerns. After appointing Watkins on July 27, 1805, he sent him a note on August 1 urging him to increase "the insufficient number of our fire engines for a city whose growth is so rapid." Claiborne counseled ordering new engines from "one of our northern cities where this type of mechanism has reached a greater degree of perfection." Watkins, meanwhile, was bothered with drainage around the old fortifications on Esplanade and Rampart Streets. "The stagnant waters . . . must prove injurious to health," he wrote the council. "I have no objections to draining the ditches in the vicinity."⁸

Watkins made an attempt to clarify the city's drainage concerns. Drainage for the area of the old city, the French Quarter, was dependant upon the Carondelet Canal, which ran from near Rampart Street out to Bayou St. John. Because of the topography of the land it was a vain hope that gravity flow would provide adequate drainage. With the Metairie and Gentilly ridges blocking flow toward the lake from the higher land near the river, coupled with the fact that the lake elevation was higher than the land between it and the river, no adequate natural drainage was possible. The Carondelet Canal, by the time of Watkins' administration, had been put under

private ownership of an entity called the Navigation Company and was filling with silt and vegetation. In July of 1806, Watkins notified the City Council that the Navigation Company was proposing ditches be opened on either side of the canal to help with drainage. Watkins was not persuaded both ditches were needed, but suggested the company could dig one itself, and noted “the neglect with which the Carondelet canal has been left for several years.”⁹

Watkins ordered Mansury Pelletier, city surveyor, to “inspect carefully the places, by observing the tracks that the natural drainage of the city must leave.” By August 30, 1806, Pelletier produced a colored map of the city, on which he “traced the old draining ditches . . . just as they were in the time of the French.” Pelletier was frank about his difficulties in planning for drainage, since he had no idea how far the built-up city would expand beyond Rampart Street. He was also well aware of the course natural drainage would take. “The waters will continue their natural flow to their limits near the cypress grove,” Pelletier commented, referring to the swampy area between the city and the Metairie and Gentilly ridges and the lake. Pelletier’s map showed drainage ditches running from Rampart Street toward the lake, continuing the paths of St. Louis and St. Philip Streets and continuing a line between Bienville and Iberville Streets, with a large ditch from St. Peter or Orleans St., and a smaller one from that location running diagonally toward the East. Pelletier suggested other ditches running perpendicular to the old drainage ditches, one parallel with and near Rampart Street, and one further out, probably near where Claiborne Avenue runs today. Drainage would improve the land, including land the city had recently acquired, which then “may be sold very advantageously,” Pelletier remarked. Profit was certainly a good reason for Watkins to concentrate on drainage issues.¹⁰

In 1806 Watkins also focused his attention on providing the city with a water supply. He wrote Julien Poydras, then representing the territory in Congress, and suggested Poydras contact

the man who had constructed a water-works for Philadelphia in 1799, Benjamin Latrobe.

Watkins also drew up a plan for a company to construct the works.¹¹

Philadelphia's water-works used steam engines to pump water from a river, and stored the water in holding tanks before piping it along the street grid. Latrobe was both the architect and engineer for this project.¹²

Latrobe was born in England in 1764. His father was descended from French Huguenots. His mother was an American, from Bethlehem, Pennsylvania. The Latrobe parents were both Moravians, a protestant sect begun in Central Europe but with international congregations and well-regarded schools. Latrobe was educated at a Moravian school in Yorkshire, England, and then at a Moravian school in Germany. An elderly German baron guided his choice of architecture as a profession, and Latrobe's facility in art plus his skill in languages and his European travels made him a cosmopolitan asset to London society when he returned to England in 1784. As he was a "true son of the Enlightenment" according to his biographer, his politics, influenced by the French Revolution, were considered radical, but he was able to publish several books based on his travels, work with the prominent London architect Samuel Pepys Cockerell as his chief draftsman, and have some training by the civil engineer John Smeaton.¹³

Latrobe's first wife Lydia Sellon died in 1793, leaving him with two young children, Henry and Lydia. Her death caused Latrobe to suffer a severe breakdown. He had opened an office as an architect in 1791 in London, but the aftermath of the French Revolution dampened building activity in England and Latrobe's own political views may have kept customers away. In 1795 he left for America, where his mother's family's lands in Pennsylvania gave him hope of prosperity and the political climate might be more to his liking.

Latrobe was immediately accepted in America, his letters of introduction even bringing him a weekend invitation to Mount Vernon to visit President George Washington. And, as he lived in different communities along the Eastern seaboard, Latrobe would become an intimate of other major American figures of the time. His friendship with Thomas Jefferson would result in his being put in charge of design and construction on the United States Capitol building in Washington. As a European trained engineer and architect working in America (in fact, Latrobe was probably the only one at the time), he received a number of major commissions for both building designs and engineering works. His lifetime portfolio of American work included, among other buildings, the Baltimore Roman Catholic Cathedral, the Bank of Pennsylvania in Philadelphia; buildings for Transylvania College, Lexington, Kentucky, and Dickinson College, Carlisle, Pennsylvania; Ashland, the home of Henry Clay in Lexington, Kentucky; and in New Orleans, the central tower of St. Louis Cathedral (replaced in the mid-nineteenth century,) and the Louisiana State Bank, 401 Royal Street. Latrobe also affirmed his ties to American when he married Mary Elizabeth Hazlehurst of Philadelphia. With his two children, and later including their sons, John and Benjamin, and daughter, Julia, they formed a happy family.¹⁴

Latrobe was most important to his adopted country as an agent for the transfer of technology. The Industrial Revolution had transformed England, spawning steam driven factories manned by unskilled laborers and making possible giant infrastructure creations of buildings, bridges, water systems and railroads. It was the imported skills of immigrants like Latrobe, and the knowledge brought home by attentive American travelers, that enabled the United States to develop and improve technologies on its own. Latrobe was more than a gifted dilettante who dabbled in various architectural and engineering projects: he was one of the first professional architects and engineers in America. In England he had been exposed to current

trends in steam engines, canal building, and the classical architectural style popular at the time. Latrobe was also eager to pass on his knowledge. Not only his son, but many others profited from working under Latrobe's direction, and those he taught would maintain high profiles in American engineering in the years to come.¹⁵

When he arrived in America, Latrobe intended to support his family not only by designing buildings and constructing canals and earthworks, but also through his knowledge of machinery, which gave him hopes of profit from manufacturing. When he came to America, he quickly began trying to apply his knowledge for gain. His first manufacturing project was a "rolling mill", to make sheet iron from bars of cast iron. The mill was to be an adjunct of his Philadelphia water works — excess power generated by the steam engines pumping water from the Schuylkill River would be used to pound metal. Sadly for Latrobe, this was also the first American example of how his quest for modernity and faith in technology led him into a financial debacle.¹⁶

By 1800, all American rolling mills were still powered by water. The enterprising American, Nicholas Roosevelt, operated a machine works near Newark, New Jersey. Latrobe had contracted with Roosevelt to build the steam engines for the Philadelphia water works. Roosevelt's chief engineer, James Smallman, was an Englishman who had knowledge of how English rolling mills were constructed. Latrobe's rolling mill would be the first steam powered one in America. The mill was housed at the Philadelphia water works, and was operated by a company in which Latrobe and Roosevelt had shares, along with various changing partners. One partner was a German immigrant to Philadelphia, Eric Bollman, who managed the mill. Bollman's chief problem was the inefficiency and unreliability of the steam engines built by Roosevelt. Latrobe worked feverishly to help the mill prosper, using sheet metal roofing

produced by the mill for the United States Capitol, and even selling roofing to Thomas Jefferson for Monticello. The mill produced a good product, but no profit. Finally, the city of Philadelphia purchased the mill and operating company for \$16,000 in 1806. Latrobe had lost money in the enterprise, but his obvious skills, his faith in technology, and his ability to attract partners and investors from the ranks of energetic and optimistic immigrants and native born Americans, was as evident in this project as it would be in his subsequent ventures, including his New Orleans water works.¹⁷

Latrobe could even count the United States Navy as a believer in his cult of the machine. When Latrobe was appointed engineer to the Navy Department in 1804 he initiated a steam driven complex including a forge, a block mill, and a saw mill at the Washington Navy Yards. James Smallman built the engine in Philadelphia, and Latrobe was able to employ “plenty of good Mechanics” to run the factory. The block mill was especially important in the day of sailing ships since standardized blocks that could accommodate standardized tackle and rope were essential for safety, efficiency, and economy. Thus, Latrobe saw and exploited the need for standardized parts, and was one of the first in America to do so. Other than his fees as Naval engineer, Latrobe saw no profit from the enterprise, and when it was burned by the British in 1813 his loss may have been great, but it was not financial.¹⁸

Latrobe lost money investing in textile milling equipment with a purported inventor, Samuel Blydensburg, who produced no equipment for his fees. Latrobe again involved himself with textile production when hired to set up a steam mill in Steubenville, Ohio. For this successful venture in which he had no financial interest, Latrobe created a 16 horsepower engine for the mill, using two cylinders at right angles to each other — a similar design to one patented in 1813 by Francis Ogden, one of Latrobe’s successors in New Orleans.¹⁹

In the early years of the nineteenth century, those involved in American technology were often known to each other, worked together, or followed each other into pursuits. At times the relationships became even closer. Latrobe's daughter married Nicholas Roosevelt, and even if her parents were initially against the match, the couple had a happy marriage. In the heady climate of the young Republic, when all ventures seemed possible and growth of the nation's economy seemed inevitable, innovators such as Latrobe found support for their ventures and common interests with their scientific peers. Even the War of 1812, with obvious disastrous effects on trade and the economy, was regarded as a passing evil, a mere bump on the highway to riches. The American monetary system, however, was not structured to assure a smooth ride. Bank failures, lack of sources of capital, an ineffective national monetary system: all combined to create an atmosphere in which boom and bust were equally possible. Latrobe suffered not only from his bad judgment, but from the financial climate of his times.

The venture that had the most expensive financial consequences for Latrobe was his involvement, beginning in 1814, in a steamboat manufacturing business with Robert Fulton and Nicholas Roosevelt in Pittsburgh. Latrobe became interested in the venture when the War of 1812 prevented shipping machinery by sea from the eastern seaboard to New Orleans. Roosevelt had made a river trip by steamboat to New Orleans in 1811. During his involvement with the steamboat scheme, Latrobe designed a boat and engine, and even correctly recognized that a shallow draft was necessary for navigating the Ohio and upper rivers in the Mississippi system. With a personal financial loss of \$4,000, and the loss of time from other projects, Latrobe could place most of the blame for his 1817 bankruptcy on the steamboat fiasco. While his interest in river transportation was caused by his involvement with the water works project of New Orleans,

the New Orleans work itself was an outgrowth of his previous experience with the water works of Philadelphia.²⁰

The Philadelphia water-works project displayed both Latrobe's good and bad traits. On the positive side, he had been in the city only two months when he sketched out a plan for a water-works dramatically different from a canal system espoused by the local establishment. Latrobe's plan quickly won adherents and he was named engineer of the project. Unfortunately, Latrobe's poor abilities with finance also became readily apparent. He was not a good estimator, and his passionate and creative nature was perhaps not in tune with some sober Quaker backers. One, Thomas Cope, recalled in his diary that he was "mortified, vexed and embarrassed" by "our crafty Engineer." "He has talents-- I wish I could add that he possesses equal economy, honesty and system," Cope confided to his journal. Nevertheless, Cope confessed that tears of joy came to his eyes when the fountain in the park fronting the water-works began flowing with water.²¹

In spite of his difficulties with Philadelphians, Latrobe, with his gift for languages and his artistic and scientific interests, found a ready admirer and supporter in President Thomas Jefferson. Jefferson championed Latrobe, even seeing that he received a contract in 1804 to prepare plans for a lighthouse at the mouth of the Mississippi. In a second Louisiana project, Latrobe in 1807 was contracted to design and build a Custom House in New Orleans for the Federal Government, and he hired Robert Alexander (1781-1811), Virginia native and Washington builder, to supervise construction. This Custom House would not last a decade, possibly collapsing because of the use of soft local brick. Robert Alexander died in New Orleans, leaving debts secured by Latrobe.²²

Exactly who first made the suggestion that Latrobe design the New Orleans water-works and when that suggestion was made can be not exactly known. To anyone considering water-

works construction in America at the beginning of the nineteenth century, Latrobe was an obvious choice, especially since President Jefferson had been steering professional contracts his way. Mayor Watkins of New Orleans initiated contact with Latrobe in 1806, and in a letter to Robert Alexander from Washington, July 27, 1811, Latrobe recalled that in 1805 or 1806 a French visitor to the Philadelphia water-works had suggested he construct something similar for New Orleans. Latrobe would write another letter on August 11, 1811, saying that "Mr. Jefferson was the first who by desire I believe of [Governor William] Claiborne, asked my opinion on the subject, during the business of [Aaron] Burr's trial at Richmond [summer of 1807.]", Steam engineers Oliver Evans (1807) and James Smallman (1809) had also been asked to look into New Orleans water works possibilities but neither followed through. Both would also be contacted by Latrobe when he was shopping for steam engines. ²³

In its first effort to solve its water problems, the New Orleans City Council in May of 1810 contracted with Louis Gleises of New York to put in wooden pipes along Vieux Carre streets and supply hand-pumped river water to subscribers (with usage available for street cleaning and fire-fighting.) Gleises had first sent the City Council a letter proposing a water-works on April 18, 1810. It was referred to a committee of the council. The committee asked Gleises to show them his plans, and met again before a special May 5 Council meeting to consider whether the fact that Mr. Gleises felt that his plans were secret (he was also promising to supply clarified water) should preclude his having a contract. They decided it did not, and forwarded Mr. Gleises's request to Mayor James J. Mather for action. The contract was approved by the Mayor on May 10. Some clauses needed to be amended, and in the May 16 meeting the Council gave the Mayor another eight days to secure a contract. In spite of this, in the August 15, 1810, meeting the Council considered an Alexander and Latrobe water-works

proposal which was being sent to the legislature for funding approval. Nothing would come of it. In fact, on September 12, 1810, a Sieur Merillet was asking for the privilege of supply the city with pumped water. This also came to naught.²⁴

Latrobe's papers reflect his continuing interest in a water system for New Orleans. He kept a copy of a letter from James Smallman in Philadelphia to [William E.] Hulings, a former New Orleans City Council member, dated 24 July 1809. Smallman offered a bid of ten thousand dollars to furnish a steam engine "complete with a wrought iron boiler, fly wheel, rising main, pump trap, rods, buckets and boxes" that would pump 757,620 gallons of water a day and would be built "in the newest and completest manner." Included in the price was delivery to New Orleans and the setting up of the system, if the city furnished a building and construction supplies. Smallman noted that the "pipes of the main streets" should be larger than the three inches specified by Hulings, to avoid clogging.²⁵

In his notes on New Orleans' water system, Latrobe also kept a copy of "information I received from Mr. Bannerman, who has long been engaged with the waterworks" of Philadelphia. Bannerman described the Philadelphia system designed by Latrobe and expanded in size, and then offered advice for New Orleans: "Were it practicable to distribute the water in New Orleans by means of a water wheel [sic], great expense to the city would be saved. " If a steam engine were used, however, Bannerman thought three inch pipes on the main streets would suffice, and money could be saved by joining wooden pipes to each other, without metal connectors. He had great faith in the usefulness of local wood, referring to the "incorruptibility of your yellow cypress." Such logs would last for a century, he predicted.²⁶

Using Alexander as his New Orleans agent, Latrobe had begun attempting to get the legislature of the Territory of Orleans to approve a water-works project as early as 1809. This

failing, and having divested himself of Alexander, Latrobe sent his 18 year-old son Henry to New Orleans to negotiate with the City Council, taking the advice of Louisiana Governor William C.C. Claiborne who spoke with Latrobe while on a Washington visit. Henry arrived in January of 1811, an accomplished draftsman and beginning architect, with fluent French at his command. On May 22, 1811, the council granted Latrobe a franchise to build a water-works, and it is possible that Latrobe had purchased the earlier Gleises contract from the principal. His own contract required Latrobe and his associates to complete the project by May 1, 1813, with two thousand feet of pipe laid by that date. The franchise was for fifteen years, with a five year optional renewal. Water fees were not set, but fire fighting, street cleaning, and public buildings would have free service.²⁷

In spite of that two year deadline, Latrobe would be involved with the water-works in New Orleans for nine years, making it the longest engineering project of his life. Indeed, Latrobe would be involved with the water-works until his death in 1820. Besides the intervening War of 1812, which halted construction, the technical difficulties of the project lay in the location of New Orleans, far from manufacturing centers (thus necessitating more on-site fabrication) and in the city's climate (in which un-laid wooden pipes quickly rotted) and predilection for epidemics. Actually, the design was relatively simple from an engineering standpoint and similar to his Philadelphia plans: a suction pump would draw water from the middle of the river (a wooden pier would protect the cast iron pipe, which was also routed through the levee) and a steam engine would raise the water to wooden reservoirs from which it could be distributed through the city. Wooden pipes would be placed along Levee (Decatur) Street, with smaller wooden pipes running along the crossing streets of the Vieux Carré. From the pipes there would be a simple arrangement to provide water via pumps, set up at intervals.

Households along the route could use water for a fee. Cast iron fire plugs with screw fittings for hoses, and stopcocks (valves that were regularly spaced to isolate leaks) would be part of the system. Drawings of plans for the New Orleans water works included a map with notes, probably done by Henry Latrobe in 1811, and some pipe joint sketches for the engine attachments and a drawing of plans for the wooden pier by Latrobe himself. Henry Latrobe's sketches show the type of public pump used in Philadelphia: a sunken wooden tub is constantly refilled from the street pipes through a float and valve device. A pump at street level brought up water from the tub. Presumably the New Orleans plan included these devices.²⁸

A major hurdle for Latrobe was financing the project. The forming of a private corporation to contract to supply the city's water was a viable solution to a municipal need. This was the route Latrobe would take. Having been far too optimistic about past projects, he had a great deal of negative prior experience in trying to finance ventures, most of which had gone awry. Consulting Jacob Mark, a New York financier, Latrobe set up a company capitalized at \$120,000 with 240 shares (half of which went to Latrobe for his investment of time and talent.) The New Orleans City Council subscribed for 12 of Latrobe's shares, Mark purchased some (far fewer than expected), and Frederic C. Graff of Baltimore took some, along with some other investors. Frederick Graff (1774-1847), who achieved fame as an engineer in his own right, was Latrobe's chief draftsman on the Philadelphia water works, and for years continued to manage the Philadelphia water system.²⁹

Latrobe badly underestimated construction costs and the time the project would take. In all, he would ask for and receive five extensions. Even the original site turned out to belong to the Federal government, so the adjacent location on Ursuline and Levees Street was chosen.

Once the site was acquired, Latrobe had difficulty finding a suitable engine. He even attempted to construct one himself in a Washington foundry he began in a building he had originally built as a studio for the painter Gilbert Stuart. True to Latrobe's financial luck, Stuart used the building for a year and never paid rent. The intervening War of 1812 prevented heavy freight from being shipped to New Orleans, and discouraged travel there. George Evans of the Pittsburgh Steam Engine Company wrote Latrobe December 14, 1814 and declined to complete building and installing his steam engines. "We think it best to defer it till the fate of that section of the Union is decided and the uncertainty of money transactions at an end," he wrote. Only in 1818 would Latrobe acquire a used steam engine suitable for the project. So many things went wrong during Latrobe's water-works project that a mere listing of his travails is impressive. His problems included a severe winter in 1815-16; yellow fever, a fire which destroyed one of Henry's New Orleans architectural projects, stock fraud with forgeries of Latrobe's signature in 1820, and the difficulties of boring wooden pipe. Even his son Henry's architectural work in New Orleans saw profit filtered into the water-works. Henry had become his father's on-site manager, as well as a trusted professional colleague. He had been a good citizen of his adopted city, even serving as an assistant engineer at the Battle of New Orleans. Unfortunately, Henry succumbed to yellow fever and died in New Orleans September 3, 1817.³⁰

Mourning the death of his son, Latrobe wrote the City Council asking for another extension. He pointed out that by that time, October 13, 1817, the engine house and engine were in place and only the mechanical equipment not yet shipped from New York and Pittsburgh needed to be installed. Latrobe was frank about his desperate need to finish the project, and noted "I have now arrived at a period in the history of my exertions [at which] my whole fortune and comfort in advanced life depends upon a few months of perseverance." He promised

"before the autumn of 1818 shall be closed, to procure for you such a supply of water, as shall remove many of the evils, of which its deficiency may be the cause." ³¹

Beset by financial difficulties, Latrobe now saw the New Orleans project as his family's only hope for financial survival. In 1818 he sent Andrew Coulter, an engineer, to New Orleans to supervise the works. The engine on the site at the time of Henry's death had been there so long it was inoperable, so a new one had to be procured. He finally obtained all the engines and machinery necessary and shipped them to New Orleans, also. As soon as he was able to leave Washington and his work on the Capitol building, he went to New Orleans himself, where he energetically found work on other projects besides the water-works. Latrobe spent part of the Spring of 1819 inspecting timber. He placed advertisements in the Louisiana Gazette beginning March 15, 1819 asking for pine or cypress logs, at least sixteen feet long and twelve or fourteen inches across. These would be made into pipes, bound with iron, and joined by smaller iron pipe joints wedged into connecting ends of drilled logs. Latrobe had himself designed the pipe boring machine, run by yet another steam engine and similar to ones he had used in the Washington Navy Yards mill project.

He bought a house about a mile below the city in July of 1819, and after returning to Baltimore to complete his work on the Roman Catholic Cathedral there, he brought to New Orleans his wife, his daughter Julia, and his sons Ben and John, then a cadet at West Point. Latrobe contributed much to the New Orleans's appearance. Besides the tower design for the St. Louis Cathedral, he designed a hoist for New Orleans merchant Vincent Nolte and prepared a plan for a fountain in the Place d'Armes, later Jackson Square. Presumably this fountain would have been an ornament to the New Orleans water -works as the Philadelphia fountain had been. Optimistic as always, Latrobe saw with pleasure that his design for the Louisiana State Bank was

accepted and, as he continued to finish the water-works project, he began to see a bright and prosperous future for his family. It was not to be.³²

In the late Summer of 1820 Latrobe was working on the laying of the intake pipe into the river. When he cut through the levee, three weeks of incessant rain began. For fear of a levee break, the city allowed prison labor to be used to hasten laying the pipe. The heat, the difficulty of working in rain and mud, and certainly the stress of nearing the completion of his long ordeal may have weakened him physically, but it was the bite of the *aedes aegypti* mosquito (a species he had observed and described in his journal) that transmitted the yellow fever that killed Benjamin Latrobe on September 3, 1820 -- exactly three years from the day his son Henry died of the same malady. Ironically, because of its lack of a good public water system, New Orleans suffered regular epidemics of the plague until the disease-carrying propensity of the mosquito finally became known. One of its breeding spots was standing water in cisterns, used to store rainwater by New Orleans householders. The city was finally made safe from the disease with a program of screening cisterns initiated in 1905, the period when the new water system was coming on line.³³

Latrobe's death was a tragedy for his family. His son, John, dropped out of West Point. His family received no money from the as yet incomplete water-works project: in fact, they were rather tactlessly assured by New Orleans attorney Edward Livingston that he would personally see that any assets due Latrobe would go for prior debts elsewhere. One kind New Orleanian was Vincent Nolte, the merchant, who sent the Latrobe's one hundred dollars. From all the money that Benjamin Latrobe had personally expended to keep the project going, his estate realized nothing. The remaining Latrobe's relocated to Baltimore where, keeping with them a wealth of family papers, plans and sketches detailing their ancestor's past glories, they continued to make

their mark on America. His sons would be successful. John became an attorney and was a counsel of the Baltimore and Ohio Railroad. Benjamin became a civil engineer and chief engineer for the same railroad. And, sister Lydia had married Nicholas Roosevelt, and had accompanied him on the first steamboat ride down the Mississippi. Later, a Latrobe descendant became the wife of New Orleans architect and twentieth century preservationist Sam Wilson. He had met his wife, Ellen “Betty” Latrobe, in Baltimore while researching Latrobe’s New Orleans work. The Wilson’s personal collection of Latrobe papers is housed at the Tulane University library Special Collections Division.³⁴

At his death, Latrobe's assets were frozen. This meant that the water-works corporation was in limbo. Immediately the City Council began putting the water-works on their agenda. In their September 9, 1820, meeting, less than a week after Latrobe's death, they reiterated the interest of the corporation (meaning the municipal government) in the project. Although the pipes had been laid, the water-works was still no more than a work in progress. In December, two councilmen, Messieurs Carraby and Hiligsberg, were named as members of the New Orleans Water Company Board, as the water-works corporation was called. By April of 1821 the assets of the water-works corporation were ready to go to a sheriff's sale to satisfy debts, including most probably Latrobe's notes and obligations for labor, supplies, and equipment. Mayor Joseph Roffignac notified the council that as soon as the assets were sold the city could get its investment money (for twelve shares) back. On April 21, the council gave public notice of the city's lien on the water-works. The sheriff's sale was to take place on April 30, and, rather than wait for some possible buyer, the Council authorized the mayor to buy the water-works and all its machinery on behalf of the city.³⁵

A recurrent theme in New Orleans's struggles with water is timing. For there to be a productive confluence of power and science, good timing is essential. Only at an appropriate time will a scientific advance or a new idea be acceptable to those with the power to have it implemented. If the idea or advance is presented at the wrong time – perhaps before it has become accepted practice elsewhere, or if it is judged too expensive or too radical a change from past practices, or even if the presenter is not respected as an authority on the subject – then it will not be accepted for use. During Latrobe's period of involvement with New Orleans in the 1810-1820 period, there was a crevasse – a break in the levee – and a Mississippi River flood. Latrobe studied the problem, and came up with a simple solution for strengthening levees and closing the crevasse. Woven mats of willow trunks and branches, called fascines, could be affixed to the levees as a strengthening device and staked to the existing levees, weighted into the river, and when silt had filled them would form a barrier to the flood. Latrobe wrote out his idea, cited prior European use of the devices, and presented it to the Mayor in August of 1816 for the City Council's consideration. It was not accepted. Perhaps it was rejected because Latrobe had not been recognized as a levee expert, or because the city was averse to spending money on levees in this manner, or because the idea did not appeal to them. Ironically, river levee construction and repair today makes some use of similar methods, and the crevasse in the 1840s was finally closed using a version of fascines, also. Had Latrobe's idea been put into use in 1816, other crevasse catastrophes might have been avoided or more quickly solved. As would happen often in New Orleans, when those with the power to make decisions did not agree with the spokesmen for science, the reason may have been that the idea was presented at the wrong time.³⁶

End Notes

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⁷ Jerah Johnson, "Dr. John Watkins, New Orleans 'Lost Mayor,'" Louisiana History, Vol. 36, No. 2, Spring, 1995, 187-192.

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⁹ Ibid.

¹⁰ Ibid.

¹¹ John G. Clark. New Orleans Economic History, 296.; Jerah Johnson, "Dr. John Watkins," 193.

¹² Talbot Hamlin, Benjamin Henry Latrobe, (New York: Oxford University Press, 1955), 3-49.

¹³ John C. Van Horne, ed. The Correspondence and Miscellaneous Papers of Benjamin Henry Latrobe, Vol, 2, 1805-1810, Series IV of The Papers of Benjamin Henry Latrobe, Edward C. Carter II, Editor in Chief., note on 617; Hamlin, Benjamin Henry Latrobe, 25; note on 71..

¹⁴ Talbot Hamlin, Benjamin Henry Latrobe.

¹⁵ Carroll W. Pursell, Ed. Technology in America: A History of Individuals and Ideas (London: MIT, 1981), Darwin H. Stapleton “Benjamin Henry Latrobe and the Transfer of Technology,” 34-44.

¹⁶ Darwin H. Stapleton, “Introduction Essay”, Edward C. Carter II, Editor in Chief, The Papers of Benjamin Henry Latrobe, Series II, “The Architectural and Engineering Drawings”, (New Haven: Yale University for the Maryland Historical Society, 1980), 48-71.

¹⁷ Ibid, 51-53.

¹⁸ Ibid., 53-54.

¹⁹ Ibid., 56.

²⁰ Ibid., 57-61.

²¹ Eliza Cope Harrison, ed., Philadelphia Merchant: The Diary of Thomas Cope 1800 - 1851, (South Bend, Indiana: Gateway Editions, 1978). 60, 385, 386.

²² Benjamin Henry Latrobe , Impressions Respecting New Orleans.; Diary and Sketches, 1818-20, Samuel J. Wilson, Jr., Ed. (New York: Columbia University Press, 1951), xiv. Van Horne, Vol. 2, p. 422 note.

²³ John G. Clark. New Orleans Economic History, 296.; John C. Van Horne, ed .The Correspondence and Miscellaneous Papers of Benjamin Henry Latrobe, Vol, 3, 1811-1820, Series IV of The Papers of Benjamin Henry Latrobe, Edward C. Carter II, Editor in Chief,. (New Haven: Yale University for the Maryland Historical Society, 1986), 117. 119; Van Horne, Vol. 2, 809

²⁴ New Orleans City Archives Collection, Proceedings of the City Council, Louisiana Department, New Orleans Public Library.

²⁵ Latrobe Papers, Tulane, Folder 1

²⁶ Ibid.

²⁷ Van Horne, Vol 2, p 808 - 811. Benjamin Henry Latrobe Papers, Collection 584, Tulane University Archives and Special Collections, Jones Library, Folder 1, Item 3, handwritten note by Sam Wilson, “Louis Gleises being unable to secure materials and workmen , he sold his interest to Latrobe.”

²⁸ Edward C. Carter, II, Editor. The Engineering Drawings of Benjamin Henry Latrobe, Series II (New Haven: Yale for the Maryland Historical Society, 1980), p 199- 205.

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- 29 Clark, 297; Hamlin, note 134.
- 30 Latrobe, Impressions, xx . Van Horne, Vol. 3, 946.
- 31 Latrobe, Impressions, xxi; Latrobe Papers, Tulane University, Folder 3.
- 32 Van Horne, Vol 3, 1008.; Baudier, Part V..; Latrobe, Impressions, xxii.
- 33 Latrobe, Impressions, 142.
- 34 Van Horne, Vol 2., 1067. Mary Latrobe wrote this news to Robert Harper in Baltimore.
- 35 City Council meeting September 9, 1820, April 30, 1821.
- 36 Engineering Drawings of Benjamin Latrobe, 44, 210, 211, 212.

Chapter 3. Building Blocks, 1818-1830

At their meeting on April 21, 1821, the City Council of New Orleans authorized the mayor to buy the city's privately built water works before the building and machinery could be sold at a scheduled sheriff's sale April 30. The building and machinery were on sale because, on the death by Yellow Fever of the water franchise holder, Benjamin Latrobe, the waterworks which he had built was seized to pay the debts of Latrobe and his waterworks company. His creditors wanted their money, whether the city had running water was not their concern.¹

Finally, after protests from some share holders and negotiations with Latrobe's creditors on the price, the city of New Orleans on May 26, 1821, bought the water-works, including everything, for \$10,000. Actually, the money was advanced to the city by one of the council members, the merchant W.W. Montgomery. Montgomery was repaid promptly by a bank draft on a discounted \$12,000 city note. Meanwhile, the Council also heard from Mr. Coulter, the engineer, who needed money to start the engine and make repairs. By July, the Mayor was asked to get bids on fencing the water-works property, so apparently things were progressing.²

That things were not progressing fast enough for Montgomery became obvious on September 1, 1821, when he suggested to the Council that they offer a prize of \$500 for the best plans to operate the steam pump, and by this means supply the city with water for street cleaning, for fires, and for the daily consumption of its inhabitants. A week later his suggestion was referred to a committee, where it died, perhaps because the Council members were understandably cautious about the city's limited funds, those moneys also being used to pay the Councilmen for their duties of attending the Council's Saturday meetings. His contest scheme

failing, Montgomery then suggested that the council contact Nicholas Roosevelt, a noted steam engineer who was also the late Latrobe's son-in-law.³

The need for a reliable water source in the crowded inner city, today's French Quarter, was so desperate by April of 1822 that the Mayor sent a message to the Council that he was asking residents along Levee (Decatur) Street to dig their own wells on each block for fire fighting. In May, Montgomery persuaded the Council to ask the Mayor to appoint, with the Council's consent, a competent person with a knowledge of hydraulics to complete the water-works. Thus, as usually happened, the political power structure sought someone with scientific or technical knowledge to solve the problem of water. On June 1, 1822, the Mayor made his appointment: Francis B. Ogden, a former aide de camp to General Andrew Jackson at the Battle of New Orleans and an accomplished engineer. The appointment was confirmed. In addition, the Council on June 22, 1822, charged Ogden and Montgomery with the task of going to Philadelphia to purchase the cast iron pipes and other equipment necessary for the water-works of the city. Montgomery asked the Council for a formal leave of absence until November.⁴

Although the bureaucracy was moving forward with the project, during June of 1822 the mayor was forced to run an advertisement in two newspapers admitting that the water-works would take still another year to complete, and asking his fellow citizens to take what precautions they could to keep the streets clean and remove standing water from gutters. Not to be outdone, the Board of Health ran a notice deploring the ineffective gutter cleaning done by the city, suggesting that "said gutters should be swept and washed every day by means of fresh water taken from the river, or from the wells of the citizens."⁵

Also in 1822, John Adams Paxton's New Orleans Directory and Register, was less than complimentary about the city's handling of its water supply problems. Paxton credited himself

with having published a similar directory while a resident of Philadelphia, and having a passing acquaintance with that city's water-works, no doubt saw himself as an expert. In describing New Orleans, he made note that the water-works building was erected in 1813, "but it is not yet finished and has already cost the city \$25,000." Mr. Paxton then went on to give his own theories about the water- works. For one thing, the intake point should be located farther up stream, since the present spot was so filthy "the very thought of which is sufficient to turn the stomach of a person of delicate constitution." Furthermore, a floating pump in the river would be cheaper and better for supplying the water for fighting fires, cleaning gutters, and keeping down the dust "which so much annoys the citizens in dry weather." The enterprising Mr. Paxton had more than a journalist's interest in the floating pump, since he had somehow acquired one. The model of his "machine for raising water from the river" was to be demonstrated on the Fourth of July, 1822, but the event was cancelled by rain. It was re-scheduled for the following Sunday, but since there were no later reports of its success, the Paxton pump project must have come to naught. ⁶

Meanwhile the water-works were operating, probably only in a limited manner, and with the now unsatisfactory wooden pipes. The Council on July 13, 1822, confirmed Andrew Coulter to continue as provisional engineer until November at a salary of \$150 per month and charged him with making repairs. Francis Ogden and W.W. Montgomery left New Orleans on their quest for cast iron pipe and supplies.

Ogden kept careful records. By July 22, 1822, he was in Philadelphia meeting with Frederick Graf, Latrobe's former associate and later investor, "an extremely intelligent man," who toured him around the Philadelphia water plant and gave him introductions to pipe manufacturers. The next day Ogden made contact with Samuel Richards, whom he asked for

quotes on pipes and fixtures. He then left Philadelphia for New York in search of Montgomery. "I wrote him urging the necessity of immediate attention to our business," he noted in his journal. Montgomery seemed to Ogden to be somewhat lax in attention to his quest.⁷

By August 5, 1822, Ogden and Montgomery had serious differences of opinion. For one thing, Montgomery was a believer in American-made products. "On my suggestion that it might probably be for the interest of the city that pipes should be imported from England, he insisted that we ought to get them of American manufacture even though they cost 20% higher here," Ogden testily wrote in his copybook. Ogden was also annoyed that Montgomery seemed to have a different agenda from the obvious one of buying pipe at a good price. He underlined his notes of a conversation with Montgomery that same day: "he says he must first see Mr. Nolte to know from him if he intends continuing with his contract." Presumably Ogden did not realize that the Nolte was going to pay the bills. By August 10, 1822, Ogden was deep in negotiations about pipes. Bids were arriving, and Graf even sent some sketches of the types of connecting devices needed, which Ogden copied into his journal. Ogden's next negotiations would concern the manner of payment. His understanding was that the city council required delivery and payment in New Orleans, but he knew that the cash price for New York delivery would be much less, and that seemed appealing. Ogden wrote Montgomery on August 17, 1822 and told him that he had advised the bidders of their delivery and payment requirements. He also told Montgomery that he "had no doubt from the first that this would have to go through the hands of a merchant, who of course would be entitled to, and would pretty well earn, his regular commission" and that he wished Montgomery would handle all the financial aspects. In spite of this, Ogden continued negotiations, even getting prices and payment requirements from Joseph Lewis, who was selling English pipe.⁸

On August 22, 1822, Montgomery, in Boston, wrote a blistering letter to Ogden, who was in Elizabethtown, New Jersey. In no uncertain terms he told Ogden to be absolutely sure the Mayor was sending funds to New York or Philadelphia to pay for the pipe, since no merchant (acting as a broker) would sign for the pipe without having payment in hand. "I am sure I would not, neither would I recommend any of my friends to do it," said Montgomery bluntly.⁹

Ogden began by being conciliatory in his August 27, 1822, reply, re-stating the earlier agreed upon dates for the city's payments (half on November 10, 1822, and half on May 10, 1823, for delivery of pipes.) Then he reminded Montgomery that "perhaps the lives of thousands may be sacrificed to what I consider a most unimportant question, whether freight, commission, and insurance is to be paid to the manufacturer, or to the merchant," and that Montgomery should be more flexible in his requirements. He also slyly jibes Montgomery for a lack of faith in New Orleans' fiscal stability. Ogden then applied to William Kemble of New York to act as New Orleans' agent to purchase the pipe and ship it, but, as Montgomery wished, he broke off negotiations with Howells and Richards. Ogden left an opening for more discussion with Richards, however, because his foundry was fabricating pipe and might have some available for New Orleans in any case.¹⁰

On August 29, 1822, Kemble wrote from New York accepting the commission of paying for the pipe in New York and shipping it to New Orleans, for a fee of a two and a half per cent of the net cost of pipe, plus other expenses, and a possible five per cent charge for a rate of exchange between New Orleans and New York. Ogden then wrote the Mayor and Council with that proposal, promising "I think I may probably then effect the contracts in time to give water to the city in the course of the next Summer," without additional cost. Montgomery was finally satisfied with Ogden's arrangements. He wrote August 31, 1822, saying that he and Nolte were

both in Boston, and Nolte would get the money to the New York agent. Montgomery only asked that Ogden would forward a copy of the City Council resolution empowering Ogden and Montgomery to act as agents. At this point in the notebook Ogden inserted a sheet of figures for pipe carrying capacity, calculated from formulas supplied in the Encyclopedia Britannica. Montgomery then wrote stating that they needed to have the National Bank of Philadelphia issue bills guaranteeing the payment by the Mayor of New Orleans. Montgomery then persuaded Ogden to write Kemble asking him to reduce his entire fee (including commission and rate of exchange) to three and half per cent since the Philadelphia Bank would guarantee the Mayor's payments in New York. Kemble agreed. When Ogden resumed negotiations with both pipe suppliers he learned that Howells' foundry's pipe had all been sold elsewhere, and so the contract went to Samuel Richards.¹¹

Ogden wrote the City Council on September 23, 1822 that the pipe had been purchased, and although a smaller amount than ordered would be ready for delivery in New York by December, the city might have a working water-works by mid-1823.¹²

During the Fall of 1822 the water-works continued to function with Coulter as engineer, and his contract was continued past November. Coulter made a report to the Council October 12, 1822 on the "actual condition of the steam engine," which probably still needed repair. The pipes ordered by Ogden arrived in January, 1823, but the second shipment of pipe, ordered for the Spring, was first delayed and then canceled when Kemble and Richards announced that they could not supply the needed quantity. The City Council on June 21, 1823, passed a resolution to get more pipe elsewhere, and described this shipment as being supplies for the Faubourgs St. Mary and Marigny, areas below and above the Vieux Carre'. Apparently the January shipment

had sufficient quantity to lay the cast iron pipe along Levee (Decatur) Street and on the Vieux Carre' cross streets.

That the water-works was fully functioning by the Summer of 1823 can be surmised by a resolution passed by the Council on July 12, 1823. In response to complaints by residents of the "back of town" area farthest from the river that the water-works was flooding their property, the Council authorized the Mayor to ask Coulter to run the water for two hours only every other day during a ten day period. Coulter was also cautioned to watch the rise and fall of the water carefully. At this point, it might be said that the water-works was working too well.

After he completed the complex financing negotiations for the pipe shipment, Ogden prepared a presentation to the City Council on building a brick reservoir, but it was never constructed. Timing was not right for his reservoir idea: only in the next decade would a reservoir be constructed when the Commercial Bank was formed for the express purpose of financing a new water system. So, the first New Orleans water-works -- with a building designed by Henry Latrobe, engineering by Benjamin Latrobe, cast iron pipe laid in by Ogden, and with replacement machinery installed and repairs made by Coulter -- kept New Orleans supplied with water until the system was replaced around 1835.

A witness to the condition of the water-works in 1834 was Latrobe's son John. During a visit to New Orleans, on November 16, 1834, he wrote in his journal:

"The water works erected by my father are in operation, and at the corners of the cross streets along the Rue de la Levee, I saw this morning the water bubbling up from the pipes into the large cast iron box around them, and running off in a rapid stream through the gutters,

"At every corner were crowds of negro women filling their buckets and water carts supplying themselves from a less defiled place than the margin of the river. After my fathers death these works, in an unfinished state, fell into the hands of the corporation [the city government], and the mode in which they are at present used, is much less efficient than they were capable of under a proper management." ¹³

Even taking into account the understandable bitterness John Latrobe may have felt, he gave what appears to be a fair assessment of New Orleans' water-works at that time: it was not as good as it could have been, but at least it worked after a fashion. That may be a good description as well of the early years of American municipal government in the former French and Spanish colonial town.

End Notes

¹ Conseil de Ville meeting September 9, 1820. All council meetings referred to are recorded in the New Orleans Public Library's New Orleans City Archives Collection, along with the Mayor's Record books which contain correspondence to and from the Mayor; Council meeting of April 30, 1821.

² Detailed in minutes of the Council meeting of June 30, 1821; In Paxton's New Orleans Directory of 1822, William and Jonathan Montgomery were listed as merchants, with a location at 15 Magazine St., corner Common. In Thomas H. Whitney's New Orleans Directory of 1811, W. and T. Montgomery were listed at 19 Levee Street. The 1810 census has two white males aged 26 and 45) named Montgomery living on St. Louis St. Clark, 344, lists Montgomery as a director of the Second Bank of the United States in New Orleans in 1816. A June 5, 1860 edition of the Daily Picayune announced the death of Mrs. W.W. Montgomery, nee Marie Pulcherie, in Paris on May 14, 1860. Montgomery was an American, a merchant, and a sometime politician and banker: just the sort of businessman-adventurer New Orleans at that time attracted. Having a French-Creole wife would have been typical. Montgomery may not personally have profited, but the bank discounting the note would have. It is possible that it was the bank of which Montgomery was an officer.

³ Council meeting of September 15, 1821. Having their names listed by the clerk on the attendance role, or having a properly excused absence was the only way in which councilmen could be assured that their paychecks were forthcoming. This was often an object of councilmanic concern. Council meeting of November 24, 1821. Nicholas Roosevelt with his wife Lydia Latrobe made the first steamboat voyage down the Ohio and Mississippi Rivers. in 1811 and 1812.

⁴ Council meeting of April 4, 1822; Council meeting of May 25, 1822; Appleton's Cyclopedia of American Biography, Vol IV. (New York: D. Appleton and Company, 1888. Frances Barber Ogden, born 1783, Boonton, New Jersey, son of Revolutionary War General

Matthias Ogden. An engineer, he built the first low pressure condensing engine with two cylinders, patented 1817. Served as U.S. Consul in Liverpool, 1830-40 and in Bristol, 1840 to his death in 1857. Helped make John Ericssen, the inventor of the Monitor ironclad, known in America. The first steam driven screw propeller, an Ericssen invention, was on a vessel named the Francis B. Ogden.

⁵ Louisiana Gazette, New Orleans), June 22, 1822, and Louisiana Courier, New Orleans). June 28, 1822, with other days publication in both journals. The text of the announcement reads:

" Considering that the execution of the plan definitively adopted by the City Council, for putting into active operation the Water Works, demands at least a year's labor, before the object of that establishment can be obtained.

"That insurmountable circumstances have disappointed to a certain extent the views of the Council, by opposing themselves to measures by which it had hoped to have given, provisionally, this year water for the streets of the city.

"That the excessive heats which have already been experienced, permitted no works to be carried on to effect, by gutters, the irrigation of the city, and demand, at the same time the most scrupulous attention and activities for the maintenance of the cleanliness so essential to health.

"The Mayor of New Orleans invites his fellow citizens to unite their efforts to his, to prevent, if possible, the melancholy effects which may result from the inclemency of the season, coupled as it is with the insufficient means opposed to it. He recommends in consequence, to the citizens of New Orleans, the strict observance and faithful execution of the regulations and ordinances of police concerning the public health and relative, as well, to the watering of the streets at the hours and in the manner prescribed, as to the removing of stagnant waters, unclean animals, matters subject and liable to fermentation and putrefaction, &c. so, and he hopes that the general co-operation will remedy the evils which might give cause for apprehension in the threatening aspect of the season. J. Roffignac, Mayor." All of which is political talk by elected officials terrified of having an epidemic.) Louisiana Courier, New Orleans) July 5, 1822. Although the Board of Health notice may have been addressed to the citizens, it seemed to be aimed at the Mayor and Council, who bore responsibility for the lack of piped in river water.

⁶ Paxton, 41; Louisiana Gazette, New Orleans). July 6, 1822

⁷ Van Horne, Vol 2, note on 724. Samuel Richards 1769 - 1842) a wealthy iron merchant who owned two furnaces; Francis B. Ogden, "Copybooks, drawings, notes and receipts 1822-1824", New Orleans City Archives Collection, New Orleans Public Library Louisiana Department. Ogden went to great pains to record his opinion of the pipe buying negotiations. Since he and Montgomery often disagreed, Ogden probably intended to use his records to support his actions should he have to defend them later. Ogden, July 23, 1822.

⁸ Ogden, August 5, 1822; Van Horn, Vol 3, Vincent Nolte 1779-1856) was a French native who was a successful New Orleans businessman. He was in the city at various times from 1806 into the 1820's. At the City Council meeting of January 25, 1823, Nolte loaned the city \$150,000, and this would have covered the first payment for shipments of pipe, on which they had estimated the cost to be about \$40,000. The city would issued warrants on the Nolte loan

for the water works payments. In addition, there were other expenses to be covered by these funds. Montgomery had also been charged by the City Council with finding a paving contractor and making arrangements for street paving. Nolte's book, Fifty Years in Both Hemispheres; or Reminiscences of the Life of a Former Merchant (New York, 1854) became the basis for Hervey Allen's novel Anthony Adverse. Nolte had hired Latrobe as an architect and was generous to his family. He also shared Mrs. Latrobe's poor opinion of Edward Livingston. Nolte's New Orleans business would fail in 1825. Ogden, August 18, 1822. At this point in his journal Ogden inserts a brief essay "Reflections on the Subject of the water works of New Orleans" in which he muses about how it might be possible "to derive a benefit from any adventitious circumstances" in the water-works. He then sketches a plan for a brick enclosed reservoir holding two million gallons of water, located next to the levee between Ursulines and Hospital Governor Nichols) Streets. He notes that he intends to present this plan to the city Council. This is another water-works project that came to nothing. Ogden, August 20, 1822.

⁹ He was probably visiting family. Ogden was from New Jersey.

¹⁰ Ogden, August 27, 1822. "for surely we could never enter into a contract with a manufacturer with perfect good faith on his part and a suspicion on ours of the want of it, or of ability on the part of our Principals that would prevent our engaging in it ourselves or advising our friends to a like measure." Ogden, August 27.

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Ogden, August 29, 1822. "In addition, I shall have the honor on my return to New Orleans to lay before your board further results of my investigation from which it will be seen that after the first cost is incurred a sufficient income will accrue from the disposition of the water at least to pay all further expenses. Ogden notebook, August 31, 1822. Ogden, September 18, 1822

¹² Ogden, September 23, 1822 "I am greatly in hopes it will enable me so far to progress with the work as to effect the very desirable object of giving water to the city before the warm weather of the next Summer."

¹³ Samuel Wilson, Jr. Southern Travels: Journal of John H. B. Latrobe 1834, (New Orleans: Historic New Orleans Collection, 1986., 47.

Chapter 4. Banking on Improvements, 1830-40

As America began to form itself into a Democracy in the early decades of the nineteenth century, a dichotomy emerged: while the power to vote for elected officials was expanded to include a larger percentage of the population in the wake of Andrew Jackson's Presidency, the power of decision-making over expenditures for the public welfare was becoming more concentrated in an elite who were profiting by an increasingly sophisticated financial system and national economy. In the era of Andrew Jackson, while Jackson stood for the triumph of the common man and the evils of a national bank on the national stage, in New Orleans and in Louisiana, the conflict in political philosophy took a back seat to the usual ethnic and localized issues that marked Louisiana politics. Jacksonians in Louisiana might even be found among the ranks of bankers and financiers. Jackson's primary rival in Louisiana was Henry Clay, who most often drew his support from the Francophone segment of the population, while Jackson's support came primarily from the English speaking citizens. In addition, Jackson's command at the Battle of New Orleans won him allegiance – and criticism – in various quarters.¹

By the mid 1830s New Orleans had been operating its own water works for over a decade. The system was too small for the growing city and, in the progressive atmosphere of a busy American port, there was an impetus for civic improvements being funded by private enterprise. Where once there had been a simple web of local banks and bankers tenuously connected to finance centers abroad or on the Eastern seaboard (as the travails of Messrs. Ogden and Montgomery on their pipe-buying trip had illuminated) in the America suffused by the Democratic atmosphere of President Andrew Jackson and his successors, the economy of the

nation was beginning to take on a new guise of complicated relationships and large institutions. Concepts of money, finance, and the economy in nineteenth century America were difficult to define at the time, and our view of them today sees them as many-faceted and in a state of flux.

As a direct result of the then-existing financial system, decisions made to undertake work on urban infrastructure in the first half of the nineteenth century were governed by limitations on how this work might be funded. There are some overt similarities between today's funding of public works projects and those of the nineteenth century. For example: user fees and tax revenues were and are possible funding sources. As it is today, the more important question was: how can a big, and necessary, project be undertaken now and paid for later? How would credit be obtained, or how could this be financed over time? How can it be supported so it can continue to provide a service? Subsidiary questions to these might be: who profits from financing this transaction, and where will these funds originate? The answers of today are not the answers of the past, even if the questions are the same. An investigation of the financial structure of the city's economy in the period, with an emphasis on banking, will illuminate methods of infrastructure financing used in that era. And, the investigation of how such decisions were made, and by whom, can illuminate where decision making power lay, and why.

In New Orleans, in the early years, the colony was ultimately dependent on a European nation, either France or Spain, for financing large scale improvements. By the late eighteenth century, the Spanish empire was slowly dissolving and promised funding for the colony was seldom forthcoming. What little infrastructure work was done, in canal construction, dock improvement or levee building, was primarily financed by private landowners or sparse government funds garnered from taxes and fees. In New Orleans in the late eighteenth and first years of the nineteenth century, a very primitive system of monetary exchange used Spanish

paper money, Spanish specie (precious metal coinage, gold and silver), a barter system of goods and crops, and middle-men merchants and factors to enable the urban center and the agricultural hinterland to function, and in some segments, to prosper.²

With the Louisiana Purchase in 1803, New Orleans came into the United States economic system. In the following years this would govern how the city dealt with infrastructure needs. Concurrent with this was an expanding local economy. There were technological improvements that would focus state agriculture on two major cash crops: sugar and cotton. The 1790s revolution in Haiti removed the largest French Caribbean sugar producer from the market, and, by 1803, experimentation had proved that large scale sugar production could be possible in the cooler Louisiana climate. By the end of the eighteenth century, the cotton gin enabled cotton growers to produce seedless lint for cloth production quickly and cheaply. After 1810, the use of steam engines had immediate effect: steam boats could go up and down the Mississippi River quickly, and engines for grinding cane or running gins increased sugar and cotton production. These two profitable crops, plus growing river trade, assured that New Orleans would have need for a dependable system of finance.

Louisiana developed a two-pronged economic system: on the one hand there was large-scale agriculture, and on the other hand there were the commercial financial and trading enterprises in the metropolis of New Orleans. The city was large enough so that in the first half of the nineteenth century New Orleans consistently ranked in the top five American cities in population and in per capita wealth.³

One of the insistent needs of a large city with a vast hinterland for which it served as an entrepot was a money supply. Specie was scarce, although Louisiana's tenuous connections with Spanish-controlled mining areas meant that some coinage still came into New Orleans. The

city continually suffered from shortages of a viable means of exchange, and this lack of specie was felt throughout the United States. In other states, this had led to rebellions over taxes (taxpayers without access to money could not pay) and a complex system of bartered goods (which often resulted in production of alcohol from grain crops because of its value and its portability as a commodity.) New Orleans, already established as an urban trading center, had needs for a more sophisticated system, and the city was quickly included in the financial web that was being spun across the young nation.⁴

The American financial system developed in reaction to two separate English trends: one, promoting a central bank, dated from the Tonnage Act of 1694 that incorporated the Bank of England as a means to raise government funds; and the other, the Bubble Act of 1720, a reaction to the collapse of the South Sea Company, which forbade other banks being formed by corporations. One trend supported the idea of a strong, central bank, while the other would limit other banks from forming in competition.⁵

The concepts that it was inherently evil to be in debt and that it was also evil to profit from interest were part of Christian religious teaching, and some Americans believed those tenets should be reflected in the law. The opposing ideas, that available credit could finance an expanding economy and that borrowing was necessary for growth, became obvious both to farmers (who needed credit to exist between crop sales) and merchants (who needed credit to maintain inventories.) At different times, both those against banking and those supporting banking dictated American policy. The Federalists, with Alexander Hamilton as spokesman, recognized the need for banks and, moreover, wanted, and got, a national bank. Andrew Jackson is generally given the role as spokesman for the arguments against a national bank, and, indeed, it was under his presidency that the Bank of the United States (the second one formed) ceased to

exist. While Conservative Whigs championed Henry Clay, and the Democrats had Andrew Jackson, neither Louisiana faction exactly subscribed to their leader's philosophy: New Orleans financier Maunsel White was an ardent Jacksonian. Local and ethnic concerns were paramount in Louisiana politics.⁶

New Orleans's needs for some sort of banking system were quickly addressed after the Purchase. The first territorial governor, W. C. C. Claiborne, quickly chartered the Bank of Louisiana, and the U.S. Secretary of the Treasury, Albert Gallatin, as quickly authorized a branch of the first Bank of the United States to open in the city. Both were in business by January of 1805.⁷

The Bank of the United States was not a national bank, charged with regulating the nation's currency supply. It was, rather, a bank granted a national charter, and having branches in various states. By taking deposits and making loans in various locations the bank would, in effect, have a nation-wide scope, and, by having federal funds on deposit, would have a relationship with the central government. Some comparisons between the first Bank of the United States can be drawn with today's Federal Reserve Bank system, Both could control currency supply by the setting the amount of reserved moneys required to be held against which loans might be made or notes issued. In the period, the great fear of "paper money", or of an excessive supply of currency or bank notes produced by making loans or issuing notes in excess of what reserves were held, was one of the chief complaints of the anti-bank factions. In an 1833 diatribe against paper money, William Gouge prophesied that paper money would produce rampant inflation and devalued currency, which would spread until:

The circle extends through society. Multitudes become bankrupt, and a few successful speculators get possession of the earnings and savings of many of their frugal and industrious neighbors.⁸

On the other hand, banks were an absolute necessity for commerce and especially in the hinterlands, far from the money centers of the Eastern seaboard.⁹

New Orleans was not newly settled, nor a raw frontier, but it was the newest part of the United States and its trading area could largely qualify as wilderness. Thus, bank currency was a necessity. And, as the pattern set for the United States dictated, the formation of local banks would not be under control of the national government, but would be the prerogative of the State of Louisiana. Louisiana banking might even have a different look from that of the rest of the country. While the incoming American rulers could dictate that English would become an official language (while French was still in use), they could only overlay American culture on top of what previously existed. Americans might abhor public balls on Sundays, but they could not get the Creoles off the dance floor.

While banks could cause havoc through their expansion of available currency, regulation and strict control over available money could be seen as a cure for an unstable economy. Making money readily available might benefit the economy and encouraged growth. A traditional “moralistic picture” of banking and finance in this era could exaggerate the harm banks could cause, and not take into account how banks could have a positive effect on the economy.¹⁰

The state banking system of Louisiana in the nineteenth century can be taken as an example of how expansive banks, ready to lend, could bolster the local economy. A merchant or a planter, wanting to expand, would either have to self-finance expansion by use of savings or profits, or borrow funds from outside. A bank could channel to a borrower those outside funds, either from funds from their own investors, to whom bank stock was sold, and depositors, or from notes from other banks (borrowed money from those banks, in effect.) The bank could also lend out money it did not have -- that is, while the bank might have some gold coins, or

specie, in a vault, or it might hold notes on other banks as collateral, or might even hold mortgages on property, these might be all counted toward reserved funds, and loans in excess of reserves were possible because not all notes would be due at the same time and payments from current loans could add to reserves covering longer loans. Thus, there would always be more money in circulation than the sum total of money in the bank vault. This flow of money out of the banks as loans or notes and into the banks as deposits or notes from other banks was the system by which the economy was funded. Another layer of the Louisiana banking system was occupied by the factors: those who dealt with the planters by lending on planting costs and then marketing the resulting crop. Factors might also use banks, with profit taken at each step. Whatever the number of banks, or factors, an overriding interest of the State of Louisiana in setting regulations for a stable financial system was the regulation of a reserves to loan ratio, and defining the types of collateral that could be accepted as guarantees for loans.¹¹

The state itself could participate in a bank by buying stock in it, using it as a fiscal agent, and even by borrowing through it. Thus, the state had a vested interest in the banking system and, indeed, could not run a government without it. That the state would regulate banks was a foregone conclusion, but the method might vary.

There were three ways of creating a bank in nineteenth century Louisiana. First was the chartered bank, created by State Charter in a Legislative act and with its own articles of incorporation present in the legislative record. “Free banks” were also products of legislative action, but in this case they were all created after regulations for such banks had been set by the general free banking law passed by the Louisiana Legislature in 1853. The third type of bank was the private bank, which was not a corporation but either a partnership or had a sole

proprietor, and was regulated only by such state laws as covered financial transactions and interest rates.¹²

Louisiana banks also came in three varieties: first was the “property bank” which lent money on land or buildings and had a mortgage portfolio on which loans were made; second were the “improvement banks” which “financed, constructed and managed internal improvements such as canals, railroads, waterworks, and hotels;” and last were the “commercial banks” which provided merchants with short term credit. The banks would overlap in their services, and the “improvement banks” and “property banks” did not last in their original guise past the 1840s.¹³

In addition, the banks all operated within an international banking system which required that exchange rates for currency be set for fair values of conversion into gold or silver. Trade could not take place with only gold or silver accepted as payment for goods: there was too little of this “specie” available. On a local trade level, what little specie made into coins was supplemented by bank notes. Exchanges of funds for large transactions and international trade took place through relationship between banks in the countries involved. New Orleans, where sugar or cotton was regularly shipped for sale abroad, required banks with correspondent relationships abroad to support this trade. In essence, banks functioned so the planter could be paid for his crops, and he could then buy land and supplies, support local industry, buy slaves or hire workers, and patronize the complex local trade and financial system. Planters and merchants needed credit to function between crops or sales. They looked to banks for this credit. This complex trade and financial system also required a stable money supply, currency that was backed by specie and redeemable at a set value. The conflict between the need for ample credit

and the need for a stable money supply would cause the financial crises of the nineteenth century, in Louisiana and throughout the United States.¹⁴

While in the colonial era worthless paper money had been a problem from time to time, in the Spanish years there was still circulation of specie, gold and silver from the other colonies in the empire. New Orleans's economy had continued to function, even given the city's distance from other financial centers. Prior to the Louisiana Purchase the city could still claim some dependence on its European rulers. In the American era, that changed. The first United States Bank charter expired in 1811 and was not renewed. By that point, the territorial legislature in Louisiana, had chartered two banks: the Bank of Orleans, a conventional bank whose board resembled that of the closed United States Bank; and a short-lived Planters Bank designed to serve the needs of agriculture. The War of 1812 and the 1815 Battle of New Orleans wreaked havoc on the local economy with trade blockades and uncertainty about the future. The state government reacted first, by borrowing money from the Louisiana Bank (chartered 1804) and then by beginning plans for a Louisiana State Bank (chartered 1818 with \$2 million capital stock.) The second Bank of the United States opened a New Orleans branch in 1817.¹⁵

Through the next two decades, the financial system of New Orleans, tied to the vagaries of agriculture and epidemics and prey to the seismic disturbances of international economic crises, struggled along as local prosperity grew. And, as the city grew, its infrastructure needs demanded attention. With a financial system in place, and state and city governments woefully under funded, the only way to pay for public works construction was through the private financial sector, using as a method the chartering of a bank.

The first bank created as an "improvement bank" was the Canal Bank, chartered in 1831 with \$4 million capital with \$1 million of that allocated to building a canal from Lake

Pontchartrain into town to accommodate shallow draft trading vessels and barges. Lake Pontchartrain was accessible to the Gulf of Mexico through the Rigolets, and had access to the inland south through the seven rivers that drained into the lake. The project, the New Basin Canal, would augment the services of the old Spanish-era Carondelet Canal (or the Old Basin Canal) that ran from Bayou St. John to the edge of the Vieux Carré at Basin Street (where there had been a turning basin.) The New Basin Canal, 60 feet wide and 7 feet deep, was dug by hand in less than seven years and at great hardship to its immigrant Irish and German immigrant laborers, plagued by cholera and yellow fever. Its route is now followed by the Greater New Orleans Expressway as it connects with Interstate 10, and West End Boulevard, a divided thoroughfare whose inner section covers the New Basin Canal's path to the lake shore. Its great work successfully completed, the Canal Bank reorganized in 1870 and survived almost until World War II, failing only in the Great Depression.¹⁶

Other improvements came in addition to the canal. New Orleans by the end of the 1830s had the Pontchartrain Railroad (from the Mississippi River to Lake Pontchartrain along Elysian Fields Avenue) and the St. Charles streetcar line (along St. Charles Avenue up to what was then the City of Carrollton.) One thing the city did not have was a dependable water system. A steam pump system that brought Mississippi River water through the streets of the Vieux Carré through logs and cast iron pipes was installed before 1820 and was immediately inadequate. A modern water system was a large project: only a bank could accomplish it.

The Legislative Act "To incorporate the Commercial Bank of New Orleans" was signed April 1, 1833, by Governor A. B. Roman. As the Act said,

. . . sundry inhabitants of the City of New Orleans have petitioned this General Assembly, setting forth that they are desirous of establishing a Company in the City of New Orleans, invested with banking privileges, and to be entitled the 'Commercial Bank of New Orleans:' the chief object of which said Company, is

to be the conveying of water from the river into the City of New Orleans and its faubourgs and into the houses of its inhabitants.

. . . the said object will greatly contribute to the security of the said City from fire, and to the health and convenience of the inhabitants, and the agricultural and commercial interests of this State may be greatly promoted.¹⁷

The Commercial Bank had capital stock of \$3 million sold at \$100 per share. The city subscribed for 5,000 shares (valued at \$500,000) and in addition the city issued bonds to the bank at five per cent interest -- dividends earned by the city's stock would go into a fund to pay the bank's interest on the bonds, or the bank could discount the bonds and sell them elsewhere. This stock purchase and bond issuance allowed the city to finance an expenditure over a long period of time -- hence the organization of a bank for the building of a city waterworks. With the financial backing of the city, the bank would oversee and pay for the building of a water system, and profits from selling water would go to the bank, for at least thirty five years until the city bought the water system from the bank. Meanwhile, the bank could also make money as a financial institution -- taking in deposits and making loans and collecting a slight fee on transactions.

The Commercial Bank would have a thirteen member board of stockholders (two of them appointed by the Mayor and City Council), all U.S. citizens and Louisiana residents, who were elected by vote of "all stockholders, except females, minors, and persons under indict." This "corporation and body politic" was given all rights necessary so that it could have the "exclusive privilege" of

. . . supplying the city and inhabitants of New Orleans and its faubourgs, with water from the river Mississippi, by means of pipes or conduits, and for creating, constructing, or working of any necessary engines, and they may contract for, purchase, or lease, the right to enter and pass through, from time to time, as occasion may require, any lands or grounds through which they may deem it necessary to convey the said water into said city and its faubourgs and to construct, dig, or cause to be opened, any canals or trenches whatsoever, for the conducting of the water of the river from any place or places that they may deem

fit, and to raise or construct such dykes [sic] , mounds, or reservoirs, as they may judge proper, for securing and conveying such supply of water, as aforesaid, to the said city and the faubourgs thereof; and to survey such lands as they may think proper, in order to ascertain the best mode of furnishing such supply, and to lay and place any number of conduits, pipes, and aqueducts [sic], and to cleanse or repair the same through or over any of the lands or streets of the city of New Orleans and its faubourgs. . .¹⁸

The charter was granted with the proviso that, at the end of thirty five years, the city would have the right to purchase the waterworks. The charter of the Commercial Bank was, in effect, a thirty-five year franchise to supply the city with water. Construction of the waterworks (which must cost the company at least one hundred thousand dollars for each year of construction) must begin within one year of the charter being granted, and “be completed in the shortest time practicable.” The company pledged to supply water in the streets and, for a fee set by the company, allow citizens to “procure it by means of conduits or pipes,. within their houses and lots.” Profits made by the company should not exceed fifteen per cent net (after all expenses were considered) per year for the first five years, and ten per cent per year afterwards.¹⁹

Besides operating the water franchise, the company could behave as would any other commercial bank:

...said company shall have power to discount notes or bills, and may loan money on stock or others rights and credits, and on lands and slaves secured by mortgage, and buy and sell bills of exchange, and, generally, to transact any banking business.²⁰

Semi-annual dividends would be paid stockholders from profits, all employees of the bank had to be bonded, and the president was elected from and by the board members -- all the requirements for any commercial bank were to be met.

The bank also had some obligations to the city. The company had the right to use streets and public places for laying their pipes

Provided, they do not obstruct the said streets longer than will be absolutely necessary for the said purpose, or for making any repair; and *provided* they restore the said streets to the same condition they were in before, in as short a time as possible; that within the city limits, it shall not have power to place any pipe, or do any work upon any lot of ground, without the consent of the owner. .

²¹

If the owner could not be found, or was unwilling, the bank could resort to a complex legal method to get its pipes laid, similar to the doctrine of *eminent domain* whereby a government can declare its right to the use of land for the public good. The government would also punish those polluting the water system by operating “any tan yard, hog-stye, slaughter-house, dye-pot or otherwise” and send the offender to jail “for any time not exceeding seven years.”²²

In an exchange of favors between the bank and the city, tax abatement was balanced by free public water service. As the agreement said:

That the capital of the said Commercial Bank of New Orleans, shall be exempt from the payment of any tax imposed by the State, or by any parish or body politic, under the authority of the State, during the continuance of the charter of said company; in consideration of the advantages to be derived by the public, by the accomplishment of the object for which the said company is incorporated.²³

The “capital” that was free from taxation would be later have to be defined by court action.

The water service granted the city was set also:

... the Corporation of New Orleans shall be supplied by the said company, free of charge, with all water necessary for the extinguishment of fires and other public purposes, nor shall the city council be subjected to any charges for water furnished to supply the gutters of the said city and faubourgs: and that the said company, as they progress in laying acqueducts [*sic*], shall place, free of any charge whatever, two hydrants of a proper construction, in front of each square, at a suitable distance from each other, from which a sufficient quantity of water may be conveniently drawn, for extinguishing fires, for wetting, washing and watering the streets and gutters, and any other public purpose, that on the squares which do not front on the river, the hydrants shall be placed on opposite sides of the streets, at an equal distance from each other and the corners, that the said hydrants shall

be of a proper size and made so as at all times to furnish water for the fire engines, and purposes herein mentioned: it shall further be the duty of said company to . . . supply a sufficient quantity of clear pure and wholesome water for the use of the inhabitants within the limits aforesaid, at the elevation of fifteen feet when the same may be required.²⁴

The bank also agreed to buy from the city the pipes already in the ground, at an amount to be set by a committee of citizens. Its rights and duties set out by its charter, the bank and its directors set down to work. They would hire a German-born engineer, Albert Stein, and he would complete a waterworks within five years, with a giant reservoir covering a square block near the river and ample water pressure coursing through newly laid pipes. The water may have been relatively clear after settling in the reservoir, but it was not pure as we would demand today. Thus the bank fulfilled its goal of building a waterworks, and its corporation would hold the franchise until the thirty-five years had passed. As a banking institution it would fail long before that time.

It was not a foregone conclusion that such a bank would fail as a financial enterprise. The Manhattan Company, a bank organized specifically to build a water system in Manhattan, had been formed some years earlier in New York. With the support of both Aaron Burr and Alexander Hamilton (who were on opposing sides in all other matters political) the Manhattan Company had been chartered by the New York Legislature on April 2, 1799.²⁵

The Manhattan Company had exclusive water rights for supplying New York City, yet its efforts and expenditures on a water system were both ineffective and inadequate even while it flourished as a bank. Determined to solve the city's water problems in another way, the state legislature passed another act concerning the city's water in 1834 and authorized New York to begin building the giant Croton Aqueduct to bring fresh water to town (with New Orleans' Albert Stein hired as a consulting engineer at one point on the project.) After its exclusive water

rights were gone, the Manhattan Company continued to prosper as a bank -- and, as the Chase Manhattan Bank, would remain on the banking scene until the late twentieth Century.²⁶

Any connections between the Manhattan Company and the 34 years younger Commercial Bank of New Orleans are tenuous at best. The New York bank founder, Aaron Burr, would kill Alexander Hamilton in a duel. Burr then came to grief in a farfetched scheme to form another country west of the Mississippi and in this venture he certainly had some adherents in New Orleans. Ironically, the builder of New Orleans' first waterworks, Benjamin Latrobe, would credit his being awarded the contract to a conversation he had in Virginia with President Thomas Jefferson at Burr's 1807 trial for treason. If the Manhattan Company set any example for its New Orleans counterpart to follow, it was that any bank hoping for success must have an able, and politically adroit, board. In this the Commercial Bank would copy its example.²⁷

The first step toward setting up a bank, in 1830s Louisiana, was to have commissioners who would oversee the initial public offering of the stock.

The commissioners appointed by the State were W. G. Hewes, R. O. Pritchard, C. Genois, Wm. M. Beal and Joseph Saul. Commissioners appointed by the New Orleans City Council were Joshua Baldwin and Joseph Lallande. Genois and Lallande, judging by name alone, were from the primarily French speaking segment of local citizens.²⁸

When the bank had elected its first board and officers, the original commissioners were well represented, with only R. O. Pritchard having no immediately continuing affiliation with the bank. William G. Hewes became president, and the board members elected by stockholders included W. L. Robinson, Charles Genois, Charles De Blanc, William Bullitt, L. B. Arceuil, Joseph Lallande, A. L. M. Damarin, Hugh P. McKenna, Joshua Baldwin and W. M. Beal. Denis Prieur and Felix Labatut were appointed by the City Council to the board, Joseph Saul was

named Cashier, Branch W. Miller was the notary and C. M. Conrad was the bank's attorney. French surnames of bank principals included Genois, De Blanc, Arceuil, Lallande, Prieur and Labatut.²⁹

Hewes was a native of Boston and had come to New Orleans in 1818 and "embarked largely in commercial pursuits," according to his 1862 obituary, which added::

"Throughout his somewhat checkered life as a merchant, he exhibited and maintained all the characteristics of an upright and honorable merchant, and as such he was respected and beloved by all who had the good fortune to make his acquaintance. As a patriotic and good citizen he stood with the highest, For a third of a century he was devoted to active commercial pursuits, and no one connected with the trade and commerce of New Orleans was better known or stood higher in the commercial circles of the North, particularly Boston and the New England States.... For several years he was President of the Commercial Bank of this city..."³⁰

Hewes was an experienced merchant and factor, and was an ideal choice to run the bank. The political arm of the board included two aldermen, Felix Lallande (2nd District) and Joseph Labatut (6th District), and, most importantly, the current Mayor in 1833, Denis Prieur, who would serve until 1838. Charles Genois, another board member, succeeded Prieur as Mayor from 1838, after which Prieur returned to serve until 1843. Thus, while the Commercial Bank existed as a financial institution, it had the Mayor of the city on its board of directors.³¹

Perhaps fittingly, in light of its propensity for litigation, the most eminent personage affiliated with the Commercial Bank was its first attorney. Charles Magill Conrad died in 1878, and according to his obituary he was born in Winchester, Virginia and brought to New Orleans as a child in 1804. In the beginning of his political career he was a state legislator, and served as Louisiana's Attorney General. He then served in Congress for Louisiana, both in the House of Representatives and as a U.S. Senator, and he was Secretary of War under President Millard Fillmore. He also served in the Congress of the Confederate States of America when Louisiana

seceded from the Union. Even Conrad's family connections were first rate: his wife was the great-niece of President George Washington.³²

The Commercial Bank had auspicious beginnings. Their board was well chosen, they were sufficiently capitalized, and the local economy was flourishing. The 1830s began as a decade of growth and prosperity for New Orleans. Proof of that boom exists today. More of the buildings still extant in the Vieux Carre in the early twenty-first century were built in the 1830s than in any other single decade since the city was founded.³³

The reasons why the Louisiana economy experienced a tremendous surge in the 1830s were varied. In the 1830s the cotton output ballooned as new lands, extraordinarily fertile in the first years of cultivation of this nutrient-depleting crop, were opened for cotton plantations. Trade through the port increased. Sugar production, always cost intensive because of the need to add value to the crop by refining, held steady. And a pent up hunger for credit, left from the 1820s, was satisfied when the Louisiana Legislature went on a bank-creating binge. Fourteen banks were created between 1831 and 1836, while only three banks had been formed in the 1820s, and two in each of the two decades before then. More banks meant more credit, and more mortgages, thus the amount of 1830s building construction in the Vieux Carre becomes understandable.³⁴

As Louisiana business was booming, the American economy was also expanding. That would come to an abrupt end. First, the price of cotton fell. Then, in 1837, due to a combination of factors, both political (President Andrew Jackson's administration's anti-bank views wanted money based on specie rather than on bank notes), and international (British investors and institutions stopped investing in American enterprises in an effort to reform the international

monetary system and in reaction to Jackson's actions) the system collapsed. The starting point of collapse was when

. . . early in March, 1837, an important firm [*of cotton factors*] in New Orleans, Herman Briggs and Company, failed, being unable to realize enough from the sale of their cotton [*to agents for English mills*] to pay the obligations they had incurred in purchasing it [*from Louisiana planters*].³⁵

The depression that followed as the money markets re-arranged themselves is usually referred to as the "Panic" of 1837. Under whatever name, the financial collapse in Louisiana ran from 1837 to at least 1843, with passage of a strict 1842 Louisiana banking law customarily taken as the final phase.³⁶

The financial collapse was felt not just systemically, but on a personal level as well. When Commercial Bank President Hughes died thirty five years later, his obituary noted that "Following the great commercial revulsion of 1837, 1842, he met with reverses, and partially withdrew from active mercantile pursuits." Happily, he rose again to be president of the Great Western and Opelousas Railroad and became a prosperous sugar farmer and factor before his death at age seventy.³⁷

Doubtless the freedom with which banks were extending credit bore much blame for the economic collapse. But, besides removing numerous weaker players from the local financial game (nine of the fourteen Louisiana banks chartered in the 1830s had liquidated by 1847), the crisis permanently moved financial decision-making from New Orleans to New York and eastern banking centers, and its aftermath forever changed the way the Federal Government handled its moneys. Cotton, as a commodity, would retain its importance. In fact, Nicholas Biddle, whose second Bank of the United States fell victim in 1836 to Andrew Jackson's insistence on stronger currency and higher specie requirements, speculated in cotton for his resurrected bank, known as the United States Bank of Pennsylvania. Biddle was certainly a creative financier, but politically

the Jacksonians were stronger. The Jackson local political faction, with Orleanian John Slidell making recommendations, had suggested the Commercial Bank (then in its infancy) as a repository for federal funds. In fact, federal funds on deposit had fueled much Louisiana banking activity in the 1830s. When Jackson forced all banks to return federal funds to Washington as soon as possible (in effect, this is what his insistence on high specie reserves meant) the New Orleans banks were drained. The Commercial Bank was unable to fully recover from being forced to liquidate its portfolio so abruptly, and by 1843 it had ceased operations.³⁸

The Louisiana Banking Act of 1842 was designed to reform the state banking system. It allowed banks to issue short term loans only, although it could acquire long-term assets equal to its capital, that is, the liabilities of its shareholders. As succinctly described by Hammond, who looked on it favorably,³⁹

Edmond J. Forstall, a New Orleans banker and agent of Baring Brothers, an English bank, was chairman of the legislative committee writing the 1842 act, drawing on prior writings on banking and his own experience as a banker. The legislation itself was a cooperative effort with contributions from other legislators included -- in fact, the bill was first vetoed by the Governor until presented in a modified form. It provided stricter regulation on reserves, limited the types of loans banks could make, and, most importantly, acted on the banking system of the state as a system -- stronger banks would absorb obligations of weaker banks in a sort of deposit insurance scheme without government backing. Even many of the stronger banks could not continue to exist under this proviso.⁴⁰

While the Bank Act of 1842 set out to solve the financial crisis by strictly reforming banks, the fact that the State of Louisiana was itself in debt made the solution more difficult.

Much of the burden of eliminating the state's debt fell on the banks, and they suffered and failed accordingly. Banks had few friends among the politically powerful in Louisiana in the 1840s. While in some eyes this might be judged reformist and progressive, anti-bank political factions would go so far as to virtually outlaw organization of any new Louisiana banks in the 1845 State Constitution. By that time most of the banks in the state were already in liquidation. Not until 1853 would Louisiana monetary policy toward banks soften, with the passage of the "Free Bank Law", allowing new banks to organize under existing finance laws and not requiring them to have a specific state charter. One of the reasons for the change of attitude was that it became obvious that infrastructure needs could only be met by a vibrant financial system that offered credit for building projects essential to the public. Fortunately, by that time the Commercial Bank already had its waterworks constructed and functioning, even if its role as a bank had ceased.⁴¹

The Commercial Bank ceased its banking operations and was tending to its waterworks, but it often availed itself of the court system, often seemingly in an effort to simply increase its net worth or cut its expenses. Its suit against its own waterworks engineer, Albert Stein, sought \$40,000 in recompense for the plans and drawings they alleged he had taken, and it could be assumed from the court records that the bank saw an opportunity to somehow profit when Stein left its employ -- certainly profits were hard to come by in the 1838-43 period.⁴²

Some litigation might have resulted from a political feud. In an 1835 case before the Louisiana Supreme Court, the two directors appointed to the bank's board by the City Council, Denis Prieur and Felix Labatut, protested that they had not been allowed to vote when a vacancy occurred within the stockholder-appointed eleven directors. They sued for the right to vote for

replacement directors and \$400 in damages. They won in district court and the Supreme Court upheld the decision.⁴³

The bank's other litigation mostly was concerned with collection of debts, or fine points of proceedings on how notes might be redeemed. The bank did win a case against the City of New Orleans which was seeking compound interest on its stock shares (interest was to be held in a fund to go against the interest on the city bonds.) The Supreme Court ruled that only the earned interest kept in a fund would earn any interest, not the interest added to the stock value.⁴⁴

The Supreme Court also insisted, siding with the City of New Orleans in January of 1848, that the bank, which had long since liquidated its banking business, should pay the interest it owed on the city bonds as its charter required before dividends were paid to stockholders.⁴⁵

In one series of cases, however, the bank tried mightily in the courts to save money by avoiding paying taxes.

In its original charter, the Commercial Bank of New Orleans was given the privilege of not paying any taxes on the capital of the bank -- in return for its completing the waterworks. The bank quibbled, however, on how capital was defined. In June of 1843 the Second Municipality of New Orleans took the bank to court to collect taxes on real estate and slaves owned by the bank. The bank claimed that this was capital and not subject to taxation. The Supreme Court ruled that Nothing is exempted from taxation, but the capital of the bank, to wit: a sum of three millions furnished by the stockholders for its operations.. It had no right to withdraw from taxation property, which, before it acquired it, was liable to taxation, in the hands of its former owners.⁴⁶

If they had no redress from the judges, the bank would try politicians. In a lengthy 1852 “Memorial of the Commercial Bank of New Orleans” the bank addressed the members of the Louisiana Legislature, setting forth in a booklet their arguments as to why they should be able to claim all the bank’s property (including slaves and real estate, even real estate seized for non-payment of debts) as capital not subject to taxation.⁴⁷

The Legislature responded, and on March 17, 1852, passed an Act allowing the Commercial Bank to claim all its property as tax exempt, citing Article 123 of the 1845 Louisiana State Constitution which allowed the Legislature to exempt any property it liked from taxation. The city sued to collect taxes and won. But, when the bank appealed that decision to the highest court in the state, they won. The Louisiana Supreme Court had little recourse but to accept the legislative action and deny the city its taxes. Noting that the Commercial Bank’s waterworks was supposed to be awarded tax exempt status for supplying free water to all charitable institutions in the city, the court ruefully pointed out that charitable institutions not being supplied could certainly sue the bank. In effect, playing the political card in state government had trumped the local government in the game of tax collection.⁴⁸

The Commercial Bank of New Orleans, no longer serving as a bank, still functioned as a corporation and would continue to exist until its water franchise expired in 1868, by which time the financial state of Reconstruction Louisiana would be more troubled and far different from the heady days of the ebullient 1830s, when credit was ample and creating a new bank was seen as the best way to get an important municipal project accomplished.

End Notes

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⁴ W. J. Rorabaugh, The Alcoholic Republic: An American Tradition (New York: Oxford University Press, 1979), 1- 81.

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¹² Green 15-16.

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- 26 Koeppel, 155-169, 322.
- 27 Koeppel, 169 ff. ; John C. Van Horne, ed .The Correspondence and Miscellaneous Papers of Benjamin Henry Latrobe, Vol, 3, 1811-1820, Series IV of The Papers of Benjamin Henry Latrobe, Edward C. Carter II, Editor in Chief. (New Haven: for the Maryland Historical Society by Yale University Press, 1986, 119. Latrobe would write a letter on August 11, 1811, saying that "Mr. Jefferson was the first who by desire I believe of [Governor William] Claiborne, asked my opinion on the subject, during the business of Burr's trial at Richmond [summer of 1807.]".
- 28 New Orleans Bee, May 4, 1833, 1.
- 29 _____ Michel's New Orleans Annual and Commercial Register for 1834, New Orleans: Gaux and Sollee, Printers, December, 1833), p 240. Beal is incorrectly listed as "U.M. Beal" in this directory.
- 30 Daily Picayune, September 23, 1862. p 1.
- 31 Leonard V. Huber, New Orleans: A Pictorial History (New York: Crown Publishers, 1971) p 7; _____ New Orleans Conseil de Ville Ordinances and Resolutions, 1832.
- 32 Daily Picayune, February 12, 1878, 4.
- 33 Richard Campanella, "A Geographer Looks at the French Quarter", address given before the Louisiana Historical Society, New Orleans, November 10, 2003. Campanella, a geographer at Tulane University, created a bar chart showing dates of construction by decade for some 2000 buildings in the confines of the Vieux Carre, and the number for 1830s construction far outnumbered that of other decades. The chart applies to existing buildings only. His work will be published in book form, as yet untitled.

³⁴ Green, pp 22-23. Banks formed for the first time) in the 1830s included the City Bank of New Orleans 1831), Canal Bank 1831), Union Bank of Louisiana 1832), Citizens Bank of Louisiana 1833), Clinton & Port Hudson Railroad Company 1833), Mechanics & Traders Bank 1833), Commercial Bank of New Orleans 1833), Atchafalaya Railroad & Banking Company 1835), New Orleans & Carrollton Railroad & Banking Company 1835), New Orleans Gas Light & Banking Company 1835), Exchange & Banking Company 1835), New Orleans Improvement & Banking Company 1836), Merchants Bank of New Orleans 1836), and Pontchartrain Railroad & Banking Company 1836).

³⁵ Hammond, 459.

³⁶ Hammond, 764, 768.

³⁷ Daily Picayune, September 23, 1862. 1.

³⁸ Green, 99-101.

³⁹ Hammond, 680.

⁴⁰ Green, 118-129.

⁴¹ Green, 129-145.

⁴² Commercial Bank of New Orleans v. Albert Stein, Docket #3691, Supreme Court of Louisiana Archives, Department of Manuscripts and Archives, Earl K. Long Library, University of New Orleans.

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⁴⁴ The Mayor, Aldermen and Inhabitants of the City of New Orleans c. v. the Commercial Bank of New Orleans, Docket #4561, (Supreme Court of Louisiana Archives, Department of Manuscripts and Archives, Earl K. Long Library, University of New Orleans. 5 Rob. 234.)

⁴⁵ City of New Orleans v. the Commercial Bank of New Orleans, Docket #617, (Supreme Court of Louisiana Archives, Department of Manuscripts and Archives, Earl K. Long Library, University of New Orleans. 3 La. Ann. 96.)

⁴⁶ The Second Municipality of New Orleans v. The Commercial Bank of New Orleans, June, 1843, (Supreme Court of Louisiana Archives, Department of Manuscripts and Archives, Earl K. Long Library, University of New Orleans. 5 Rob. 151)

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Chapter 5: Bricks and Mortar: Albert Stein's Reservoir, 1835

As the American economy cycled from boom to bust in the early decades of the nineteenth century, the urban centers of the country went through ups and downs as populations grew and the needs of cities became more clearly defined.

On the one hand, national politics in the second quarter of the century became progressively more divisive as Jacksonian democracy gave more voice to the common man. Even on the level of city government there were differing philosophies on how needs might be met and cities governed. On the other hand, the private sector was dealing with changes in the financial structure of the economy and flaws in a banking system which struggled to create stability in the monetary supply. Those flaws would culminate in the Panic of 1837, but the struggles in the years before had other consequences. In New Orleans, one result was that banks were created whose sole purpose was to finance and run infrastructure. The Canal Bank undertook to dig a new cargo canal route to Lake Pontchartrain. The Commercial Bank was formed to build a new water-works. These improvement banks took on the responsibility of providing civic services, with the idea that the possibility of profit would encourage investment and actually produce results, and that the private sector would somehow accomplish goals more efficiently than elected officials might. In return, government would invest its own funds in the project, as in a bank, and would agree that private investors would have support in collecting payment for use of their services by the population.

In practice, the improvement bank method put decision making power into the hands of private citizens, most of whom were put into their positions because of their own financial standing. Bank boards included both shareholding investors and political appointees, and while

differing factions in power could hold or lose the majority of members voting, members were all deemed fit for inclusion because they already had financial clout because of personal holdings or political muscle. The improvement bank board, while in place because of financial and political reasons, had the added power of choosing the method of accomplishing the stated project.

The Commercial Bank, therefore, was put in the position of selecting the best method of constructing the waterworks they were charged with completing. In making that choice, the power of the voting board was used to make a technical, a scientific, decision rather than a strictly financial one. What was the best method to construct and run a water-works? In New Orleans, the question was settled when an engineer, Albert Stein, presented a plan and was chosen to head the project. Stein made his proposal, was hired, accomplished his goal and prepared to leave. In a twist of fate, the Commercial Bank then turned on Stein, accusing him of stealing what they claimed were essential documents necessary for carrying on the water-works project he had just successfully completed. It was as if a magician who had performed a seemingly miraculous trick was decried for not telling his secret methods to the audience when he finished. Stein, in turn, protested against the accusation, reacting as if he were somehow protecting his own intellectual property. The drama of Albert Stein and the Commercial Bank provides a picture of the struggles between the forces of political and financial power versus the science and technology of the age in the person of the professional whose clout came from personal knowledge and expertise. Thus, the need for professional technicians was recognized long before the Progressive era later in the century. The struggles between such professionals and those with the power to hire them was also in evidence early.

On Monday, June 25, 1838, a warrant was issued by the Judge of the First District Court of Louisiana for the arrest of Albert Stein, a Civil Engineer and resident of New Orleans, a

respected authority on waterworks and a native of Prussia whose career in America had brought him renown and a comfortable living. Stein was not charged with a crime, he was being sued by his former employer, and his resulting legal problems would wend their way up to the Supreme Court of Louisiana during the following years. In the case, *Commercial Bank of New Orleans v. Albert Stein*, the bank contended that Stein had not turned over relevant documents and items on his resignation as superintendent of the New Orleans Waterworks, which the bank had been chartered to construct and operate. Those items were worth \$40,000 to them, according to the bank. Stein's answer, filed June 28, 1838, denied the allegations and further denied that he was "indebted in any manner or liable" to the plaintiff or that the plaintiff had "any such cause of action against him." Consideration of the case provides not only a narrative of a civil action, but an absorbing glimpse into the commercial milieu in which the infrastructure of an American city was created in the early part of the nineteenth century. Moreover, the portrait that emerges of Stein depicts a professional man of science, proud of his craft and ready to defend what he saw as his intellectual property.¹

Judge A. M. Buchanan of the First District Court of Louisiana, which served the six parishes of Orleans, Jefferson, Plaquemines, St. Bernard, St. Charles and St. John, signed the arrest warrant that Monday, ordering Sheriff Frederick Buisson "to arrest the body of the defendant Albert Stein and him confine till he shall give sufficient security that he shall not depart from said state without the leave of the said Court." This was not a pleasant way to begin the week, but by Thursday the warrant had been returned and Stein's freedom was secured. To be free on bond, Stein found two upstanding citizens, the attorney M. W. Hoffman and the grocer J. W. Justamond, also ranked as a Brigadier General in the Louisiana Militia, who pledged \$50,000 assuring that Stein would remain available to the Court. Indeed, Stein remained

in New Orleans for some time: the District Court trial would not begin until March 17, 1839, a little more than five years from the day he had undertaken the New Orleans waterworks project.²

Stein had officially begun working on the New Orleans waterworks November 23, 1833, just two days after his marriage in Nashville to Caroline Troost. The Bank's board of directors passed a resolution approving his terms of employment December ninth (Stein's forty-eighth birthday), and he signed a contract with the Commercial Bank's waterworks committee on December 23, 1833. In return for superintending the construction and operating the works, he would be paid \$6,000 a year. Either party could revoke the contract with a month's notice. Because he was "unacclimated," Stein was not required to stay in the city from June to November, or until any epidemics had passed each year. Since both Benjamin Latrobe, designer of the first city waterworks and his architect son had died of yellow fever contracted in the city, Stein had reason to be wary of spending the hot months in town. During that period the bank might compel him to travel within "the limits of the United States" on behalf of the project (perhaps on buying trips for pipes and pump machinery) for which his expenses would be defrayed. It was made clear that he worked under supervision of the waterworks committee and the bank's board.³

Stein's job description was exact: he was appointed civil engineer of the project, he was to "labour assiduously" and "devote his whole time and all the skill and knowledge he possesses to the proper discharge " of his duties, and "particularly to prepare and furnish...all plans, drafts and estimates" to the bank's waterworks committee. He was to work "with the assistance and under the control of said committee" and "to give them all needful information and the aid of his skill and knowledge."⁴

Stein had an abundance of skill and knowledge. Born in Prussia in 1785, he was educated as a civil engineer and in 1807 he was appointed a hydraulic engineer in the German Duchy of Berg and Cleves, then under control of Napoleon I. After the fall of Napoleon, he immigrated to America in 1816, settling first in Philadelphia where he knew Frederic Graff, engineer for that city's waterworks, and also a confidante of Benjamin Latrobe. Stein sought American work. He made surveys for an Ohio canal and submitted a design for waterworks in Cincinnati in 1817, subsequently building it. During the 1820's he worked deepening the Appomattox River at Petersburg, Virginia, and served as engineer of the Lynchburg waterworks. In 1832 he designed and built waterworks for Richmond, Virginia, that provided a technological first for the country: Stein built a filtration system. In Stein's Richmond system a reservoir held water in four pens, and in two of them water entered from the bottom and percolated up through gravel and sand to provide "an abundant supply of pure and sweet water for our city" according to a Richmond Watering Committee report of February 17, 1832. The upward filtration system proved unsuccessful and the system was augmented in later years, but Stein had provided the first filtered water to an American city, and he had brought the project in under budget: \$92,600 was estimated, \$76,861 was spent. Stein earned \$6,500 for his Richmond efforts, and at the same period he was designing a system for Nashville. Only 44 American cities had waterworks in 1830 and Stein alone was rapidly increasing that number.⁵

New Orleans, whose 1822 waterworks, designed by the same Benjamin Latrobe who built the Philadelphia system, consisted solely of a pump pulling Mississippi River water through pipes along French Quarter streets, badly needed a dependable municipal water supply. The earliest city, the French Quarter, was expanding both up and down the river as suburbs were created from old plantation lands. By 1840 there would be a street railroad connecting the city to

the upriver community of Carrollton and encouraging development along St. Charles Avenue. The city was becoming more industrialized, and the port was expanding. In 1833 the Louisiana Legislature chartered a private corporation, the Commercial Bank of New Orleans, with the aim of building and operating a waterworks. This charter gave a 35 year monopoly of water service, with a fifteen percent profit on gross returns for the first five years, ten per cent afterwards.⁶

The Commercial Bank's Water Works Committee published a report on February 18, 1836 and described in glowing terms its projected success at its venture. Although the charter required only that water be supplied at 15 feet of pressure, the new system would supply 21 feet of pressure. The requirements of the charter had actually been met at \$36,000 less than the projected \$400,000 cost. The reason for this miraculous achievement? "...Upon Mr. Albert Stein rests the responsibility" the report stated. "... The honor of having planned and executed in so short a time a work of so much difficulty and importance will be exclusively his."⁷

The report was signed by William G. Hewes Chairman, Maunsel White and Felix Labatut as committee members. Most likely the report was actually written by Stein, who, throughout his career, was the author of numerous articles in DeBow's Review, and of several pamphlets printed at his own expense. The committee was composed of three members: the President of the Bank (Hewes), and two other members of the bank's board, one of whom had to have been appointed to his position by the City of New Orleans. Both White and Labatut were still listed on the bank's board in the City Directory for 1838, but at that time the Water Works Committee was listed as Hewes, White and T. O. Meux, Meux being one of the City's two representatives to the board at that time. When Stein was hired in 1833 Joshua Baldwin and C. Genois served with Labatut on the Water Works Committee. The waterworks would go into operation on April 28,

1836, when water was pumped into the reservoir and the system went to work. All was successful.⁸

In 1836, the committee heaped praise on Stein. The public reacted with gratitude to the new water supply. Were there any signs to be discerned of the acrimony to come between the bank and the engineer? It may be that the entire project had been a troublesome one from the beginning. The committee's (or Stein's) February, 1836, report seemed to have been an attempt to assuage complaints. "The great difference of opinion which existed . . . as to the best mode" to elevate the water supply had been the first controversy even before Stein was hired. Should it be a 100 foot tall iron cistern? Should the pipes themselves run 15 feet in the air? The committee itself decided not to speak up for one system or another. Furthermore, since "there was not a single member of the Board practically acquainted with the subject of Water Works that had we not had an engineer among us... the difficulties... were considered by many intelligent persons as unsuperable." And so, "it was therefore decided that the first step should not be taken until the services of an engineer of the highest character could be procured," the report noted. If Stein were the writer, he was not shy about touting his own best qualities.⁹

Stein would advocate constructing a huge earthen mound on a square bounded by Richards, Market, and Religious Streets, just blocks from the river and a little over a mile upriver from Canal Street. The mound, built with mud from the river batture, would rise 21 feet and be topped by a brick reservoir measuring 250 feet square on the inside, and with its twelve foot deep interior plastered with cement. The top level of the water would actually be 38 feet higher than the level of Canal Street. The bank also purchased land near the river at Tchoupitoulas and Richard Streets to house the pumps, which pulled in river water through a 16 inch wide suction

pipe 800 feet long. The same width pipe fed the reservoir's four compartments, with a capacity of four million gallons.¹⁰

The project was an engineering feat, but was not accomplished without problems. "The settlement of disputes and difficulties . . . have occupied much time and caused much trouble," the report admitted, although "this . . . would have been ten-fold had it not been for the great exactness and economy of the engineer." Indeed, the four year project was finished in less than two years, and, with original specifications, was less expensive than had been thought. The bank's report is careful to point out how prudent their methods were: "The utmost exactness had been observed in regard to the expenditures. The bills are carried to appropriate accounts, so as to show the exact cost Each bill must be approved by the engineer and by the Water Works Committee." Moreover, the bank had been so careful in its budgeting they assured the public "that the Bank will be able to furnish water clear and pure at a much less expense" than the present system. The water supply for New Orleans in 1836 would have included that from cisterns, wells, water sold from carts, and river water pumped from the Mississippi through Latrobe's system's pipes along streets of the French Quarter, with plugs at corners where local householders fetched water.¹¹

After all that positive discourse on the waterworks theme, the report closed on a somewhat rueful note:

That this plan is the best that could have been adopted, and indeed the only one likely to have succeeded, we have no doubts -- that it *is* [sic] doubted by some, we do not deny; but the objections have been candidly examined...¹²

The objections, for the moment, may have been satisfied. In the month following Stein's resignation at the beginning of May of 1838 the atmosphere became far less congenial. Stein's letter confirming his resignation was sent May 9, and a letter from Stein on that date is Exhibit 2

in the court records. In that letter, Stein wrote the Board and President of the Bank confirming his "verbal notice I gave the President before the first of April" to "terminate said contract on the 30th day of April." Apparently he did not notify them in writing before the fact of his resignation, which may not have been taken lightly.¹³

On May 10, the bank board met and accepted Stein's resignation. On May 14, the bank sent a letter to Stein telling him "to hand over to the water works committee all the papers and documents in your possession in relation to your office." Stein let the bank know in no uncertain terms that he felt he had already given them everything. President Hewes wrote Stein on May 25 telling him to turn over all waterworks documents to the bank, Stein replied on the 27th that he wanted them to list exactly what they wanted since he felt he had turned over everything.¹⁴

The bank replied on the 27th with a list of eleven items they wanted: 1. a book listing all pipes laid to private families by January 1, 1838; 2. a book of invoices for all pipes and materials; 3. an inventory of all pipes in hand; 4. list of all pipes ordered not yet delivered; 5. street map showing pipes laid; 6. book with data on supplies and labor used in laying pipes in each street; 7. books to be balanced to date of Stein's resignation; 8. disclosure of where a deposit of \$1,300 meant for his engineering account went; 9. account for office furniture and supplies in Stein's possession paid for by the bank; 10. bills of lading for pipes in shipment from Philadelphia; and 11. a demand for explanation of a certain \$6,800 bank expense.¹⁵

Stein wrote the bank board on June 1, answering each item: 1. he would transcribe a new copy for them, the original book contained other personal material, too; 2. the bank had the originals, Stein had only copies; 3. he already furnished this, and the "rules and regulations" the bank adhered to did not require him to do so; 4. he had turned over everything he had, if more arrived he would send them also; 5. this book was ready to be handed over; 6. he knows of no

such book; 7. the bank's own officers balanced the books; 8. calling the \$1,300 amount "loose and inaccurate" Stein suspected this was a misreading of a \$1,429 payment from the Second Municipality for the paving of sidewalks; 9. all office furniture has been accounted for, he recalled a \$10 grate which may have been lost and he would pay for; 10. President Hewes directed him to order some pipes, a list of four items was attached; 11. referred to answer seven (the bank's officers balanced the books).¹⁶

In subsequent correspondence, the bank continued to demand the same items, not accepting Stein's explanations. The haggling over eleven items specified by the bank, including account books, maps and charts, and various other records, went on until the suit was filed June 25. By that time Commercial Bank President William G. Hewes' affidavit may have stated that he had "no intention of vexing" Stein by suing him and having him arrested, but it is hardly likely Stein could have felt otherwise than peeved.¹⁷

In a remarkable letter apparently written May 27, 1838, Stein spoke out in defense of what he saw as his own intellectual property that the bank was demanding of him:

If in the execution of said work I have found it convenient to write books or keep memoranda or to draw plans or to construct theories or to deduce demonstrative notions on hydraulics from my daily experience in a science which has employed my life and supplied me my bread, if after collating & perfecting in New Orleans the judgments of science I have tested at different places, I have gathered them into any referring system & have embodied them in my private papers, preserved in my private study I shall hardly consent to surrender them under the sweeping demands of the President for everything relative to the water works nor can I suppose that any deliberate demand to that extent will be direct by authority of the Board.¹⁸

The exchanges in the correspondence grew increasingly more heated. At one point, bank cashier George Hall wrote "it is hardly to be expected that the committee . . . should be able to describe minutely [sic] all these documents and plans." In particular, the bank wanted the

sketches showing where the pipes were laid, and, in addition, the bank demanded the original "dry point drawings which Mr. Stein thought it requisite and necessary to have drawn." Stein may have thought he was complying by handing over relevant items. The bank, however, thought so little of his compliance that a note in the trial records says succinctly:

The preceding is a List of all the papers sent to the office of the Commercial Bank and Water Works by Mr. A. Stein at the time of his resignation and most of them are of very little use or value.
F. M. Scott, Secretary¹⁹

Although the suit was filed June 25, 1838, the trial would not get underway until the following March 17. Perhaps the most effective witness was J.P. Coulon, whose prior employment was "of the sea," but who, nevertheless, was employed by the bank as secretary of the water works, and was also paid by Stein to serve as the engineer in his absence. Coulon was asked specifically about a plan book showing where pipes were laid. He admitted he had seen such a book at Stein's house where several people, including a Mr. Trollope, a Mr. Mollhausen, and a Mr. Troost, probably Stein's brother-in-law, were employed in drawing plans. The picture that emerges of Stein's method of operation is one of more autonomy than might have been expected. Although the Commercial Bank funded the waterworks project, they turned over complete management and direction of it to Stein, including setting up a bank account from which he himself paid wages, invoices, land costs, etc., rather than the bank paying directly. Other than oversight by the committee, Stein apparently had complete freedom to proceed as he saw fit. This included working out of his own home, which had been built as part of the waterworks project and stood on Tchoupitoulas Street near the pump engine house.²⁰

Coulon said he believed that any expenses the bank would suffer for not having such a plan book would be "about eight or ten thousand dollars." A plan of that sort would be worth "about fifteen hundred dollars," he said.

Other witnesses stated they had seen various plans and books in the waterworks office, showing "how far from the banquet [sic] those pipes ran" and other location guides. One witness, L. J. Rogers, recounted how he had seen pipes "strewn all over the streets and no one to

stand guard over them," presumably in evidence of Stein's poor management. Other witnesses included John Lathem, who had to be deposed separately as he "worked on the river," and John Swainson, an engineer "who served an apprenticeship in England." Witnesses were asked whether they could read Stein's plans as shown in court and most could. Witnesses even sometimes defined items discussed. "the fire plug is like a post on the sidewalk exposed to view," and "a stop cock is an iron grating in the street, visible to any person and indicates the position of the branches."²¹

In the course of the trial in District Court some thirty exhibits were offered, including a street plan showing pipe locations. The bank's witnesses insisted there had been a bigger, better plan and Stein had not turned it over. Stein's side insisted the bank had everything it required. Stein's attorneys filed a Bill of Exception on March 20, 1839, arguing that the Bank may have complained at not having a plan showing where pipes were laid, but their petition did not demand they be paid damages for costs incurred for lacking such a plan. And, the petition had only insisted they be given the plan or paid its "value in money." Furthermore, they suffered no such damages anyway. Judge Buchanan overruled them, and the case went to the jury.

The jury returned a verdict March 25. The bank won. The verdict ordered Stein to give the bank five items: (1) a large city map showing pipe locations and sizes, (2) a plan book showing the exact position of pipes and apparatus in each street, (3) an invoice book recording all pipe purchases and contracts up to April 30, 1838, (4) an inventory of all pipes on hand as of that date and (5) an account of all pipes laid to that time. If the items were not given the bank by Stein, he would be "condemned to pay unto the said plaintiffs the Commercial Bank of New Orleans the sum of eight thousand dollars." Stein also had to pay court costs of \$187.37 1/2.²²

On April 6 Stein's attorneys, Grymes, Harrison and Hoffman, were back in court asking for a hearing on a new trial. The plaintiffs' attorneys, C. M. Conrad and Connor, spoke against it. Finally, on April 24, Judge Buchanan refused a new trial. Stein filed for a petition for appeal to the Supreme Court of Louisiana on May 2. Reason for the appeal that a new trial be granted was "error in the final judgment rendered against him." Stein, with the aid of Christopher

Adams and John Bach, posted a twelve thousand five hundred dollar bond and the appeal was granted.

The appeal was filed with the Supreme Court March 16, 1841. According to the court minutes of March 7, 1843, the justices seated to hear the case included Francois Xavier Martin, Henry Adams Bullard, Alonzo Morphy, Edward Simon and Rice Garland. Judgment was rendered March 20, 1843. The Court granted Stein a new trial, set aside the verdict, and, in an opinion written by F. X. Martin, presiding judge, found error in that

the Jury . . . neglected to divide the sum which the defendant should pay, in case he did not deliver the five articles aforesaid, into five sums, one of which the defendant should pay in case he failed to deliver one or more of the said five articles.

The Supreme Court judgment also noted that some of the articles mentioned as being retained by Stein seemed actually to have been used by the bank as evidence in the trial, and, it was never shown that the large plan was ever completed or even that it ever existed.²³

And here, March 20, 1843, the records end. There is nothing in the First District Court records to show that a new trial was held, nor was there anything further recorded in the minute books for First District Court on the matter of Commercial Bank of New Orleans v. Albert Stein. Because the court records include a copy of a street map with colored lines showing where pipes were laid, and an engraving or etching showing an elevation of the reservoir, it is possible that Stein was able to satisfy at least some of the requirements. Perhaps a settlement was reached out of court.

Stein continued an active life in New Orleans. In the period from 1838 to 1840 he served as a city engineer, and also as an engineer for the Canal Bank, from which position he oversaw completion of the New Basin Canal.

The New Orleans of the 1830s was very much a modern city of its time: there was a governmental structure, a financial system, a legal system, and sophisticated merchants,

politicians and engineers squabbling over infrastructure and spoils. But, not every nineteenth century metropolis in the United States had progressed this far. While New Orleans already had preeminence as a major port and prided itself on its civic accomplishments (including banking on a new waterworks and digging an impressive canal), what would become the major city in the nation's heartland was just beginning to emerge from the vast wilderness.

Chicago as late as 1833 was "inhospitable," sited in a boggy marsh between the empty vastness of the prairies and the unwelcoming chill waters of a massive lake. What population there was still included remnants of the native tribes of the region, dislocated and confused by exposure to the edges of the European market in fur and its incessant demands for product. By 1833, a majority of the Indian population, after a devastating war and increasing prejudice against them, had ceded tribal lands in return for grants further west. Fur traders and their structured monopolistic companies, the United States Army, and an array of wanderers and speculators from more settled parts of the country made up the rest of the Chicago populace, which swelled to 4,000 in the period between 1833 and 1837.²⁴

As the grid of civic structure was driven into the unsettled Chicago community, the last remains of earlier culture frayed and disappeared. English speaking fur company men, American businessmen, and the U.S. Army garrison began the process of upending the social structure and establishing a class system, where before the French Canadian fur traders had melded into Indian life and newly arrived anglos mixed easily with them. New Orleans, in the same era, was already a structured community, entrepot of a booming cotton trade whose price fluctuations could be felt in the banking houses of London.

The earliest French culture of Chicago was different from that found in early New Orleans: it included more Indian ingredients. At the dawn of the nineteenth century, for example, dances

were a popular social event in both cities — but the Chicago dance card might also include Potawatomi social dances during the evening. Native American cultural attributes never reached that level of social acceptance by the ruling government’s personnel in New Orleans. On the other hand, the French language and French cultural influences were still vibrant in New Orleans into the 1830s while they were fading or marginalized in Chicago.²⁵

Imposition of an outside force controlling economic structure was, because of previous experience with the all-encompassing power of the fur trade companies, more easily accepted in Chicago. In New Orleans the joining of the city to the United States involved long lasting power struggles between the enterprising newcomers and the entrenched local economy of European-oriented planters and merchants. In both areas the population grew in the first third of the nineteenth century from immigration to the region. Some immigrant groups were found in both areas. As they would in New Orleans, Irish laborers in Chicago helped dig the Illinois-Michigan canal.²⁶

By the mid 1820s, the nation had gone on a canal-building binge. In New York state, the Erie Canal neared completion in 1824, the Delaware canal was begun by that time, and projects were scheduled in New Jersey, Ohio, Indiana, Pennsylvania and Illinois. By the 1830s, when the Canal Bank constructed the New Basin Canal in New Orleans, canal construction was widespread throughout the country. The Canal Bank was incorporated ‘to construct a Canal from some part of the city or suburbs of New Orleans above Poydras Street to the Lake Pontchartrain.’ It was capitalized at \$4 million and shares had a par value of \$100. Commissioners included Beverley Chew, Archibald R. Taylor, Samuel Livermore, B.F. Burthe, James Foster, Jr., Maunsel White, and Charles Genois. Directors for 1831 were Archibald R. Taylor, President; John Linton, James Purdon, Foster, Charles Byrne, Edward Yorke, John

Minturn, Samuel Livermore, W. H. Wallace, William M. Beal, Harry Elkins, Horace C. Cammage, A. Longer, Chew as Cashier, and Livermore as Counselor, with G. R. Stringer, Notary.²⁷

In New Orleans, this new canal would provide access to Lake Pontchartrain from the back of the district above Canal Street, which had evolved into the sector where American business interests held sway. The old Carondelet Canal and Bayou St. John served the older section of the city, the French Quarter or Vieux Carre, which was where the Creoles, the remnants of the pre-American establishment of the city, prevailed. Albert Stein served as engineer, overseeing completion of the New Basin Canal. The enterprise involving digging through swamps, causing the Irish immigrants who provided the labor to die in great numbers from infectious diseases contracted under dismal working conditions.²⁸

Stein continued to see water as a major asset of the city, something that could be harnessed for positive purposes, that could help the city survive, and thrive. Besides the waterworks and the New Basin Canal, Stein concerned himself with another of New Orleans's major engineering problems of the nineteenth century: keeping the mouth of the Mississippi River open, with a deep channel for shipping to use. The problem of silt blocking passage at the mouth of the Mississippi was one that had been recognized since the time of the earliest European explorers. Under the French, various plans were made, including the use of a "harrow" — a plow-like device to be dragged through the clogging mud by two ships. Dredging, digging up the bottom and moving the refuse to the side of the channel, was also considered and would continue to be tried through the years. Blocking some of the passes and forcing the water through a limited channel was also tried.²⁹

The Duke of Orleans, Regent of France, actually offered a prize of 10,000 livres to anyone who could devise a method of clearing the bar of the Mississippi.³⁰

The idea of confining the water by use of jetties and thus creating a limited channel through which the water would flow in force was an idea that occurred to French engineer Adrien de Pauger in 1722, and which again was mentioned by Capt. Richard Delafield, when he inspected the river bar in 1829 at the behest of Congress. Jetties were impractical and impossible to construct, both de Pauger and Delafield decided. In that period, the State Engineer of Louisiana, Benjamin Buisson, also suggested a canal be dug so shipping could avoid the bars at the mouth of the River³¹

The problems of ships not being able to easily access the Mississippi River from the Gulf were not merely a question of trade and the economy, but of the nation's defense. Gradually, military engineers became more involved in navigation access improvements. The final result would be the giving of waterway construction authority to the U.S. Army Corps of Engineers. Thus it was that one nineteenth century Army officer spent much of his career in the Gulf region with specific involvement in the problems at the mouth of the Mississippi.

William Henry Chase was born in Massachusetts in 1798 and graduated from the U.S. Military Academy at West Point in 1815, with the engineering training that the army had as an important part of the curriculum for officer education. Chase had a brief assignment repairing Fort Niagara near the Canadian border, but in 1819 he was sent to New Orleans to begin reinforcement of the country's Gulf of Mexico border region. He would supervise building of fortifications at Fort Pike, Fort Macomb, the Rigolets and Chef Menteur. By then a Captain in the Army, he was also assigned to defenses around Pensacola, Florida. Beginning in 1836, he was assigned work at the mouth of the Mississippi River, and was promoted to the rank of Major

in 1838. His last Army assignment was in Key West, Florida in 1854. In 1856, President Franklin Pierce appointed Chase superintendent of the Academy at West Point, but Chase resigned from the Army that year, and when the Civil War began, Chase chose to side with the South. He stayed in Pensacola, Florida, and died in 1870.³²

Congress finally passed a law calling for an expenditure of \$75,000 for river bar improvements on the Mississippi in the late 1830s. Capt. Chase, the district Army engineer, used the survey results of Lt. Benjamin Poole, who observed the river in 1837. Poole pointed out that a shipping canal was feasible, but also noted that jetties could confine the river and force clearance of the bar — but when Chase made his report, he concentrated on dredging, and the possible construction of a canal. Chase was doubtful that jetties, which he defined as a simple row of pilings outlining the river course, would succeed. Albert Stein was critical of Chase, and championed the building of jetties, but Stein's warning fell on deaf ears in Washington.³³

Chase solicited opinions from Louisiana State Engineer George W. Long, and Fred Wilkinson, Deputy Surveyor General, but even they did not agree with idea that a canal was a possible solution. The end result, with an infusion of money by Congress, was that dredging was carried out to no avail — \$285,000 was spent and by 1840 the river was silted again.³⁴

On September 30, 1850, Congress appropriated \$50,000 for a topographical survey of the lower Mississippi to be conducted by Capt. Andrew A. Humphreys and Lt. Henry L. Abbott. They had the advantage of a report done at the period by Caleb Forshey, a Louisiana professor. Forshey came out in favor of jetties, and he had the expected ally, Albert Stein. By 1850 and 1851 Albert Stein was relocated Mobile, where he purchased the local waterworks, and, writing regularly in DeBow's Review, was highly critical of all the studies, strongly supporting jetties.³⁵

By 1855, there was great public outcry over the stopped mouth of the river and Congress again went to William H. Chase to head a study. The final report predictably found jetties to be an unsure solution — they might eventually cause silting. Finally a bill was passed, over the veto of President Franklin Pierce, that allocated \$330,000 to the river problem. Again dredging was tried, and again failed. Only decades later in the 1870s would James Eads’s construction of jetties open a clear passage from the river to the Gulf and solve the problem.³⁶

Albert Stein set forth his views on the problem of navigation at the mouth of the Mississippi in an 1841 pamphlet of a letter to the New Orleans Chamber of Commerce President, Samuel J. Peters. Peters, a Canadian who had come to the city as a young man, was an important businessman in the American sector, and besides taking credit for beginning the public school system in the city, was involved with numerous public improvements. Stein refuted William Chase’s findings on the Mississippi River problem, which had been published in a periodical, the “*National Intelligencer* in the months of November, 1837, and January, 1838.” Stein had already advocated a plan for jetties to New Orleans officials and businessmen, and Chase disagreed with it.³⁷

After Stein read Chase’s objections to his own plan, he took it as an “imperative duty” to refute the objections, due to “a decent regard for my own reputation.” Stein credited Chase with wanting to put an end to all discussion of control of the river by jetty structures as a “rash intrusion on Nature’s mysteries.”³⁸

Stein went on to explain that the Mississippi River, carrying much sediment, was constantly depositing sediment and forming new deltas, then making new channels, or passes, around them as the river debouched into the Gulf of Mexico. When the sediment became too high, the river flow slowed and was constricted. The Mississippi, like the Rhine, the Nile and

the Danube, would be able to maintain a sufficient depth for vessels if it could only have greater momentum in its descent to the gulf.³⁹

“It will require more efficient means to prevent the alarming increase [of sediment at the mouth of the river] than mere dredging machines.” Stein declared. The important thing to do was to increase the river’s velocity.

Stein had a decided position against diverting any or all of the Mississippi’s water for any reason. He stated that he did not believe that floods could be prevented by any effort to “clear and deepen the existing natural channels and open some artificial ones above New Orleans”, to discharge part of the river’s water through another route to the gulf. He added that “the confluence improves the condition of a river” (i.e. when other streams join into the river the original stream’s velocity increases) “while the diffluence is generally more or less prejudicial to it.” (i.e., diverting part of the river decreases the velocity of the original stream’s flow.) Stein had a willing listener for this theory in Samuel J. Peters, who would argue against such a plan later in the 1840s.⁴⁰

The sediment carried by the river was not deposited according to its weight, with heaviest particles dropped first, but instead was deposited according to the velocity of the river, which in turn was affected by the turns and curves along its route, Stein insisted. While Chase reported that the waters of the Gulf of Mexico were forcing the Mississippi River to deposit sediment because of gulf currents that met the river as it arrived, Stein felt that the problem was more likely the fact that the river was widening, spreading out wider and becoming shallower, as it reached the gulf.

If the river had a narrower bed, it would concentrate its forces and flow more swiftly, thus digging a deeper channel and forcing its silt further out. As Stein stated:

“In order to improve the navigation at the mouths of the Mississippi, it is necessary to employ the force of the stream itself....Thus, by the contraction of the Pass to a proper breadth, the stream obtains a sufficient power, not only to deepen its channel, but also to transport, to a great distance into the gulf of Mexico, the heavy materials, which are borne along by the river from above....”⁴¹

Stein also felt that dredging without stream restriction by jetties was useless: as the sediment was moved aside, the river would simply shift its wide flow to cover the new area and would eventually deposit sediment again throughout its wide channel. As futile efforts to clear channels by dredging continued, Stein would be proved correct.⁴²

Furthermore, in the work to undertake erecting jetties to restrict the stream bed, Chase’s contention that a row of pilings would do the job was “miraculous,” Stein mocked. Rather, the beginning of stream restriction would have to be done with fascines, flexible mats of branches, since “a pliant recuperative endurance will triumph where the most sturdy resistance would be entirely unavailing.”⁴³

Fascines had been recommended in New Orleans by Benjamin Latrobe in 1816 but not adopted. In the modern era, fascines, “mats of synthetic materials”, were still being recommended for use in “armoring” levees in planned hurricane protection improvements after Hurricane Katrina. Fascines were also used in military siege maneuvers. At the 1815 Battle of New Orleans, the original British plan to charge the American lines had called for fascines to be brought from the rear and propped on the American earthworks to enable the troops to scramble over. Unfortunately, the 44th Regiment, Irish troops, left the fascines and ladders in the rear and had to return to bring them up, thus losing valuable time. Ultimately the British lost the battle and the commander who had responsibility for the missing fascines was court-martialed and dismissed from the service.⁴⁴

Stein, while remaining an advocate of the use of the ever-reliable fascine, was still trumpeting the virtues of river jetties a decade later in 1851 when he published another pamphlet, this time in response to a report of Charles Ellet, a civil engineer reporting to the Topographical Corps, which would become part of the U.S. Army Corps of Engineers.

Ellet had proposed that the only way to clear the south Pass of the Mississippi River was by dredging. He stated that the sediment deposited at the mouth of the river was actually carried there by the salt waters of the Gulf of Mexico. Stein pointed out that Ellet's report was "full of contradictions and inconsistencies . . . directly opposed to every principle of science, and to all the teachings of professional experience."⁴⁵

The mud at the mouth of the river was sediment which the river carried with it. Stein insisted. Dredging "however profitable it may be to those who have the management of the *job* [sic], will prove an expensive failure to those who will have to foot the bill," Stein stated prophetically.⁴⁶

Jetties that constricted the river flow would be the only method that would work. As Stein reiterated: "the current of the river itself will be found to contain a power that will — and, let me add, it is the only power that ever *can* — improve the navigable capacity and permanently maintain that improvement."⁴⁷

Stein became especially testy when considering Ellet's expertise. "Is it not rather strange to find, in the present day, men professing to be hydrotechs, yet utterly ignorant of the simplest principles upon which their profession is based?" Stein noted.⁴⁸ Always a man of strong opinions, Stein left New Orleans for Mobile, Alabama, in 1840. He leased the waterworks of that city, and made his home in nearby Spring Hill, where he and his family resided, and where a street named Stein still exists. He died in 1874. Stein was a respected waterworks engineer —

indeed, the builders of the New York Croton Aqueduct called on him in the 1830s as a consultant, and his figures for water volume were accepted and used in the project. In addition, he had built the first sand-filtration water system in the country, before he even began his New Orleans adventures.

Stein was skilled at his profession, he was knowledgeable in his field, and was consulted and given work because of his expertise. As creative as his ideas were, and as well-founded on the technical skill he possessed as a “hydrotec”, Stein could only suggest: if those with power to finance and choose methods for completing projects did not agree with his views and his interpretation of the science involved in the work, he could not proceed. Just as Stein knew that a river ran with more power and force after a confluence, when another river joined its course, so major improvements could only come when there was a confluence of both the science, from professional practitioners, and the power, from decision-makers.⁴⁹

Regarding the expense and trouble that the Commercial Bank of New Orleans encountered in their pursuit of the illusive plans and documents of Albert Stein, the bank seems to have been more punitive in their quest than might have been expected. The Supreme Court ruling in the case appears to be a sensible one, perhaps even a decision that two reasonable parties might have reached on their own. A compromise between Stein and the bank does not seem to have been a possibility. Perhaps the Commercial Bank did not appreciate Stein's somewhat abrupt resignation, since his written notice was sent nine days after the fact. Perhaps they also were aware of his work for the city, and for the Canal Bank, and this may have made them feel that the waterworks no longer had his full attention. And, it may be that the "doubts" that the 1836 Water Works Committee pamphlet attempted to assuage grew rather than lessened.

One reason for his battle with the bank may have been Stein's own personality.

According to his obituary, he

had but little forbearance toward error, or toward ignorance...His scorn of a conceited adversary was unqualified, and he would scarcely condescend to argue with opposition....This positiveness of bearing in controversy created antagonism, instead of conciliating sympathy, and greatly diminished his influence upon his contemporaries.⁵⁰

For whatever reason, Albert Stein and the Commercial Bank of New Orleans had found themselves entangled in a legal dispute that would stretch over five years -- a good three years longer than the waterworks that brought them together had taken to complete.

In the best possible outcome, power and science, working together, bring change and improvement. Those who have the power can choose the science by which improvements are made. At times, those who have the scientific knowledge can not convince those with power to use that knowledge. In this era in New Orleans, Albert Stein had technology on his side: his waterworks functioned, he completed his canal project, he was an accomplished engineer with proven capabilities. But, he struggled mightily to implement his own ideas, to use his own methods, to chart his own life in his own way. In Jacksonian America, the idea that the common man was important might force a reaction against knowledgeable professionals. Stein dared stand up to those with power in a time when those with scientific knowledge, were only beginning to command respect, long before there was any assumption that science and technology merited primary consideration in planning for the future.

End Notes

¹ Commercial Bank of New Orleans v. Albert Stein, Docket #3691, (Supreme Court of Louisiana Archives, Department of Manuscripts and Archives, Earl K. Long Library, University of New Orleans

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³ Commercial Bank of New Orleans v. Albert Stein; Mobile Register, 20 Sept. 1874.

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- ⁴ Commercial Bank of New Orleans v. Albert Stein
- ⁵ M. N. Baker, The Quest for Pure Water: The History of Water Purification From the Earliest Records To the Twentieth Century (New York: The American Water Works Association, Inc., 1948), 127- 130.
- ⁶ Nelson Manfred Blake, Water for the Cities: A History of The Urban Water Supply Problem In the United States, Maxwell School Series - III (Syracuse: Syracuse University Press, 1956), 266.
- ⁷ Report of the Water Works Committee of the Commercial Bank of New-Orleans. Presented February 18, 1836, and Published By Order of the Board of Directors (New Orleans: Gaston Brusle, 1836), 1-14.
- ⁸ Report of the Water Works Committee, 6, 14; John Gibson, Gibson's Guide and Directory of the State of Louisiana and The Cities of New Orleans & Lafayette (New Orleans: John Gibson, 1838), 337, 353.
- ⁹ Report of the Water Works Committee, 4.
- ¹⁰ Report of the Water Works Committee, 6.; Gibson, 336.
- ¹¹ Report of the Water Works Committee, 9-12.
- ¹² Report of the Water Works Committee, 14.
- ¹³ Commercial Bank of New Orleans v. Albert Stein, Supreme Court of Louisiana Archives.
- ¹⁴ Commercial Bank of New Orleans v. Albert Stein, Supreme Court of Louisiana Archives.
- ¹⁵ Commercial Bank of New Orleans v. Albert Stein, Supreme Court of Louisiana Archives.
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- 24 Jacquelyn Peterson, "The Founding Fathers: The Absorption of French-Indian Chicago, 1816-1837"; 301-335; Melvin G. Holli and Peter d'A. Jones, eds. Ethnic Chicago: Revised and Expanded. (Grand Rapids, Mich.: Erdmann's Publishing Company, 1984.)
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- 36 Walter M. Lowrey, Navigational Problems at the Mouth of the Mississippi, 159, 173.

³⁷ Albert Stein, Letter to Samuel J. Peters, esq., President of the New Orleans Chamber of Commerce, in Relations to the Improvement of the Navigation of the Mississippi River., (Philadelphia: J. Perry, February, 1841), 3.

³⁸ Albert Stein, Letter to Samuel J. Peters, esq. 3

³⁹ Albert Stein, Letter to Samuel J. Peters, esq. 4.

⁴⁰ Albert Stein, Letter to Samuel J. Peters, esq. 6.

⁴¹ Albert Stein, Letter to Samuel J. Peters, esq. 28, 29.

⁴² Albert Stein, Letter to Samuel J. Peters, esq. 29.

⁴³ Albert Stein, Letter to Samuel J. Peters, esq. 16, 17.

⁴⁴ Robert V. Rimini, The Life of Andrew Jackson New York: Harper and Row, 1988) 101; Walter R. Borneman, 1812: The War That Forged a Nation (New York: Harper Collins, 2004) 285, 300, 301. The Times-Picayune, 21 February, 2006

⁴⁵ Albert Stein, Remarks on the Report of Charles Ellet, Jr., Civil Engineer, in reference in to the deepening of the passage over the bars at the mouths of the Mississippi, New Orleans, 1851), 13. 14.

⁴⁶ Albert Stein, Remarks on the report of Charles Ellet, 13.

⁴⁷ Albert Stein, Remarks on the report of Charles Ellet, 13.

⁴⁸ Albert Stein, Remarks on the report of Charles Ellet, 10.

⁴⁹ For the remainder of his life Stein continued to be involved in controversies. Records of a suit, *Albert Stein v. George W. Ashby*, Supreme Court of Alabama, January term, 1857, are in the University of Virginia Library, and *Albert Stein v. John Burden*, Alabama Supreme Court, no provenance, is in the Library of the University of North Carolina Chapel Hill. Apparently Stein's Louisiana court experience did not keep him from being litigious. It is possible that he also was involved in a court case over a partnership he did not receive for his work in Cincinnati early in his American career.

⁵⁰ Mobile Register, 20, Sept. 1874.

Chapter 6. Sudden Impact: 1835-1855

For a brief period from 1836 to 1852 the City of New Orleans divided itself into three municipalities: the First Municipality, centered on the French Quarter and including the bulk of the Creole population, whose forebears had peopled the city in the colonial era; the Second Municipality, upriver of Canal Street where the Americans were found; and the Third Municipality, the poorer section downriver from the French Quarter housing a number of Irish and German immigrants. This unusual experiment in municipal governance might be construed as a precursor to the concept of a modern metropolitan area. At the time, it was both a desperate attempt to solve growing problems of financing civic improvements in an atmosphere rampant with neighborhood bickering, and a reckless flouting of common sense by letting anger over differences in citizens' opinions split a city apart.

Any attempt to catalogue the areas of difference that resulted in this civic split must take into account the political, cultural, economic, religious and racial factions into which the New Orleans citizenry divided itself at the time. More important than the setting of district boundaries, however, was the change that this signaled in the locus of civic decision-making power. While the angry voices of the voters made the loudest noise, there was also an underlying whisper of changing laws and a shift in the power structure, reflecting the growing importance of the new American merchant class to the economy of the city. And, in the middle of New Orleans' metropolitan tripartite phase, the State of Louisiana approved the new State Constitution of 1845, profoundly changing the city's business and financial climate, and at the end of the tri-partite experiment, many of those changes were reversed and others were made in the new State Constitution of 1852. The ethnic divisions that bore much responsibility for the

split, the differences between the Creole “ancient population” and the English-speaking Americans, were not resolved by later municipal reconciliation but lingered as political and social factors into the next century.

Particularly in the area of infrastructure -- where decisions were required on what work was needed, how to do the work, who would do it and how to pay for it -- the three-headed municipal monster functioned poorly. In the area of water infrastructure the picture was bleakest: not only was lack of coordination foolish, it was disastrous. A Mississippi River Crevasse and flood in 1849 kept much of the city, including parts of all municipalities, under water for weeks. Hindsight suggests that a united civic approach might have dealt with the problem more efficiently. And, it could be that Jacksonian democracy, with its decreased emphasis on the necessity for an educated and skilled electorate and its focus on the common man, may have provoked an anti-intellectual atmosphere in which scientific and technical knowledge was slighted. This was coupled with shortsightedness on the part of the business class, which was quickly assuming power as their control over the local economy strengthened. The struggles of the conservative Whigs against the Democrats, and the effect of inroads of the Native American, “Know Nothing” Party in the state exacerbated political differences. The end result was a civic tragedy which may very well have been avoided.

The municipal split in New Orleans must be viewed in its national context. Nationwide, in this period there was a change in how cities were defined and structured. In another trend, property owners bent on having a say in how they were taxed and governed began flexing their muscles and increasingly assumed power over civic decision making. This was also the beginning of a period during which the Native American, or “Know Nothing” Party fomented hatred and distrust of new immigrants and the non-English speaking. All of these factors

figured in the problems besetting the city of New Orleans, at that time one of the five largest metropolitan areas in the country and second only to New York as a port.

Since its founding by French Canadians as an outpost of the French Empire in 1718, New Orleans had absorbed a varied mix of peoples into its population. There were not only descendants of the original European settlers and a few remnants of local Indian populations, but a polyglot assortment of assorted heritage, as well as African slaves, free people of color, and, after the 1803 Louisiana Purchase, more and more Americans.

These peoples, plus traders and seamen from throughout the world, immigrant groups attracted by hopes of a brighter future in America, and refugees fleeing the revolts in the French Caribbean island of St. Domingue managed to co-exist in a multi-lingual town where the very landscape seemed to work against human civilization. The city was rimmed by a river and a lake, both inclined to overflow, and its other boundaries were marked by miasmatic swamps where disease-bearing mosquitoes waited to strike the unwary. As geographers might comment, the city's site – on a major trade route – was excellent. Its situation was not so salutary.

By the 1830s the electorate of the city had divided into two main interest groups, the “ancient population” of white French-speaking Creoles (locally born descendants of European colonists) and the English-speaking Americans. Other groups, both part of the electorate and not, included German and Irish immigrants, free people of color, and slaves. The city was primarily Catholic, but even here divisions had begun between the Creole (French or Spanish speaking) and Irish (English speaking) communicants. After 1803, some efforts to provide religious institutions for Protestants had begun, and there were a small number of Jews among the citizens.

The division of New Orleans into three parts was also part of a contemporary national trend changing the nature of city governance. Even the language was changing to reflect new concepts: the phrase “municipal corporation” was coined in the nineteenth century to describe the new identity of the American city.

In the colonial era, cities were granted charters solely as “a mercantilistic agency of the sovereign for the encouragement and regulation of commerce.” A change in the 1830s came because state legislatures, encouraged by residents of cities, redefined the role of the city itself, changing it from an agency of business and commerce into “an agent for the provision of services to residents as a means of promoting the welfare of urban society.”¹

The cities of New York, Cincinnati and New Orleans, all became “municipal corporations” because their respective states (New York, Ohio and Louisiana) all re-wrote their state constitutions in that period, and in each case laws governing corporations were changed. The changing nature of the concept of what defined a city forced changes in the governmental and legal structure of both the city and the state.

The most dramatically changed city was New Orleans, mainly because of “the 1836 charter amendment which divided the City of New Orleans into three separate municipalities.” Here the split was not only geographic but ethnic. Presumably, the state legislature had acted “principally in response to appeals of the American Sector in New Orleans” in repealing the city’s old charter and granted its new, trifurcated one. The charter of Greater New York was similar.²

The New York charter, granted in 1830, rather than solely reflecting divergent views based on area of residence or cultural identity, was more of a checks and balances form of government, with the executive branch (the Mayor) and the Legislative branch (alderman elected

by district) jointly governing with the legislative branch enacting laws and the mayor carrying out their aims. New York and New Orleans both had an annual meeting of the corporation, with the Mayor reporting, and in New Orleans this meeting was where all the aldermen considered questions pertaining to the city as a whole. Both the New York and New Orleans charter changes could be seen as a reflection of the cities' change from a government that functioned solely with citizen's volunteering (as firemen, for example) and relying on citizens to provide many of their own services (privy maintenance, reporting of nuisances for a portion of fines charged) to a government that became a responsible entity charged with providing services to those who lived within the city's bounds. In New Orleans, those ethnic differences in the three municipalities might also have effect on what services were wanted, what improvements were made. The Creoles in the First Municipality might not be as focused on modernization as the Americans in the Second Municipality, while the recent immigrants in the Third municipality could not afford to make choices at all. ³

The New Orleans charter, although it took steps toward the idea of a government charged with providing services, reflected in its three municipalities the barriers -- cultural, philosophic and financial -- that were already dividing the populace into separate interest groups.

Strife came from outside financial pressures as well. Because Louisiana, a former European colony, has a legal system using Civil Law (roughly, depending on written statutes) rather than only the usual Common Law (depending on judicial decisions), the State Constitutions of 1845 and 1852 not only directly affected the city government and its power but also tampered with the financial climate of the state as a whole and with the very process of legislation itself. The draconian restrictions on banking included in the 1845 Constitution, while similar to those enacted in other states, were hardest on the New Orleans business sector. Thus,

the economy of the city suffered under the state's remedy as much as from the injuries inflicted by the Panic (economic depression) of 1837 to which the 1845 Constitution was a reaction.

The passions that had torn New Orleans apart were also due to the conflict between the French-speaking Creoles and the more recently arrived Americans. Besides a language barrier, there was a cultural one as well: Creoles more readily accepted dancing, even on Sundays; allowed alcohol to be sold, even on Sundays; adopted a *laissez faire* attitude toward gambling, and were accustomed to having free people of color (who were also Creoles) as part of the population. From their stronghold in the present Vieux Carre they controlled the area that historically had held the commercial heart of the city, and this became the First Municipality in the tri-partite city. The Americans, quartered just upriver, quickly began developing a commercial area of their own above Canal Street and spreading upriver with ever more grand residential areas, and this would become the Second Municipality, where even the style of buildings would differ from that in the oldest section of the city. The Third Municipality, downstream from the others and away from the commercial riverfront, had the highest immigrant population, mainly Irish and German. These immigrants, who were eligible to vote after six months residence, tended to vote with the Creoles, perhaps seeing them as fellow Europeans. Irish immigrants along the riverfront above Canal Street, the "Irish Channel," also sided with the Creoles, presumably because, as Catholics, they were co-religionists. Thus the Creoles, while a minority themselves, controlled the majority of votes in the city in the middle decades of the nineteenth century before the Civil War.

In the Constitutional Convention of 1845 cultural differences played a part in the discussions, with the Creole Bernard Marigny jousting at windmills as he vainly tried to protect the rights of the French speaking "ancient population." Perhaps in order to increase the Creole

electorate, or perhaps simply because he considered it a fair and proper thing to do, Marigny proposed at one point that the vote be given to “selected free men of color, provided they were native born.” When he saw how poorly it was received, he quickly withdrew the suggestion. That he made it at all is incredible, and, perhaps, commendable. It certainly demonstrates that the white Creoles of New Orleans were unpredictable: while they supported the racial restrictions of the time, they could recognize their affinity with fellow Creoles whose skin was dark.⁴

The general effect of the 1845 Constitution was to sharply limit the power of the legislature and the courts (thus strengthening the force of Civil Law) and, in reaction to the Panic of 1837, to severely curtail banking. One law forbade the formations of new banks -- but with another law, monopolies were also forbidden, thus making the five remaining banks into an actual, but perhaps illegal, monopoly. Another confusing law forbade cities’ participation in public corporations. The effect of this measure would be to forbid the sort of corporations -- banks chartered with the mission of funding construction of civic infrastructure improvements -- that had already built a New Orleans waterworks, dug a canal, and made a start at improving the state’s railroads. This 1845 Constitution, filled as it was with barriers to public improvement and foolishly backward in curtailing banking, was one that could be embraced by Democrats, the party of Andrew Jackson, and purportedly the party of the common man.⁵

As far as political division, New Orleans factions embraced either the Democrats (pro-Jackson, anti-banks) or the Whigs (generally favorable to business, pro-banking and anti-Jackson) with, after 1840, the Native American Party having followers (including local Catholics, even if the “Know Nothing” party was violently anti-Catholic.) New Orleans might fit into a national political mold, but there was always the addition of a little extra spice.

As the new tri-partite New Orleans was set up, the three municipalities of the city each had a government with independent power, but there was a Mayor and a general council over the whole city. In essence, the municipalities “had complete control of all their local affairs, paving, improvements, etc.; they could fix taxes and issue bonds, which they did quite actively.”⁶

Each municipality had a board of regionally elected aldermen with a presiding officer called the Recorder, who also served as a judge. Annually, on the first of May, the aldermen met as the General Council in the Cabildo (the old Spanish colonial government house) which served as City Hall for the entire city as well as the for First Municipality in which it was located. The resulting system of government was a division of powers “on much the same lines as that between the Federal and State governments.” The General Council “enjoyed only such powers as were specially delegated to it” with all other powers settled on the municipalities. The General Council set wharfage rates and license fees, operated the police department and set the salary of the mayor. All the municipalities contributed to upkeep and running of the jail, and pro-rated the income from vehicle license fees for hauling, by area revenue. Each municipality’s total revenues also set its share of the entire city’s debt.⁷

The effect on improvements was positive: “the three councils competing with each other to see which could make the most progress.” Such improvements included the water works, the New Basin Canal, the construction of several new hotels and the formation of banks. In fact, the water works, the canal, the St. Louis Hotel (First Municipality), and the St. Charles Hotel (Second Municipality) were all products of improvement banks, a method of financing that was soon eliminated. The Constitution of 1845 put such limits on banking that the Commercial Bank (which built the water works) failed. The Canal Bank would maneuver its way through state and local politics and legal changes until it, too, failed in the Great Depression of the 1930s.

Other banking was so curtailed that the building boom of the 1830s, which accounted for the building improvements could not continue into the next decade.⁸

In another view of the tri-partite system, “there was no very clear definition of the limit of powers” between the municipalities and the central government and “the consequence was endless dispute and litigation.” All the powers that had formerly belonged to the Mayor were now “parceled out among the Recorders.”⁹

Permanent changes were made in New Orleans even during the seemingly ineffectual period of the three-way split. One curious but long-lasting effect of the administration of the three municipalities resulted from the fact that, since the police were under the administration of the central government, they could not use a single municipality’s insignia. Making do with the insignia found on the Mayor’s shield, the police began wearing silver-plated badges with a star and crescent design – the same design used by the New Orleans Police Department today. In another public act during the period of separation, the cornerstone for the monument to Andrew Jackson in Jackson Square was dedicated in 1839, with the General present. The statue arrived sixteen years later. With no reason given, Jackson did not attend a planned 1839 dedication for a cornerstone of a monument at the site of the Battle of New Orleans in Chalmette, and that monument was not completed until 70 years later.¹⁰

Even during the tri-partite phase, the three New Orleans municipalities retained the existing Ordinances, or the laws, of the city, while adding new ones. Cities, since the eighteenth century, had enacted ordinances for “maximum opportunity for the promotion of individual commercial pursuits and maintaining the public order.” By the 1830s the cities were publishing their ordinances. Indeed, in the tri-partite era, New Orleans municipalities published their own books of ordinances. These ordinances sometimes applied to the city as a whole; that is, the

original city ordinances were still applicable in each municipality, although the separate municipalities could enact their own ordinances. These ordinances often were aimed at regulating citizens' public behavior and placed responsibility for public order in the hands of citizens rather than resting responsibility for enforcement and services solely on governing bodies. Ordinances also governed matters concerned with the city's infrastructure: transportation, drainage, water service, sewage, and pollution. Public participation was not only encouraged, but it was expected and demanded in provision of infrastructure services.

According to Ordinances published by the Second Municipality in 1848, the registration by license for drays, public carriages, was accomplished by requiring three-inch high license numbers to be painted on the wagon-beds. The General Council might set license fees, but the Municipalities regulated licensing procedure by judicious use of Ordinances, and the wagon owners were charged with having the required numbers painted.¹¹

The handling of drainage, a vital infrastructure need in the saucer-shaped city, depended heavily on citizen participation and was governed by Ordinances. The three municipalities kept the original ordinances when they had been in effect before the split, but each seems to have kept its own ordinance books. For example, the Second Municipality had on the books a drainage Ordinance dating to 1817 which forbade anyone from "obstructing the natural draining of any road or public way, by filling up, stopping up, or turning the course of any ditch or canal," even if the ditch or canal ran through that person's property. The offender could be denounced by two fellow citizens and subjected to a \$50 fine, and be charged with returning the ditch to its prior condition. In a separate Ordinance dating back to 1815, the required drainage that landowners must themselves provide was set out:

For every lot having sixty feet in front, and for every courtyard, in case of a divided lot, there shall be formed a cross gutter, to drain off the waters of the said court-yards and lots.¹²

In other waterway matters an additional Ordinance forbade the use of “pirogues, canoes or other craft” in canals “dug at the expense of the Corporation for the use of the City” under penalty of a ten-dollar fine. Small craft, besides avoidance of usage fees, would be a nuisance to commercial shipping coming in through the New Basin Canal or the old route via the Carondelet Canal and Bayou St. John, but an additional hindrance to navigation was provided by nude swimmers. According to an 1828 Ordinance the fine was ten dollars for each transgression of the anti-nude swimming law.

Resolved: that is expressly forbidden to any person whatsoever to be seen bathing naked, in the waters of the Mississippi, in the Basin and Carondelet Canal, or in any other ditches or basins that in future may be established in frequented places, as also to show themselves naked or in indecent apparel on the shores of the river and also on the pickets of the causeway on the bar of Bayou St. John at Lake Pontchartrain, not only during the day time but until ten o'clock in the evening.¹³

It is tempting to wonder whether those reading this Ordinance frequented the exactly described spots where the offending bathers could be viewed. And, as with all ordinances, the fact that something is forbidden can be taken to mean that something is occurring regularly enough to be noticed. Thus, prohibitions against actions can be proof that the actions are taking place.

Ordinances also regulated fire protection, requiring, for example “each home owner to provide two good fire buckets and a ladder.” Sanitation, as regulated by Ordinance, required that privies must be at least seven feet deep and three feet from a property line, could be emptied only at night, and that no ordure might be flushed into gutters. An Ordinance forbade the throwing of “water, urine, filth or any thing that may hurt, damage or soil an person passing by” from a

window or balconies – from which kite flying was also forbidden. Certain industries were kept from the city by Ordinance, such as tanneries, slaughterhouses and hog farms, and burials could be made only in authorized cemeteries. There was even a clean air ordinance. Three physicians might examine the place causing a stench and make a report to the mayor. The Mayor, thus informed, could levy a fine of fifty to one hundred dollars.¹⁴

In another nuisance Ordinance governing sound pollution, there was a fine of five to fifty dollars to be levied against “any person blowing a trumpet or beating a drum in the streets . . . except for public auctions and excluding the military.”¹⁵

Ordinances governed the private companies providing infrastructure services, as when the “Commercial Bank and Water Works” was required to set up barriers “at the intersections of the streets on which they are laying down their pipes” to prevent carriages from passing. The private company might also have its investments protected by Ordinance, as in the following:

Whereas, it has become a practice for individuals to open fire plugs to obtain a supply of water for domestic purposes and otherwise abuse the use of said fire plugs. . .

Be it resolved that it shall not be lawful hereafter for any persons or persons to open any of the fire-plugs, conduits of the water works of the Commercial Bank of New Orleans, unless duly authorized; the same being for the use of extinguishing fires, washing markets, hose, hose carriages, the cleansing of the streets, and other public uses.¹⁶

The fine for violation of the fire-plug Ordinance was fifteen dollars, with half going to the informant and half to the Municipality. Thus the public was not only required, but also rewarded for protecting the investment of the company providing water service to the city under a franchise agreement. And the water company had the right to demand public help in protecting its property. The Second Municipality gradually became more involved in oversight of the private franchises, as when an 1847 Ordinance required that damage done to the streets by water and gas works companies laying pipes, would be repaired “under the supervision of the Surveyor

of this Municipality.” Since the Second municipality had the most funds, it was able to do more work.¹⁷

Performance requirements could be set for private franchisees by Ordinance, and this was done by a municipality requesting action by the Mayor. Thus the First Municipality Council, in Water Vendors Ordinance 726, could ordain that

The Mayor is requested to apply to the Commercial Bank in order to have one or several fountains located at such places as he may think the most suitable in order to supply water dealers with water.¹⁸

The bank’s price and the water vendors’ price was also set by Ordinance:

The Commercial Bank shall have the right of requiring twelve and a half cents from the water-dealers, for each barrel of water taken at such fountains, the dimension of each barrel to be such as not to contain over one hundred gallons; and the water dealers shall have the right of requiring for each barrel of water a price not exceeding fifty cents.¹⁹

Prices being set, the bank then installed hydrants on Canal Street, St. Peter Street and Esplanade Street, all located between Burgundy and Rampart Streets, which was the farthest from the river that water pipes were laid when the original cast iron pipes were put in during the 1820s. The need to regulate water vending also demonstrates that a large number of residents had no access to the city’s water system. No repeal of the limits on fees is recorded, and extension of the water system in later years may have satisfied the public need for water. But, although an immense brick reservoir for water had been built in the Second Municipality by 1839 and pipes were laid for most of the commercial riverfront area and through the French Quarter, many residents did not subscribe to the water system, but rather took water from the river, from public outlet pumps, or purchased it from the vendors.

Ordinances could legislate infrastructure usage, but one area of infrastructure upkeep was so contentious in New Orleans that debates on it precipitated the three-part division of the city.

The wharves, the commercial docking and cargo storage facilities for incoming and outgoing vessels on the Mississippi River, were essential to the city's economy. In the 1830s the riverfront at the French Quarter was not as active as that above Canal Street. The city administration was controlled by the "ancient population", the Creoles, who were unwilling to allocate improvement money to their rivals' wharves and continued to dedicate city money to the French Quarter wharf area ignoring the upriver portion. In addition, the batture – land between the levee and the water created by silt deposit – was growing above Canal Street thus necessitating even more improvement work. The American merchants and real estate owners of the needy area petitioned the City Council for assistance and were rebuffed. They then determined to ask the Louisiana Legislature to let them secede from the city, over the objections of one of their number, merchant Samuel J. Peters.²⁰

Peters, a Canadian, had come to the city as a young man and made his fortune. He was instrumental in the growth of the business area just above Canal Street, the Faubourg Ste. Marie, and was active in politics – while on the City Council he helped bring paved streets, sidewalks and improved levees and would initiate the first public schools. Peters was exactly the sort of businessman "booster" who was demanding and getting civic improvements in other cities at the same time period. When the Americans asked him to help get wharf improvement money from the city, he tried his best. First, the Legislature turned down the secession request. Only when the City Council rejected his demands and even refused to let him help finance the work for the city, did Peters begin the process of seeking a new City Charter. The resulting charter, like the New York City charter granted at the same period, set a new form of government and, in the case of New Orleans, resulted in the three way split.²¹

What New Orleans experienced was being experienced in other American cities. In Chicago, which received a City Charter in 1833, the financing of public improvements was equally important in fashioning the form of governance of the city. City government in Chicago for part of the mid-nineteenth century was “segmented.” Rather than the city government funding citywide services, services and infrastructure were provided only where those who would benefit were willing to pay. Thus, in New Orleans, if the Second Municipality and its landowners and merchants wanted improved wharves they would have to pay for improvements themselves or from their local revenues. Ultimately needs throughout an area might be great enough so that improvements throughout might have to be made with payment coming primarily from those best able to afford it: valuable property would have higher taxes but funds garnered from taxes might go for improvements citywide. Seen from the perspective that only those who benefited would pay, the decision to have separate municipalities for taxing and improvement purposes seems logical. But, across the country, change was coming to nineteenth century American city government. A mid-nineteenth century change in corporate structure of the city altered it from a licensed mercantile venture into a corporation charged with overall responsibilities for improvements for all the city’s residents, perhaps in a bow to Jacksonian Democracy. Next to evolve was the concept that the city corporation was constituted to serve as a conduit through which those with property could decide for themselves what was needed in the way of civic improvement and then obtain it.²²

A business question underlying the cultural Creole-American split involved railroads. New Orleans had installed a street railroad to the upriver settlement of Carrollton in 1835. (It is still in use today as the St. Charles Streetcar Line.) Another river-to-the lake line had built, but the main commercial transportation need of the city, as American businessmen saw it, was for a

rail line along the port that could connect with nationwide East-West rail traffic. The Creoles showed little interest in this, and the Americans remained frustrated by their recalcitrance but unable to build it without their support. This project, which would become the Public Belt Railroad for the Port of New Orleans, would not become a reality until the Progressive era at the beginning of the twentieth century. As early as the 1830s, the American business sector of New Orleans espoused many of the aims of later Progressives while being prime examples of the “boosterism” or commercial sector civic promotion that characterized Chicago in the same period.²³

The Americans in the Second Municipality would seem to have made the most civic progress during the three-way split era, but the Creole sector also saw improvement. While the Second Municipality was paying for their new headquarters to be designed by architect James Gallier (the building is known as Gallier Hall today), the Creoles managed to improve their civic center with private projects by developers. The Baroness de Pontalba, heir to the Spanish colonial landowner Don Andres Almonester, developed her row houses, the Pontalba Buildings, on either side of Jackson Square between 1849 and 1851, all within the three-way municipal division time period. In completing the buildings in record time and contributing to the restoration of Jackson Square, she not only created the classic New Orleans cityscape, she enriched herself in the process. The Baroness’s project had citywide connections, as she built her row houses, the Pontalba Buildings, in the First Municipality, “went to the Second Municipality for architects, contractors, and building supplies” and made payment from “profits gained from her Bayou Road property in the Third Municipality.”²⁴

The new Pontalba buildings would also house the popular opera star Jenny Lind on her New Orleans visit in 1851, and this publicity coup helped drive up the occupancy rate for unit rentals.

Despite the ecumenism of the Baroness, the prevailing reason for the split into separate municipalities was cultural antipathy. And, those little annoyances of language difficulties and differences in behavior could explode into mob violence. An 1836 argument between two men, “Giquel”, a Creole and “Brooks,” an American, progressed to an invitation to a duel by Brooks, followed by Giquel’s preferring charges against Brooks with the Recorder of the Second Municipality. The two men finally got into an altercation on Royal Street, in the Vieux Carre, and Brooks was killed. Giquel was arrested and charged with murder and arraigned before “Judge Preval,” who committed him to jail. Promptly a habeas corpus was issued and Giquel came before Judge Joachim Bermudez, a Creole jurist, who released Giquel on a \$15,000 bond. Shortly after this, a mob of Brooks’ American supporters stormed the home of Judge Bermudez. The Creoles were the victors. After the gunfight at the Judge’s home three Americans were dead and even Mrs. Bermudez acquitted herself well by defending the drawing room with her husband’s sword. Public opinion in both camps sided with the embattled judge and the controversy passed.²⁵

Press coverage of the events appeared in the New Orleans Bee, which was L’Abeille in its French edition. The Bee was a Creole paper serving as official printer for the First and Third Municipalities, and its reports were skewed according to language. The English edition, discussing the siege of Bermudez’s home, in a well written argument forcefully pointed out the anachronism in the American’s resorting to hooliganism over a judge’s ruling:

How can Americans talk of the beautiful system of their government, of the great moral spectacle of a nation governed alone by the restraints it puts on

itself, when every day's experience goes to prove the utter futility of such doctrines and that however plausible they may appear in theory, so far at least as our later experience proves, totally incapable of being reduced to permanent practice. There was a time when implicit obedience to the laws and ready compliance with their requisitions constituted the most prominent feature of the American people – when the slightest attempt to resist the constituted authority would have met with universal indignation, and when those whom the people had clothed with power were respected and sustained at the representatives of their dignity.²⁶

The Bee's French edition, meanwhile, was where the full story of Mrs. Bermudez's heroic gesture could be found, along with the fact that an officer of the Washington Artillery, to which Brooks had belonged, had offered his unit's services for guard duty over the judge to keep the peace. The French account ended with the immediacy of a breathless editor's note: "P.S. Two A.M. We have just left the printing press at this hour and there is no sign of any new disturbance. The town is peaceful."²⁷

The three municipalities, when their various inhabitants were not shooting each other, coexisted in an unequal balance. While the Second Municipality thrived with a growing economy and a relatively healthy treasury, the First Municipality suffered from inattention by its elected aldermen and perhaps less than responsible fiscal decisions by its Creole leaders. Symptomatically, the Second Municipality kept its funds in a bank, while the First Municipality used an iron chest, and the chest was more apt to be empty than full. The First Municipality, however, was where Mayor A.D. Crossman (1846-1854), a native of Maine, had begun his New Orleans political career. Crossman's work as an official of First Municipality had it, for at time, operating on a secure financial basis. The Third Municipality, home to immigrants and with little commercial activity, suffered most – what little revenue it might have depended upon from landowners' tax payments went mostly uncollected. Gradually the First and Third

Municipalities began to accumulate debt, and debt out of proportion to what they might ever be expected to pay back.

The separation of the city, as the Baroness Pontalba admitted in an interview with the Daily Delta, created only ill feeling and jealousy, while the lack of energy of the Creoles did the city little good. The Baroness, although a Creole herself, was businesswoman enough to recognize and identify an inadequacy wherever she saw it. That arch-Creole Bernard Marigny, speaking at the Constitutional Convention of 1845, ruefully commented on the Creole-American situation:

It [the Second Municipality] has struggled with herculean power to draw all the advantages from the old city.... [There exists] a feeling of rivalry, which has reached a point where there is no identity of interests between them. Far [be it] from me to say or insinuate one word in disparagement of the inhabitants of the Second Municipality. They have advanced with great strides. I admire their energy and indomitable perseverance, and what I wish is, that the old population which is so fast receding, would only be stimulated by their example.²⁸

The city, on its three unsteady legs, was beset throughout this period with the horrors of nature and the surrounding physical environment, both of which concerns forced additional demands for civic action. While little was accomplished, there was no shortage of ideas, in particular as concerned the city's drainage needs.

The New Orleans Drainage Company that was chartered for twenty years in 1835 received revisions to their charter in 1839. The company was charged with "draining and clearing" the 'marshy ground and cypress swamps' between the inhabited city and the lake. Its charter began by noting that "physicians of the greatest experience" believed that the city's epidemics were caused by "intense heat, and excessive humidity." While nothing could be done about the heat, its effects could be lessened by a "free circulation of air," and the humidity could be similarly lessened by "draining off the stagnant waters which accumulate on the low and

marshy grounds.” So, the 1839 Charter reasoned, if all the cypress trees between the city and the lake were cut down and the land drained, the epidemics would be assuaged. The company was capitalized at one million dollars, and both the city and state were to invest funds. The company was to “cause a plan to be prepared by an engineer” appointed by the president and the board. The original board of the company included Thomas Barrett, Charles Genois, A. B. Roman, Joseph Pilie, M. W. Hoffman, F. Gardere, James Hopkins, Albert Hoa, Frederick Frey, Edmond Forstall, James P. Freret and James H. Shepherd. The Legislature enabled the company to drain lands, appraise their value before drainage, and then force the landowners to pay the difference in appraised value after they were drained. Drainage improvements were made, especially in the area behind the First Municipality, the French Quarter, but there were problems. The provision requiring landowners to pay for improvements proved to bring out litigious tendencies in a number of citizens, corporations, and governmental bodies, resulting in years of litigation. The charter was revised in 1839 allowing landowners to take out a mortgage with the draining company rather than pay in cash.²⁹

The New Orleans Drainage Company’s 1839 call for an engineer to provide a plan for drainage did elicit plans. Unfortunately, those with the power to make decisions in this area also were prey to ethnic prejudice and disinclined to listen to technological schemes.

The idea of disposal of sewage by underground piping was actually proposed in to the company 1840 by a young engineer, George Dunbar. With a carefully drawn map of the elevation of the city’s environs, Dunbar showed how the elevations of the land could be used to facilitate drainage from the area near the river. He called specifically for subterranean sewers, five feet below ground, under Canal Street, Bienville Street, St. Louis Street and Orleans Street, with drainage out to holding pits and thence via canal to Bayou St. John and Lake Pontchartrain.

He supplied a map of the settled area of the city, showing canals and the area they drained. He provided a map of the elevation of the city between the river and the lake, the first such detailed map rendered. He advocated Dutch and English methods of draining marshes, surrounding them with dikes and using steam power to pump them dry. Dunbar wryly noted that it would take 150 years and \$22 million to fill in soil to elevate the sodden part of the city — but he estimated it would take only one year and \$45,000 to properly drain it using his plan. Dunbar's ideas were never completely implemented, although he had submitted full plans, including maps and cost estimates. The decisions about which expert to use were being made by the businessmen and elected officials of the city, then consisting of the three municipalities into which it split from 1836 to 1852. Why those decisions were made, and which expert might be favored seemed to happen randomly, bearing in mind that political connections no doubt played a part. In the matter of one expert, however, it is possible that racism may have been involved in the decision making.³⁰

Norbert Rillieux was the natural son of Vincent Rillieux (a white man, uncle of the painter Edgar Degas) and Constance Vivant (a free woman of color), born in New Orleans and baptized at the St. Louis Cathedral by Pere Antoine (with birth date given of October 17, 1808.) His father, Vincent Rillieux, was from a family of cotton brokers, and had invented a cotton-baling press. Perhaps he recognized scientific talent in his son.

Norbert Rillieux was educated in Paris, and by the time he was twenty-four was teaching applied mechanics at L'Ecole Centrale in Paris. Rillieux returned to New Orleans, began experimenting in devices to improve the manufacture of sugar, and in 1843 he was granted U.S. Patent Number 3,237 for his multiple effect vacuum pans for use in the process of granulating sugar. Like a line of connected pressure cookers, the device provided a fuel efficient means of

cooking sugar cane juice. Rillieux profited from his device and was well regarded in his field, even if he was not accepted socially in white circles in Louisiana. As the Civil War approached, life became more restricted for free people of color, and Rillieux returned to France, where he continued his engineering and other intellectual pursuits, although his finances suffered from European patent infringement. He died at the age of 85 in Paris, where he is buried. He was survived by his widow, Emily Cuckow.³¹

Rillieux apparently also devoted his scientific mind to the problem of New Orleans drainage, at one point drawing up a plan for draining the city. Rillieux is said to have claimed that his plans were blocked by the Louisiana Legislature at the behest of Edmond Forstall, a Louisiana sugar planter who had originally asked Rillieux to come to Louisiana from France to work on his sugar mill, but whom both Rillieux and his father Vincent Rillieux considered an enemy after there was a falling-out.³²

French sugar expert Horsin-Deon wrote to the Louisiana Planter and Sugar Manufacturer after the death of Rillieux, not only to praise his old friend, but to share facts about his life, since Rillieux was known for his anecdotes and stories. In his account, Horsin-Deon told of Rillieux's attempts to effect better drainage for New Orleans. Rillieux apparently went to Laurent Millaudon, a New Orleans landowner, and unsuccessfully urged him to form a drainage company. Rillieux then approached landowners in the area between the Faubourg Tremé and the lake, but did not persuade them to join either. Finally, he asked a city official, J. J. Mercier, a city attorney from 1838 to 1840, to propose the enterprise to the Legislature and ask them to create the company. Rillieux presented his drainage plans, but when the company was formed it was with Forstall, then a legislator, in control and he named another engineer to do the work.³³

Rillieux's version of the story strongly suggests that he was passed over for the role of engineer because of prejudice, whether it was racial prejudice or the result of the enmity between Forstall and Rilleux's father is unknown. In any event, an engineering report was requested from Dunbar. Yet, prejudice in New Orleans was not limited to race. Ethnic heritage might be grounds for discrimination. Rillieux was educated in France, and what allegiance he had in the city was to the French speaking community. Dunbar, although fluent in French, was an American and his education had been in Baltimore and in the eastern seaboard states. There is also the factor that Rillieux's French engineering training may have put him at a special disadvantage with Americans. Although the U.S. Military Academy at West Point began its faculty with French-trained military engineers, in a few decades the French were out of favor. French training may have been looked on with suspicion in some quarters, perhaps even in the increasingly Americanized New Orleans of the 1830s and 1840s. For whatever reason, Rillieux's drainage plans were not accepted by New Orleans, the plans do not seem to exist today, and his rejection rankled. It would not be the first, nor was it the last, time that a technician would not be allowed to function because those in power prejudicially decreed against it. ³⁴

Those in power were well aware that technical expertise might be needed at any time to keep existing systems in working order. While various schemes were being tried to solve the city's drainage problems in the mid-nineteenth century, the water system languished out of public interest. Besides complaints about poor service from the water company – which continued throughout its franchise period from 1833 to 1868 -- the waterworks reservoir near the river, erected in 1835 by Albert Stein, soon began to show signs of wear. The architect James Gallier described it as being “a large basin built in four compartments” set up on a mound of

earth. Gallier noted that the reservoir was so poorly constructed that, by around 1846, it held only two feet of water, rather than the necessary five feet for supplying the city, which prompted the management of the works to advertise for ideas on how the reservoir might be strengthened.³⁵

Much to Gallier's amusement, an Italian engineer proposed to build windbreaks, brick piers raised inside the reservoir, because "winds blowing across the basin produced waves that shook and destroyed the walls." Gallier submitted the approved plan, and set up "a series of iron bars round the outside of the basin, with diagonal tie-rods within" which would "give the walls counterbalancing support in every direction." Gallier reported that his plan was effective.³⁶

The ever efficient George Dunbar, meanwhile, would continue to put forth his ideas and expertise, even though he was not always well received by elected officials and the business community. In May of 1849 a new problem arrived when the Mississippi River, swollen by spring runoff in its upper reaches and invigorated by plentiful rains, broke through the levee seventeen miles above the city at the Sauv e Plantation, near today's town of Harahan. As the river gushed through the levee, the opening, called a crevasse, widened. The Sauv e Crevasse would be well over three hundred feet long at its widest, but even when it began as a tiny fissure, the water poured relentlessly in to the saucer-like land where the city was situated.

Remarkably, the crevasse and flood had been predicted by Dunbar, then on staff as Surveyor of the Second Municipality. A native of Maryland, Dunbar had previously served as an engineer planning a railroad line north of Lake Pontchartrain besides his work for the New Orleans Draining Company. In 1849 Dunbar was requested by Mayor A.D. Crossman to join with the Surveyor of the First Municipality, Louis B. Pilie, in making an inspecting of the river levees.³⁷

Dunbar issued his report in a letter dated March 1, 1849. The levees were in uniformly bad shape. At the Faubourg Bouligny (near today's Jefferson Avenue) the levee was leaking and needed work. In Carrollton (near today's Carrollton Avenue) the citizens had removed the back of the levee to strengthen the front, and had weakened it overall. The levee was in especially poor condition near "Hoey's works" (a few miles above Carrollton in Jefferson Parish.) Dunbar strongly stated his case: the levees were in deplorable shape, and nothing had been done.

Exasperated, Dunbar wrote

. . . the Councils will go on dreaming of their security until they find one half of the city and suburbs engulfed and millions destroyed, they will then regret that ample means were not taken for our security.

I feel it my duty, sir, to plainly state that the authorities of this city and Lafayette and other suburbs are trifling with the property and lives of our citizens, and Sir, although I wish to create no panic or cause uneasy alarm, I say the time is not far distant when they will regret it. It may be years before a crevasse will take place, and it may occur within a few days -- the latter the more probable.³⁸

And then Dunbar made an unorthodox, but intuitively creative, suggestion: spend money to build a spillway from the river to the lake above New Orleans to allow overflow during high water and protect the whole region as well as the city.

Say it cost \$150,000 or \$200,000 -- what is the cost compared with the safety of our lives and property, and that not only that of our city, but for two hundred miles in extent of the fairest and wealthiest region of this earth? Put it to vote, and this city alone will bear cheerfully the expense.³⁹

Only after the flood of 1927 would the Bonnet Carre Spillway be built to accomplish what Dunbar envisioned. In the meantime, he advised the Mayor that he could build a ring levee around the city for about \$8,000 to \$10,000 and he recommended it be done quickly, and noted, "If this will not protect us, nothing will."⁴⁰

The reaction of the Second Municipality, Dunbar's employers, was swift. Samuel J. Peters denounced him and called him "presumptuous and disrespectful." At this point the

business community was not ready to support an expensive improvement project. Peters denied that the scheme for an overflow channel was necessary – in fact, he had been advised against this sort of thing in an 1841 letter on the Mississippi River set him by engineer Albert Stein. Peters strongly felt that this type of expenditure, even for the ring levee, was not needed and stated that such flooding was neither probable nor possible. He then castigated Dunbar for his audacity in making such suggestions.

The surveyor should have confined himself to his duties, he should have stated facts, and given such professional advice as the occasion called for and not taken upon himself to censure the authorities of the two cities and advise the mayor on the wishes of the people of New Orleans⁴¹

Peters also took pains to let Dunbar know that he and his report could expect little respect from officials. Moreover, Peters gave little weight to the recommendations, even though they had been made by Dunbar, an employee of the municipality. Businessman John McDonogh, later known for his bequest to the public school system but at the time revered mostly for his parsimonious financial acumen, was then cited as a competent authority. McDonogh thought a levee from the river to the lake above the city would provide sufficient protection. While Peters also saw no need for this project, or for any other flood control spending at the time, he took McDonogh's idea seriously, as he noted

... [McDonogh's] experience in levee matters and the interest he had at stake entitled his opinion to as much respect as the Surveyor's.⁴²

When it came to deciding what civic improvements the Second Municipality needed, Peters considered his own opinion, or that of another businessman, as the only ones that counted – relying on outside experts was definitely not on his agenda. The mixed reaction to Dunbar – he is both praised and derided during his fight to close the crevasse – is, in fact, reflective of the dual views of technical professionals held by those in power in American cities at the time. The

engineering profession was just beginning to be defined, and engineering education was beginning to be offered at non-military institutions. The mid-nineteenth century saw the emergence of the technical professions, but it would not be until the Progressive Era, toward the end of the century, when the trained professional fully gained respect. As forward thinking as Peters and his fellow “boosters” were, perhaps they still were prey to Jacksonian era doubts about those who set themselves above the common man, the expert who thought himself better than the man with practical experience.⁴³

Peters had other business reasons to be against Dunbar’s suggestions: his bank held mortgages on the company operating the old Carondelet Canal and Dunbar’s suggestion of allowing river water to divert to the lake might harm the canal’s chances of solvency. In 1850, Peters, as president of the Louisiana State Bank, wrote the directors of the Orleans Navigation Company who were operating the old Carondelet Canal, assuring them that their corporation was about to become insolvent, and that its toll receipts were “inadequate to keep the navigation of the Harbor, Bayou and Canal in a condition to entitle your company to retain the valuable perpetual privileges conferred upon it by its charter.” Peters then presented them with an engineering report giving a cost of \$268,195 for the necessary improvements to the canal and adjacent structures. The shell road tow path needed to be three feet higher to withstand high water, the draining machine at the bayou was filling it with sludge and needed to be moved closer to the lake, dredging was long overdue to keep the canal at proper depth.⁴⁴

The impetus behind the report was rivalry with the success of the Orleans Canal, usually known as the New Basin Canal. That canal, built in the 1830s above the American sector of the city, had, according to the report, seven times the commerce of the Bayou route, and was attracting builders and property speculators to its adjacent land.

The engineer, M. Harrison, in a report dated February 20, 1850, stressed the needs of the city for drainage and flood protection. Harrison noted that a crevasse at Bonnet Carre (in the same location as today) was currently filling the lake with water. The city, according to Harrison, needed more levees to protect it from both the river and the lake. In fact, diverting river water to the lake would be disastrous, he asserted. Some plans for flood prevention “if carried out, materially affect the success of your enterprise” and would result in “heavy additional expenditures.” And, “if the Mississippi be tapped above New Orleans, so as to throw its swollen waters into Lake Pontchartrain”, then “the only remedy for such an evil is proper drainage.” Only adding additional levees, at the lake and between the lake and the river to protect the city, plus the relocation of the drainage machine nearer the lake, would suffice, he contended.⁴⁵

What little action was taken on Dunbar’s 1849 suggestion to build levees and construct a spillway at Bonnet Carre was hampered by the fact that not only the three municipalities had to set up committees to act on it, the city of Lafayette, adjacent to the Second Municipality, plus the joint upriver communities of Freeport and Carrollton, and the Police Jury of Jefferson Parish all had committees, also, and would all be expected to pay a proportionate share of the expense.

When the crevasse came, on May 4, the levee at the Sauv  Plantation above the city began to collapse quickly. Dunbar, whose predictions about the break were wrong only regarding the exact location, approached from the city with what force he could muster, but the break was too large and the river too swollen for him to do much in the way of repair. The waters rushed in to the back of the city, and gradually moved into the inhabited areas.

The reaction to the incoming flood was swift. The Second Municipality inhabitants busily began trying cut into the levee along the New Basin Canal so some water would drain off

into the Third Municipality, and an attempt was made to cut into the Metairie Ridge (a natural high area, at Metairie Road today) to drain more water into the lakefront swamps. Inhabitants of as yet unflooded areas defended their levees with a will. The police vainly attempted to keep order. The water continued to rise, and at its worst, the depth of the flood ranged from six feet at the back of town (nearer to the lake) to a few inches near the river. Above Canal Street, the floodwaters extended to Carondelet Street: below Canal Street, water extended as far as Bourbon Street. The officials of the First Municipality passed resolutions thanking donors for providing tents for the homeless in Jackson Square. They then approved the purchase of lime to sprinkle in hopes of smothering odors as soon as the waters might recede. And, as usual, they made plans to borrow money to pay their share of the costs.⁴⁶

Meanwhile, the flood continued and the crevasse had not yet been closed. Dunbar had ample supplies and labor, but the problem of closing this crevasse was a difficult one. The usual method of dealing with a crevasse was to build a circular interior levee, or plug levee, on the land side to dam in the floodwater coming in through the break, and then to wait until the river level subsided so the original levee could be rebuilt when the backwater flood level had lowered. Dunbar's problem was that the break was so large and the flood waters deep so far inland that he was unable to construct the plug levee. Sinking a ship at the original levee break point did not help, either. Dunbar's workforce on May 14 was described in the Weekly Delta by Carrollton resident John Ham[p]son as comprising "one hundred sixty white men, five hundred negroes, and two steamboats". The effort was to no avail and the crevasse grew wider. The Weekly Delta knew where to lay the blame for the crisis:

This city has been subjected to the great injury of an inundation by the palpable and shameful neglect of the municipal authorities.⁴⁷

Engineering problems aside, Dunbar had to content with a doubting public and an impatient bureaucracy, plus an outpouring of ideas on how the gap might be closed. Helpful letters to the newspaper increased, and reports of practical, rather than scientific, methods of closing crevasses were abounded. While his own employers, the Second Municipality and its aldermen, might doubt his worth, Dunbar, and the ranks of technical professionals, did have support from journalists. The Weekly Delta noted on June 4

Why should we be surprised that ...at every corner of the streets...there should proceed men confident in their utter ignorance of science and therefore by the logic of our municipal authorities [confident also] in their ability to stop the Crevasse? ... The most vulgar of all prejudices is that which regards men of science and learning as unfit for great works, on which the principles of science are carried into practical operations.⁴⁸

In fact, The Weekly Delta, while it put value on professional training, had little use left for the politicians it blamed for leaving the city under water:

Let our aldermen stay at home and paddle their own canoes, taking care to forward the necessary supplies to the engineers at the crevasse, confining their appetite and wisdom to turtles and taxes.⁴⁹

The city authorities, fickle as ever, still did not trust Dunbar completely and Peters called in a Captain Grant from Mobile. A few days in New Orleans and Captain Grant gave up, leaving his efforts at building an interior dike woefully incomplete. Excursion boats to view the crevasse scheduled regular trips and crowds flocked to the new attraction. As late as June 8, The Brooklyn Eagle in New York noted despairingly:

All hopes of stopping the breaches in the levee at New Orleans have been abandoned till the river falls. The city is deeply inundated and the water continues to rise. This is a very great calamity.⁵⁰

In the end, it was Dunbar who managed to close the break. Using two pile drivers, and filling in with willow logs and mats, the dependable fascines, he created an interior circular levee, joined it to what little Captain Grant had built, and gradually the water subsided so the

levee could be closed. The work was completed shortly after June 20, and Dunbar received belated congratulations, even though few if any of his recommendations for preventive measures were carried out later. Citing Dunbar's "displayed talent, zeal, energy, untiring industry and a devotion to his duties," and noting that he had suffered from poor health during much of the work, The Weekly Delta recommended that he receive "an enduring token of the approbation of his fellow citizens." There is no record that his approved reward of \$2,500 was ever paid in full.⁵¹

Dunbar himself was one of those who suffered in the flood, and it was only the first in a series of misfortunes concerning him. His home in the Second Municipality faced Gravier Street on the lakeside of Claiborne Avenue. The water would have been over his land for six weeks or more. Dunbar was a naturalist and a humorist, contributing essays on the outdoors and stories about the fictional Louisiana woodsman "Antoine," to a nineteenth century New York magazine, The Spirit of the Times. Dunbar was a keen observer of nature, deplored the devastation of cypress forests by timber interests, and despaired that Indian shell mounds were being mined for building material instead of revered as monuments. His flood-ruined gardens had contained over two hundred camellia plants, as well as hotbeds, a greenhouse, and an "igloo-shaped gazebo." His health broken, his garden in ruins, Dunbar fulfilled his city obligations and then took a job as a surveyor on a project to build a railroad across the Isthmus of Tehuantepec in Central America. He died December 29, 1849, on board the survey steamer Alabama, anchored off the coast of Nicaragua. Dunbar's papers, his nature studies, his classification of American fish, with his own drawings, all perished in an 1857 fire at the boarding school in Maryland where his widow, Caroline Eliza Dunbar, was headmistress. The remaining collections he had assembled became the property of his daughter, Fanny Dunbar Corbusier, and were stored in San Francisco while

she accompanied her army surgeon husband to the Philippines on a tour of duty. Dunbar's last possessions were destroyed in the 1906 San Francisco earthquake and fire.⁵²

New Orleans slowly began to recover from the flood. The suffering of the people had been extreme: a June 4, 1849, map of the flooded area on the front page of The Weekly Delta showed the extent of the devastation, and gave an estimate of 8000 homeless and 1600 flooded homes. By June 18, 1849, the newspaper, with the end of the disaster in sight, reiterated its disgust with local elected officials, accusing them of "bad management and incompetency" and said they were selected without regard to "official fitness," but because "they are good, amiable, popular folk." After recounting the shortcomings of politicians, The Weekly Delta aimed at what it saw as the root cause of New Orleans' problems: the division of the city, calling it "a defect that renders this city an easy prey to any great calamity."

A fourth rate city in size, New Orleans is divided into three moderate towns, each separate and independent in its powers and functions, with an anomalous and almost merely nominal connection or general head.

We have for a hundred and twenty thousand inhabitants no less than four municipal legislatures -- a Mayor, with scarcely any powers (and these badly defined) and three sets of administrative Officers. The whole system is anomalous, confused and inefficient.

The utter want of combination in encountering the two great calamities which have lately visited us -- the Cholera and the Crevasse -- should turn the minds of our citizens to the necessity of changing and reorganizing our whole municipal government.⁵³

New Orleans' years of municipal separation were called "a curious experiment in city affairs" and "the idea of local self government pushed to an extreme" by political scientist William W. Howe in an 1889 study of the city for Johns Hopkins University. Howe pointed out that the three part system "afforded many opportunities for corruption and extravagance" and that "large floating debts were contracted." Finally, it was the debt that caused the split to heal.⁵⁴

The 1849 flood had several consequences besides depleting the municipal purses. One result, which actually aimed to do something about the Mississippi River, was Congress's Federal Swamp and Overflow Land Act of 1850, in which the states received federal swamp and marsh lands which could then be sold with the proceeds allocated to flood control. Louisiana would receive 8.5 million acres. Various commissions were set up on local, state, regional and national levels to begin looking into flood control issues. Other than bolstering Louisiana's system of politically controlled levee boards, little was actually accomplished. The flood, however, and its incumbent debts, would force union on the somewhat unwilling parties in the city's divisions. By 1852, the debt of the entire city would have reached \$7,000,000, \$2,000,000 of the total due immediately and with no resources available for payment. The Second Municipality had credit rated at par – it could issue bonds for funding. The other two municipalities were approaching bankruptcy. The condition of the city's infrastructure was abysmal. With no money the streets went unrepaired, the police became corrupt, and levee building recommended by Dunbar was unfinished. Something had to be done. The Creoles were urging union, and this time it was the Americans who were coy.⁵⁵

The point of contention was still that the Creoles, with their recent immigrant friends voting with them, would control the city by sheer numbers and this was anathema to the Americans. But, by 1850, the New Orleans legislative delegation had offered a plan of civic union to the Louisiana Legislature. The Legislature insisted that only if the citizens were in favor of it would a new city charter be issued. In the voting of April 8, 1850, the measure went on the city ballots, with the Second Municipality strongly opposed and enough votes against it elsewhere to defeat the issue. A.D. Crossman, whose term as Mayor had begun in 1846 and lasted through the flood, ran for re-election a few weeks later on a platform advocating

consolidation. Crossman, whose original political strength came from the First Municipality, and who at this point would have been approved by the Whig party, the party of most American businessmen, was victorious. The actual union of the city would take place only in 1852, and the action which precipitated it would come from the little city of Lafayette, the Garden District of today, just upriver from the Second Municipality and predominately American. Lafayette voters were in favor of consolidation with their city included: thus the three municipalities plus Lafayette would have an electorate with an American majority.⁵⁶

The Creoles were against this plan, seeing it as a loss of control for them, but finally acquiesced and the re-unification of New Orleans was approved. In the final instance, it was finances that carried the day. The final plan decreed that the three municipalities would share the burden of the city debt proportionately according to their pre-union indebtedness, that of 1836. In the unified city, the new alignments came not only from cultural groups and from regional areas, but from political party alliances. The Creoles and immigrants generally favored the Democrats. The Whigs were the party of businessmen. However, as with A.D. Crossman, there would be those whose appeal crossed party lines. And, the Know Nothing party would have its adherents; especially as the Whig party nationally began to decline. As the Civil War approached, New Orleans overcame its financial difficulties and party politics kept elections interesting.⁵⁷

As far as the levees and the Mississippi River were concerned, very little was done through the 1850s, and no care was given at all during the Civil War. George Dunbar's imaginative plan for a river-to-lake outlet above New Orleans would ultimately be built after the disastrous flood of 1927. The new structure, the Bonnet Carre Spillway, would open for the first

time in 1937 – barely a century after the great schism in the city of New Orleans that it took a flood to heal.⁵⁸

End Notes

¹ Spraul-Schmidt, p i

² Spraul-Schmidt, 50-61; Henry Rightor, Standard History of New Orleans, Louisiana (Chicago: Lewis Publishing Company, 1900), 96 ff

³ Spraul-Schmidt, 50-61.

⁴ Judith K. Schafer, “Reform or Experiment: “The Louisiana Constitution of 1845”, in Warren M. Billings and Edward F. Haas, eds. In Search of Fundamental Law: Louisiana’s Constitutions, 1812-1974. (Lafayette, La.: University of Southwestern Louisiana, Center for Louisiana Studies, 1993), 29-31; note 29, Robert J. Ker, rep, Proceedings and Debates of the Convention of Louisiana (New Orleans. 1845) 11-18

⁵ Schafer, 22

⁶ Rightor, 97

⁷ Rightor, 98-9

⁸ Rightor, 98-9; Thomas Ewing Dabney, 100 Years: The Canal Bank and Trust Co. of New Orleans New Orleans: Canal Bank and Trust Company, 1931), pp 8-1; George D. Green, Finance and Economic Development in the Old South: Louisiana Banking, 1804-1861 (Stanford, Calif.: Stanford University Press, 1972). p 22-25.

⁹ John Smith Kendall, History of New Orleans Volume I, (Chicago: Lewis Publishing Company, 1922) 138-9

¹⁰ Kendall, footnote 19, p 139, 147-8.

¹¹ _____ Digest of the Ordinances and Resolutions of the Second Municipality and of the General Council of the City of New Orleans Applicable Thereto January, 1848 Compiled by Order of the Council, By F. R. Southmayd, Secretary, (New Orleans: Printed by Wm. H. Toy, 1848.), 34.

¹² Ibid., 64, 45.

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- ¹³ Ibid., 54-5.
- ¹⁴ Ibid., 60, 77-84. 87.
- ¹⁵ Ibid., 87, 102.
- ¹⁶ Ibid., 271.
- ¹⁷ Ibid. 385.
- ¹⁸ T. W. Collens, Compiler; Revised by G. Morel. Analytic Digest of the Acts of the Legislature Now in Force Constituting the City Charter of New Orleans, (New Orleans: Auguste Brule, 1846), 229-230.
- ¹⁹ Ibid., 230.
- ²⁰ Kendall, 137.
- ²¹ Kendall, 137; Leonard Huber, New Orleans: A Pictorial History, (New York: Crown Publishers, 1971), 167.
- ²² Robyn L. Einhorn, Property Rules: Political Economy in Chicago, 1833-1872. (Chicago: University of Chicago Press, 1991), 51-55, 104.
- ²³ Einhorn, 28-60; Christine Vella, Intimate Enemies: The Two Worlds of the Baroness de Pontalba, (Baton Rouge: Louisiana State University Press, 1997) 252-273.
- ²⁴ Vella, 263.
- ²⁵ Kendall, 136-7; Henry C. Castellanos, New Orleans As It Was: Episodes of Louisiana Life, (New Orleans, L. Graham and Son, Ltd., Printers, 1895), 260-264.
- ²⁶ New Orleans Bee, 7 September 1836
- ²⁷ New Orleans Bee, 7 September 1836; L’Abeille, 7 September 1836. The French quotation is: “*P.S. 2 heures du matin – Nous venons de quitter l’imprimerie et jusqu’a cette heure, il ne s’est manifesté aucun signe de nouvelle émeute. La ville est tres tranquille.*” The account in Castellanos and in Kendall is taken from L’Abeille.
- ²⁸ Vella, 269-273; Kendall, 145-161; The New Orleans Daily Delta, 8 December 1850; Schafer, 29 note Journal of the 1845 Convention, 11-18.
- ²⁹ _____ Charter of the New Orleans Draining Company (New Orleans: Brusle and Lesseps, 1839) 1-34.

³⁰ George Dunbar, Rapport de Mr. Geo. T. Dunbar, Ingenieur de l'Etat de La Louisiana, Adresse a Mr. Felix Garcia, President de la Compagnie de Desessechement de la Nouvelle Orleans, (New Orleans: Brusle and Lesseps, 1840.) 1-20; Roger Baudier "Sanitation in New Orleans" tenth in series, Southern Plumbing and Heating Retailer, New Orleans, La., August 1955, 11,12,17,18. Roger Baudier was predominantly a historian of the Catholic Church in New Orleans, but between 1955 and 1957 he published a series of 32 articles on the history of "Sanitation in New Orleans" in a plumbing industry magazine. The articles are not annotated, but appear to be well researched.

³¹ George P. Meade, "A Negro Scientist of Slavery Days," The Scientific Monthly, April 1946, Vol. LXII, pages 317-326. Rillieux's tombstone reads: "Ici reposent Norbert Rillieux, ingenieur civil a Nouvelle Orleans, 18 Mars 1806, decede a Paris le 8 Obre 1894 Emily Cuckow, Veuve Rillieux, 1827-1912"

Rillieux's multiple effect vacuum pan was "not merely a change from a manual operation to a mechanical one," it was a "complete overturn in theory, practice and method" from a process that had changed little over centuries to one which is still in use today. George P. Meade, "A Negro Scientist of Slavery Days," 317-326. Rillieux's pride of place as the inventor of the multiple effect vacuum pan system was championed by Paul Horsin-Deon, nineteenth century French engineer, an authority on sugar production. "*Nous pouvons dire des maintenant qui toute cette grandiose conception, due entierement a M. Rillieux, est encore la base des appareils actuels, sans que rien n'y ait ete change depuis*". Paul Horsin-Deon, Le Sucre et L'Industrie Sucriere, (Paris: Bailliere et Fils, 1894)193-200

³² Paul Horsin-Deon, Le Sucre et L'Industrie Sucriere, (Paris: Bailliere et Fils, 1894,)93-200, 322.

³³ Louisiana Planter and Sugar Manufacturer, November 24, 1894, 331; Works Progress Administration, Mayors of New Orleans: 1803-1936. Compiled and Edited, Project 665-64-3-112, New Orleans City Archives, New Orleans Public Library

³⁴ Waring and Cable, History and Present Condition of New Orleans, 55; Todd Shallat, Structures in the Stream: Water, Science, and the Rise of the U.S. Army Corps of Engineers (Austin: University of Texas Press, 1994) 34-42.

³⁵ James Gallier, Autobiography of James Gallier, Architect, (Paris: E. Briere, 1864), 35, 36.

³⁶ James Gallier, Autobiography of James Gallier, 36.

³⁷ Nancy Knox, unpublished article "The Longer View: George Towers Dunbar, 1812-1848", MS2407, The George Towers Dunbar Papers, Maryland Historical Society, Baltimore Maryland; Harry Kmen, "New Orleans Forty Days in '49" in The Louisiana Historical Quarterly, Volume XL, Number 1, January 1957), 25-45.

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- 38 Journal of the Deliberations of the Council of the First Municipality, 1845-1850. Bound volume, p 88-89 pages not numbered consecutively) Special Collections, Jones Library, Tulane University.
- 39 Journal of the First Municipality, 89
- 40 Ibid. 89. Dunbar was possibly the first practicing engineer to suggest this solution to Mississippi River flooding, but he has received no credit for this, and is not included in John Barry's major study of flood control of the river. John Barry, Rising Tide: The Great Mississippi Flood of 1927 and How It Changed America. (New York: Simon and Schuster, 1997) 34-35
- 41 Knox, 28-30; The New Orleans Weekly Delta, 5 March 1849; Albert Stein, Letter to Samuel J. Peters, esq., President of the New Orleans Chamber of Commerce, in Relations to the Improvement of the Navigation of the Mississippi River., (Philadelphia: J. Perry, February, 1841,)
- 42 Weekly Delta, 5 March 1849.
- 43 Knox, 29; Barry, 21 ff; Kmen, 28-39
- 44 Samuel J. Peters, Letter of the President of the Louisiana State Bank to the Board of Directors of the Orleans Navigation Company: with Reports of M. Harrison, Civil Engineer, on the Contemplated Improvements of the Canal Carondelet and Bayou St. John. (New Orleans: J. B. Steel, 1850), 1- 11.
- 45 Samuel J. Peters, Letter of the President of the Louisiana State Bank, 8-11.
- 46 Journal of the First Municipality, 112-113
- 47 Weekly Delta, 14 May 1849. The report of the method used by a "free colored man named Fleming" who was damming a small crevasse in Carrollton described what Dunbar was attempting on a larger scale.
- 48 Weekly Delta, 4 June 1849
- 49 Ibid.
- 50 The Brooklyn Eagle, 8 June 1849; Weekly Delta, 4 June 1849. Kmen, 40-45.
- 51 Weekly Delta, 18 June 1849. Kmen, 40-45
- 52 Knox, 1-5; Sally Kittredge Reeves, Jacques-Felix Lelievre's New Louisiana Gardener, (Baton Rouge: Louisiana State University Press, 2001) illustration.
- 53 Weekly Delta, 4 June 1849, 18 June 1849

⁵⁴ Howe, William Wirt Howe, Municipal History of New Orleans John Hopkins University Studies in Historical and Political Science, Herbert B. Adams, Editor (Baltimore: Johns Hopkins University Press, 1889) 15-16.

⁵⁵ Leon C. Soulé, “The Creole-American Struggle in New Orleans Politics, 1830 -1862” in The Louisiana Historical Quarterly, Volume XL, Number 1, January 1957) 56- 60; Carolyn Kolb, The System That Works to Serve Our State (New Orleans: Louisiana Association of Levee Boards, 1990) p 11.

⁵⁶ Soulé, 54-65.

⁵⁷ Soulé, 54-65

⁵⁸ Soulé, 54-65; The System that Works to Serve Our State, 12-13.

Chapter 7. Un-Reconstructed City: Looking Back From 1880

At the end of the 1870s New Orleans found itself shattered, its services and facilities ill maintained, inadequate, and in poor condition. The post-Civil War period of Federal governance of the state and city may have been called Reconstruction, but that term was misleading: little had been improved or built anew since 1850. By 1881 there was a well-documented and appalling record of decades of poor service by the systems through which New Orleans brought in a water supply, drained its streets, and neglected to deal with sewage. Those decades also saw recurring epidemics, due in no small part to the city's inadequate water infrastructure. The city's problems were obvious, but it fell to a journalist, fiction writer George Washington Cable, writing in the 1880 United States Census, to make a public outcry over the disgraceful situation. Cable took upon himself the power to criticize and to urge improvement. Illuminating what had gone into creating the situation he found, how the drainage system and water works existing in 1880 came to be, the way the city reacted to disease, shows the extent of the city's problems, both with infrastructure and with the governance that had allowed such unsatisfactory systems to be created and continue to exist. That Cable could have the power to force the city to consider change was a mark of how far New Orleans had progressed toward modernizing itself.

Those who lived in the city of New Orleans during the mid-nineteenth century well knew that water was a problem. The ground was sodden after rains, what water there was to drink was cloudy river water or equally dirty water from shallow wells, the river or lake might overflow, the nearby swamps were wet year-round, the canals and the gutters along the streets were fetid, and there was no way for water to leave until it evaporated or sank into the earth. While there might be the occasional enlightened person of scientific bent who had an idea for a solution to

one or the other of the water problems, the decision on whether to undertake which projects rested in the hands of those with power. Power, over the years, had moved from appointed colonial administrators with authority from European governments, to officials of the American era, some appointed, some elected. As the town prospered in the beginning of the nineteenth century, the merchant class, with vested interest in property and money in the local economy, took on power to influence public works decisions.

Throughout the nineteenth century the press had given a voice to those wishing to influence the decision makers. Newspaper writers could chide, expose, rant, and cajole. But, it was George Washington Cable, best known as a writer of fiction, who both expressed current opinion and added his own urgent warnings that New Orleans was in desperate need of solutions to its problems of sanitation, and that projects involving water were the prime requisites for bringing the city to economic health. With Cable, power moved to the writer's pen, and his incisive commentary both chronicled and exposed the problems of the prior decades, while it also served as an urgent call to action for those who would work for change in future years. Cable's writing may have annoyed, but it also prodded, and helped create a climate of public opinion in which changes could be made in the future.

One of the products of the 1880 United States Census was a volume on the History and Present Condition of New Orleans, Louisiana. Data for Austin, Texas, was included in the book, and the "Expert and Special Agent" in charge was George E. Waring, Jr. Waring was best known as a sanitary engineer and for his work on the sewer system of Memphis, Tennessee, and he was certainly an expert on urban infrastructure. Cable's contribution to the work was as a special "Assistant for New Orleans."¹

George Washington Cable was a native Orleanian writer of fiction who had endeared himself to the literary world (if not to all residents of his home city) with his tales of the Creole culture and racial animosities of his hometown. By 1881, when the census volume came out, he had seen the publication of his two best-known works, a selection of short pieces, Old Creole Days, in 1879 and the novel, The Grandissimes, in 1800. In 1885 he would leave the city for Northampton, Massachusetts, and never return to live. In 1881, Cable produced the “careful and elaborate historical sketch with which the report is introduced,” according to Waring’s front note.²

Cable’s succinct summation of the problems of the city in the mid-nineteenth century included his opinion that “New Orleans had depended too entirely upon the mere movement of crops,” that the “cultivated classes of the south” were ‘opposed to mercantile pursuits,” that the “sanitary conditions of the city had been overlooked,” and that little was done to improve movement of goods and lower port charges. Slavery had also been detrimental to the economy of the city, since the liberty of “northern workingmen” resulted in more “practical thinkers” in that region. Besides a lack of skilled workmen, there were few if any factories to employ them. The city was further handicapped by the fact that American business acumen, determination and pluck was disparaged by the “unaspiring and satirical Creole,” Cable insisted.³

Cable castigated the city of New Orleans for its failure to provide good services to its citizens. “Public burdens are but feebly recognized,” he pointed out. “Private extravagance still makes public parsimony,” he charged, chiding the pleasure loving citizens with neglecting needed modernization of city infrastructure. In addition, there was still little notion of a work ethic in 1881. “The uneconomical habits of the south have not passed suddenly away with its

change of the labor system,” Cable carped. As Cable saw it, the abolishing of slavery did not bring about industrialization or result in a qualified work force.⁴

One water problem of the city had been solved: the opening of the passes at the mouth of the Mississippi River. Finally, Captain James B. Eads of St. Louis convinced the U.S. Congress in 1875 that he could open the river by use of jetties, walls on its sides at the mouth of the river, to constrict the flow and let the force of the river clean and deepen its own bed. Eads “met with strenuous opposition,” Cable related, but he was so sure of his method he offered to do the work and keep a 30 foot channel open for 20 years, with the government to begin paying him when he had the watercourse deepened, and hire his firm for 20 years of maintenance. He succeeded, exactly as Albert Stein had predicted over a quarter of a century before. Eads even used fascines, willow mats, to set a base, then gradually built his jetties with concrete from there. Eads’ jetties were an engineering marvel, and although the problem of maintaining the works continued, New Orleans could finally rejoice in the solution of a major water infrastructure problem. In this case, science – the technician – alone assumed the power to enact infrastructure change, those with decision-making power in this case having willingly transferred to him that privilege, in return for not having to finance the attempt.⁵

Apart from questions about the river, New Orleans’ worst problem was its “notorious insalubrity,” the general unhealthiness of the city. This could be ascribed to its preponderant “condition of saturation and filth.” Cable managed to convey his sense of outrage, horror and pity at the desperate health situation of the city. “Nothing could have been more obvious” than the “insalubrity of the site chosen for New Orleans,” Cable insisted. From the vantage point of 1881, he saw few improvements: open drainage canals were “ill-placed, poorly constructed and entirely neglected,” efforts at surface drainage were “defective;” a system of public garbage

removal was “better than none.” He noted a plague of rats from 1837 to 1840 that “defied extermination.”⁶

The state of the public’s health was more horrendous by far than these distasteful factors alone indicated. The city, since its beginnings, had been hit with epidemics: most notably cholera and yellow fever.

The two diseases both had a high mortality rate. Yellow Fever was transmitted by the bite of a mosquito. The disease entered the blood stream: sufferers’ body temperature soared, their skin turned sallow, and the black vomit of victims was a telltale symptom. Only at the very end of the nineteenth century would the vector of the disease be identified as the mosquito — and only in 1905 would New Orleans finally enact necessary programs to stop the breeding of mosquitoes and the regular recurrence of the disease. Yellow Fever had been a scourge to the city since colonial days. Regular re-infections of the city came from travelers every summer — with the exception of the years of the Civil War blockade of the port, which stopped the flow of visitors and their attendant ailments.

Yellow Fever epidemics were terrifying, especially since they seemed to follow their own course. Burning tar and firing canons did not stop the disease. Cable noted that physicians even claimed that New Orleans’ noisome garbage might somehow repel the sickness. Cable asserted that the members of the business community of the city were bent on denying any health problems and broadcasting a “persistent reiteration of the city’s salubrity.” Notwithstanding this civic inaction, the discovery that the mosquito was the carrier would not come for decades.⁷

Cholera, a fierce diarrhea that killed by dehydrating sufferers and causing shutdown of the kidneys, was passed from person to person by a microbe present in feces and most often caught from a contaminated water supply. The bacillus itself would not be discovered until

nearly half a century later, but by the time Cable wrote, it had long been proven that bad water could spread this disease. Sir John Snow was an English physician and scientist who carefully made observations about the cholera epidemic that ravaged London in 1849. That year he published a pamphlet, "On the Mode of Communication of Cholera", tracing the occurrences of the disease to the use of a contaminated water supply. By his reasoning, the feces of the infected persons carried the infection to others, and since the water supply was coming from ground contaminated by sewage, water could spread the disease. Snow published a longer version of his theories in 1854, and in 1856 a government report confirming his findings appeared in the *British Journal of Public Health*.⁸

Contemporary physicians in Louisiana were apparently ignorant of Snow's research findings at that time, and they also seemed never to have read the 1842 study by Edwin Chadwick, *The Sanitary Conditions of the Labouring Population of Great Britain*. While New Orleans doctors recognized that somehow bad drainage and general filth contributed to illness, there was no coherent connection made that something (a microbe, a germ, a bacillus) might be passed from one person to another, whether by direct contact or through contaminated water.

Ironically, scientists themselves, when given the power to make decisions on which scientific methods to use, will sometimes ignore new possibilities. Snow was not such a man: when he learned of the use of ether as an anesthetic in America in 1846, he immediately began experiments in London and made improvements in its use, and was also quick to accept that chloroform might be a better anesthetic drug. Snow had an open, inquiring mind, and was ready to accept new scientific thought. The physicians of Louisiana, for all their good intentions in seeking a cleaner, drier city, were not quick to recognize a new scientific theory they had the power to adopt and champion.⁹

Cholera spread in waves during the nineteenth century, starting in India and progressing across Europe and to North America. One particularly virulent epidemic came in the 1830s, coinciding with the building of New Orleans' New Basin Canal, and others would follow, continuing to puzzle the local medical establishment.

The horrendous epidemics did bring some civic soul-searching. Although businessmen were unwilling to admit the unhealthy condition of the city, residents were voting with their feet and leaving town each Summer. Those in the medical profession spoke out, were frank about the city's alarming rate of mortality, and called for efforts to dry and clean the town's environment, but had little in the way of scientific evidence for their beliefs. Dr. Edward Hall Barton, professor on the first faculty of the Medical College of Louisiana in 1834, was a native of Virginia, who trained in medicine at the University of Pennsylvania, and arrived in Louisiana in 1820. As a member of the American Medical Association in 1856, he published a Report on the Meteorology, Mortality and Sanitary Condition of New Orleans, charting his theory that temperature and humidity predicted epidemic disease, while noting that the wetness of the city and the lack of sanitary disposal means were detrimental to the public health. For all his careful observations of the heat and the humidity, Barton had no clue as to what might cause diseases.¹⁰

In 1862, New Orleans fell to federal forces, and the problems of the city became of concern to the U.S. Army. Occupying Union Army General Benjamin Butler had never seen a case of Yellow Fever himself, but he was well aware of the havoc it might cause by decimating his forces. So, he first issued orders that all incoming ships from designated locales were to be quarantined at the mouth of the river for 40 days before entering port. While the Civil War was raging, there was not an abundance of naval traffic, and Butler's orders were carried out. When two cases appeared in the city, from a ship that slipped past quarantine, Butler had the sick

isolated. He ordered fires lit and tar burned near their sick beds, and when the victims died, he immediately had all their possessions burned. His method worked – those were the only cases reported that summer, and there were few more before the end of the conflict. In spite of the relief from the annual Yellow Fever scourge, the city was not free from health problems. The expected health issues of any military encampment of the period -- venereal disease, diarrhea and digestive complaints -- ran rampant.¹¹

Butler had made his career as an attorney in the mill town of Lowell, Massachusetts. As a mill owner himself, he was well aware of the possibilities of mass production with an organized, if little trained, work force. Although he had not gained much combat experience, Butler had served as head of his state militia, and was familiar with delegating authority and assignment of work schedules. So, with a city filled with refugees, a populace with little in the way of possible employment, and a military force of 15,000, Butler had no difficulty in organizing work crews and setting hands to the task of cleaning up the city. Butler saw no problems in meeting salaries: he could press local Confederate sympathizers to foot part of the bill, the Federal Government could handle its share, and with a free hand over the city coffers (and the prior city council imprisoned), the occupying forces could come up with whatever other funds might be needed. Thus, with the factors of labor force and finance settled, Butler could attack.¹²

Butler ordered that a levee break uptown be repaired, the gutters were to be flushed with river water, the wharves would be refurbished, and the streets and drainage canals swept and scrubbed. He further ordered that all private property in the city be cleaned of trash and swept. Twice weekly garbage collections were scheduled. Houses without paint were to be whitewashed (a less expensive alternative.) Butler even imprisoned litterers.¹³ⁿ

Whether Butler's and his successors' clean-up efforts were long-lasting or not, the city did remain free of a Yellow Fever epidemic during the remainder of the Civil War years, although there were a number of cases of small pox, many residents and Army troops never having been vaccinated against the disease. Other problems remained. The Board of Health in the spring of 1864 was still calling for a better drainage system and an extension of the water system and a reduction in rates.

The New Orleans Water Works, a venture of the Commercial Bank, had been granted a franchise that did not expire until 1868, and its service during the War seems to have been as unsatisfactory as it was before. However, General Nathaniel Banks, who followed Butler in the city, appointed a five member commission to investigate banks and businesses in the New Orleans in 1864. While, predictably, the commission found faults with several private banks, it gave its approval to the New Orleans Water Works as a viable enterprise.¹⁴

Despite the wartime efforts of Butler and his hired hands, the city of New Orleans was apparently as wretched in 1868 as it had been on Butler's arrival, and his successors did little more, leaving the city in perhaps worse condition than when they had entered it.

Henry Clay Warmoth, onetime Union Army officer who relocated to the city from his native Illinois, recorded in his 1930 autobiography his observations of New Orleans in the year he was elected governor of Louisiana, 1868. The city was bankrupt, the only drainage was in open ditches, the people were still drinking from their own cisterns or using unfiltered river water from intake valves just downriver from where the slaughterhouses emptied their refuse in the river at Jefferson City above Canal Street. Warmoth saw the city as "dirty, impoverished and hopeless" in the aftermath of the Civil War.¹⁵

Warmoth was only twenty-six when he took office, and his radical political stance and championship of enfranchisement for the newly freed slaves made whites uneasy. His four years as governor and his political career afterwards, and his time as head of the U.S. Custom House in New Orleans were all fraught with difficulty and scandal. Apparently his quick wit, adeptness at public speaking, and unabashed enjoyment of a political squabble, and even his willingness to profit from political gains somehow allowed him to win a measure of toleration from Louisianians, and he remained a resident of the state until his death in 1930. Warmoth's enjoyment of politics and power, and his attention to needs of the poorer residents and blacks, even found him an admirer in Huey P. Long. The admiration was not mutual: Warmoth's diary notes about Long, whom he never met, show that he thought Long an unsympathetic buffoon.¹⁶

At the time of Warmoth's governorship, the State of Louisiana had taken a greater interest in the running of the city government than in prior years. This was mainly because of the turbulent state of reconstruction policy, which had the U.S. Army still in residence and most native white male voters still unable to vote. Control by the Federal Government out of Washington was threaded through the political web of elected state officials, and one result was the Metropolitan Police, a military force under state control but with police power in the city. This transfer of city powers to state government was extreme in Louisiana, but also in the mid-nineteenth century the State of New York had assumed control over the police in New York City. Frustration at the difficulties of asserting control over urban areas, with their increasingly large numbers of impoverished new residents (freed slaves in the South, new immigrants in the North) and uncontrollable political factions might result in State Legislatures impatiently taking over from what they saw as inadequate city governmental efforts.¹⁷

Warmoth also assumed power over New Orleans water questions himself. An enterprise called the Ship Island Canal Company proffered legislation that would appoint a single Commissioner of Drainage for New Orleans and Jefferson Parishes and award tax revenues to that commissioner and to the canal company, plus four hundred thousand acres of public land, in return for building a five mile protection levee along the planned canal. Warmoth vetoed the bill (for a rumored bribe), then, sipping champagne and handing out cigars, cheered the legislators as they over-rode his veto. This canal company quickly failed, the legislation was repealed, and a new company, in which Warmoth held \$100,000 worth of stock (which he bought on margin for \$20,000) was formed to build a canal between the Mississippi River and Lake Borgne. Then, in 1871, the Mississippi and Mexican Gulf Ship Canal Company was chartered as a private organization intended to undertake digging a canal from St. Bernard to the Gulf and taking over drainage for New Orleans. City drainage, meager though it was, was completely put into the hands of a private corporation who were better at collecting fees from residents than at providing drainage relief. The result was perhaps predictable: although thirty six miles of canals were dug, the existing canals and pumps fell into disrepair, the company was beset with lawsuits, and as a result, although various plans were presented, nothing else substantive was done for the next decades. Warmoth may have come to view canals ruefully: he badly injured his foot, requiring the amputation of a toe, while on board a boat inspecting some of the canal construction.¹⁸

Warmoth had effect on the water system of city, also. The New Orleans Water Works Commercial Bank franchise ended in 1868 and the system went into the possession of the city. A bill to transfer the works to a private company, Crescent City Water Works, was passed by the legislature. As Governor, Warmoth could either veto the bill or sign it into law, or send it to the Secretary of State without signing it, thus allowing it to become law without the governor's

signature. The bill had been passed by the Legislature, and taken by the clerk to the home where Warmoth boarded. The owner of the house, Mrs. John Deane, signed for the bill at eleven o'clock at night. Warmoth was not in, and did not receive the bill himself at that time. The Legislature ended its session five days later, at ten o'clock at night. Since, by law, the Governor must have had the bill in his hands for five full days before the close of the session for it to become law without his signature, Warmoth protested when George Bovee, the Secretary of State, promulgated the law at the behest of the company and took it to the newspaper of record, the New Orleans Republican, to be published. Warmoth dismissed Bovee from office, and insisted the dismissal was within his power. The skirmish made its way through the courts, and Bovee (who was a political enemy of Warmoth, which may have occasioned the whole affair) was returned to office. The firing of Bovee would be one of the articles of impeachment against Warmoth. The impeachment trail was discontinued just past the expiration of his term of office.¹⁹

Warmoth's reputed greed for political spoils, and his penchant for retaining incriminating correspondence in his files, are well illustrated by a letter, saved in his personal archives, sent him by a proponent of one of the canal drainage schemes. The possibilities that drainage plus politics equals profit are well illustrated in the missive. Warmoth's correspondent, Samuel D. Noyes, assured him that he would furnish "a few thousand dollars" so that the two of them could purchase "large tracts of the swamp lots" that would "become valuable in consequence of the complete drainage," and that "the lots fronting on the lake" would surely be "extremely valuable." Further, Noyes assured Warmoth, "nobody would thereby be injured" and they would "make an exceedingly good thing for ourselves." It could not be more plainly put.²⁰

After Reconstruction ended, the city's drainage system, according to Cable, was "of the most ineffective and simple character, adapted solely to the removal of surface water from the streets and house lots." Cable was as dismissive of the city's geography and drainage solutions as he was of its economy: the whole town was a marsh, except for "trifling elevations like Metairie ridge" and flood protection was a "a rude adoption of the Polder system of Holland."²¹

He described the three "draining machines" at work in 1880: one at "Dublin Avenue" (near the Orleans-Jefferson Parish line,) one at the beginning of Bayou St. John, and one at the London Avenue canal. These were steam engines, which pumped water from the canals, in which they were placed, toward Lake Pontchartrain. Cable also noted the noisome street gutters, which carried rainwater, refuse and household sewerage toward the canal system.

Before the 1871 chartering of the Mississippi and Mexican Gulf Ship Canal Company took over what they thought was the lucrative drainage problem of New Orleans, there had been earlier private and public efforts to drain the town.

The idea that landowners themselves be responsible for improvements was used to great advantage in other cities, most notably Chicago, where civic infrastructure improvements were dependent upon property owners for support. If Chicago property owners did not actively seek and support massive improvements, they got the minimum. In New Orleans, however, the drainage improvements had to be made throughout the area whether all landowners acquiesced or not. The 1839 Charter revision further required municipalities (New Orleans was separated into three at the time) to keep up any drainage canals or ditches put in by the company.²²

The Louisiana State Supreme Court upheld the right of the New Orleans Draining Company to charge landowners for improvements, and some reclaimed lands behind the city were settled. As for the settled parts of the city, in 1854, the Louisiana Legislature set forth three

drainage districts, from Julia Street up, from Julia down to St. Peter, and from St. Peter Street to St Bernard Parish. Some work was done to provide pumps and water for flushing the gutters, which still were the only sewerage system. Soon-to-be Confederate General P. G. T. Beauregard, West Point trained engineer, was in charge. A drainage machine was put at London Avenue -- looking much like a landlocked paddlewheel. The Toledano Canal was dug to meet the New Basin Canal, permitting the Claiborne Avenue Canal to drain directly to the lake. Most planned work, however, was never completed, and although steam engines were put in the drainage canals -- indeed, some from a plan instituted by New Orleans City Surveyor Louis H. Pilie in 1857 would be there decades later -- there was essentially little improvement until the Civil War brought everything to a halt, and little of substance was done later.²³

After the franchise of the New Orleans Draining Company expired, the Louisiana Legislature, on March 18, 1858, set up another drainage corporation charged with “leveeing, draining and reclaiming swamp lands” in both Orleans and Jefferson Parishes. As in the legislation setting up the first drainage company, landowners were required to pay the company the difference in value of their land when it had been drained. Predictably, the courts were involved. Finally, in 1875, the Louisiana State Supreme Court again supported the right of the company to collect from landowners, asserting that this charge was not a tax and could certainly be collected. And, as land nearer the lake was drained, settlement spread northward, cypresses were felled and the city grew. It would not be until the twentieth century that the current bounds of the city were reached.²⁴

In a method similar to that carried out by draining companies charged with draining and filling prospective residential land behind New Orleans, Chicago's city government in the mid nineteenth century operated its improvements financing on a "segmented" system. That is, costs

of public works improvements might be charged to interested landowners in the vicinity of the work, and those landowners might also make decisions as to how and whether those public works were carried out.²⁵

This privatization aspect of urban improvement funding could be applied to other public works besides drainage. Chicago, like New Orleans, had begun with a private waterworks company chartered by the state, the Chicago Hydraulic Company of 1836, which built a waterworks in 1842 and provided unsatisfactory service. In 1851 the Illinois legislature set up the Chicago Board of Water Commissioners which built and administered a public waterworks, and by 1856 the city was piped and water fees were charged, while the system was expanded gradually as property owners subscribed for piping to new areas, continuing the pay-for-service policies of the private company. After an 1854 cholera epidemic, Chicagoans clamored for a sewer system, and a Board of Sewage Commissioners was set up to oversee construction of a public system. Ellis Chesbrough, a respected engineer from Boston, Massachusetts, became the designer and chief engineer. It was Chesbrough who came up with the novel idea of laying his sewers at shallow depth and raising streets levels to cover them. Sewers were laid according to a grid plan, and expanded when landowners paid fees, but the sewer system of Chicago had to rely on bonds for funding and was bankrupt by 1861. By 1890, in addition to rates paid, general public funding rather than piecemeal assessments were supporting the sewerage and water systems of Chicago.²⁶

In spite of a plan suggested by engineer George Dunbar in 1840, none of the New Orleans draining companies had seriously considered the problem of sewage, until, on April 12, 1881, the New Orleans City Council adopted an ordinance setting up the New Orleans Drainage and Sewerage Company, a private enterprise which had been chartered by Act of the Louisiana

Legislature on March 17, 1880. The company was enthusiastically given a 99 year franchise and charged with setting up an underground system of sewerage disposal throughout the streets of the city, “substantially like that which has been put into operation during the last year in Memphis, Tennessee.” Storm water run-off and street drainage would still be through the gutter and canal system already in existence. The final destination for sewerage would be the Mississippi River. The company would assume the cost of building the system, but the city could buy it out after twenty years, and could build no other sewer system for twenty five years from the date of completion. For all its promise, and in spite of Cable’s outspoken support, and the fact that George Waring, Cable’s partner in writing the Census report, would have advocated just such a sewer system, the New Orleans Drainage and Sewerage Company never accomplished its goals. The most striking improvement by 1880 was the sewer line laid for itself by the St. Charles Hotel, with drainage into the Mississippi River. Only a few other private sewer lines would exist until the end of the century.²⁷

The water-works, as had happened in the 1820s, again veered into public control and then reverted back to a company. After thirty five years in private hands the city’s water-works came back into public possession in 1868. On March 10, 1868, The Daily Picayune noted that the Board of Alderman of the city were prepared to consider the purchase of the City Water Works at their meeting that day. As noted the following day, they approved a resolution to “purchase the Water Works under the conditions laid down in the Legislative Act of 1883,” which provided that the private franchise having ended, a committee of arbitration, both the city and company naming members, would set a price. The newspaper also noted that “it is proposed to create a bureau to manage it.”²⁸

Improbably, the resulting department of Water-Works under the Reconstruction era city government came under control of a former Confederate General, Braxton Bragg. Bragg had received his engineering training at the United States Military Academy at West Point, and was well qualified for his position, even if his former rank in the Confederate Army might make him less appealing to the contemporary political climate of Louisiana. Bragg had taken an oath of amnesty in 1866, and thus apparently made himself acceptable for employment. Besides coming up with a futile scheme to drain the city into the Mississippi River, an impossible task given the city's topography, Bragg made a concerted effort to put the city's water system on a firm footing. In an April 6, 1869, pamphlet entitled The Water Question, Bragg, acting as superintendent of the Water Works, presented his figures and asked the City Administration and the Common Council to support his plea that large water users, such as sugar refineries, have meters installed and pay for their water at a rate equal that that of small householders, whose unmetered use could be estimated. In his pamphlet, Bragg noted that 3,000 small ratepayers, together, used the same amount of water as one large refinery, yet the small householders "paid last year \$45,000 whereas the wealthy consumer paid \$1,000," Bragg asserted. He asked for parity in water fees, and also asked that the city relieve the water department of having to pay all the interest on the bonds with which the city acquired the Water Works, and also requested that the custom of the Water Works supplying free water for all public buildings and offices be stopped. "These are obligations not imposed on any other water works in the country," Bragg insisted.²⁹

Bragg's tenure at the Water-Works was brief. The system then came under control of the Department of Public Buildings and Water Works, with Louis T. Delassize as head. In keeping with the spirit of the Reconstruction era, city employment was now open to all, regardless of

race. By October of 1870, Edmond Rillieux had been named the Assistant Superintendent of the Water Works.

Edmond Rillieux is listed in the 1870 New Orleans city directory as living at 360 Rampart Street, in the Third Municipal District. He is shown in the 1870 census as a mulatto, living at that address with his wife, Catherine. Norbert Rillieux, the inventor, a free man of color before the Civil War, was a resident of France by this time, and had a brother named Edmond. The young engineer Edmond, born in Louisiana in 1841, could have been his brother but most likely was Norbert's nephew.³⁰

Rillieux's duties included fielding complaints from citizens and overseeing needed repairs to the system. On one occasion he was asked to take care of repaving an area near the Beef Market, apparently to remedy a water leak or a broken pipe. He was to supervise the unloading of coal at the Water Works for the steam pumps. He was to repair the hydrant at the Supreme Court Building. It was called to his attention that there were pipes lying in an open gutter on Market Street.³¹

J. E. Jewell, for the Administration, might send complaints to Rillieux, and he also took orders from Delassize. Rillieux relied on "spannermen", mechanics, to do the actual work, to repair pipes, stop "sprinkling of Canal Street", and in general keep the politicians and the public happy. Rillieux also was supposed to see that the only carts filling at the "fire plugs," with water for public vending, were licensed carts. In December of 1872 Rillieux was asked to turn over all documents to his successor, Sidney Brown, after a change in administrations from Mayor Benjamin Franklin Flanders, strongly supported by Governor Henry Clay Warmoth, to Louis A. Wiltz, when Warmoth lost power.³²

Cable, discussing the Water Works in 1880, noted that in 1878, the legislature had granted a charter and the New Orleans Water-works Company was incorporated, and “April 10, 1878, the entire property was deeded by the city to this company.”³³

The water system under the new company consisted in 1880 of 71 miles of cast iron pipe, from 36 inches to 3 inches in diameter, with 8 million gallons a day being pumped. The yearly income from water rates was \$91,000, with no water meters in use at the time. There was no filtration and “the deposit of sediment in the pipes” during high water months prevented the smaller mains from functioning. According to the 1880 annual report of the New Orleans Water-Works Company, the company had capital stock of \$2 million, and had issued bonds of \$182,500 when it purchased the works from the city. \$185,256.68 was spent on improvements to the works, the company claimed. “The most important need of these works is an arrangement for the supply of water clarified by settling in basins,” Cable noted. However, the company insisted it could not afford to do this at present, but hoped its improvements had increased water flow enough to clean river sediment from some of the pipes.³⁴

As Reconstruction ended and New Orleans took stock of its progress over the past decades, the city had little to celebrate. There was no sewerage system, drainage was minimal, the water system was inefficient and ineffective in delivering its promised commodity. Fragmented politics and a war-ravaged economy were detrimental to improvement, and those with power to make decisions were often motivated by greed and had few resources to back scientific advancements, even if they recognized their worth. One good result of scientific progress was that the Mississippi River’s mouth had been permanently opened for commerce by Eads’s jetties.

But, the Mississippi River itself was still a threat to the city. In this, the city had little control. Power over the river was gradually being assumed by the Federal government. After the floods of 1849 and 1850, the U.S. Congress enacted the Swamp and Overflow Land Act. By this 1850 law, some 27,8 million acres of land were given the states, 8,5 million to Louisiana. The donated lands were in flood plains, and it was hoped the states would be impelled to drain them and realize the profit of selling the newly desirable acreage. In 1854, the Louisiana Legislature divided the state into four districts, under the governance of a Board of Swamp Land commissioners, charged with building and maintaining flood protection systems, and, if possible, draining land for sale. By 1859 these levee districts, as they became, were under the state's Board of Public Works. The damming of Bayou Plaquemine in 1868 aggravated the state of the river by cutting off one of the remaining natural runoffs in the state's boundaries.

While the federal government, and the U.S. Army Corps of Engineers, would tighten control over the river and its flood control systems, the idea that levees alone were the solution would disastrously hold sway until into the twentieth century. Work to improve levees was hastened by a Congressional appropriation of \$200,000 in 1873, and the reliable fascines, willow mats, were put to use by the U.S. Army Corps of Engineers in levee construction, although they believed them to be a European-style revetment rather than something that had repeatedly been in use in Louisiana. Politics, the Army, and levees were permanently intertwined with the 1878 creation of the Mississippi River Commission, a joint military and civilian effort to oversee flood control. Handicapped by a shortsighted dependence on levees alone, the joint efforts to tame the river in the nineteenth century came to naught.³⁵

While the city might pay heed to Cable's 1881 invective about its failing infrastructure, New Orleans would have to wait patiently for solutions to its watery problems. The power to

make decisions had been in the hands of federal officials from the time of the city's occupation by the Union Army in 1862 until the end of Louisiana Reconstruction in 1877. As the city entered the last quarter of the century, the task of bringing New Orleans into the modern era continued, as technology improved and the power to implement it shifted to a new set of officials and gradually into the open hands of the people themselves.

End Notes

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Chapter 8. Bourbons and Water, 1880-1898

During the last two decades of the nineteenth century, after the end of Reconstruction, New Orleans found itself with many needs and few financial resources.

Yet, by the end of the period, the city had determined to modernize itself and its water infrastructure.

Politically, the city also went through changes in those years. Gradually, the white male electorate, like the restored “Bourbons” in other southern states, assumed power, culminating in adoption of a Louisiana State Constitution in 1898 that set Jim Crow laws in place and effectively disenfranchised African Americans. The tenor of politics statewide was conservative: on the local level it also reflected a conflict between economic classes: Irish and other immigrant groups and workers vied with the city’s economic elite for control. In this period, the city endeavored to shake off the effects of the Civil War and Reconstruction and modernize itself. The drive to modernization included infrastructure improvements. Some, like electrification and transit, largely affected the economic climate of the city by facilitating trade. The improvements concerning water – drainage, sewerage and potable water – were aimed not only at improving business, but also at making the city as safe and healthy a place for inhabitants as modern science and technology could produce. This, coupled with renewed efforts to combat disease, would also make New Orleans a more attractive spot for business.

The drive to make water improvements came not only from the business sector, but also from physicians, and from concerned citizens who demanded a better environment for their lives. Progressive reformers saw an improved environment as a means of social improvement for the citizenry, and they looked to professional engineers for both the planning and the execution of

projects. During the decades at the end of the century the forces of reform would create lasting changes in New Orleans: new and improved infrastructure, an emboldened citizenry, and a more effective, if not perfect, form of city government.¹

While those with the power to influence technology choices might vary from public officials, either elected or appointed; to moneyed merchants controlling the local economy; to journalistic gadflies goading for change; to various groups of citizens empowering themselves by working together; the choices made for change vary not only with the science or technology available at the time, but also with a patterned response to the spread of innovation and adoption of technology.

Some technological change adoptions can be seen as simply a function of economics: the swift spread in Louisiana of cotton gins after the Eli Whitney invention was because this would increase profits for cotton farmers. Norbert Rillieux's adaptation of a vacuum process for heating cane juice was immediately popular since it proved its worth in more profits through efficient sugar production. Urban infrastructure changes were adapted in a different manner. Private speculators like Benjamin Latrobe and the original investors in New Orleans's Commercial Bank saw a way to make profits from building waterworks since they would benefit from having a franchise to sell water. Drainage companies, as Henry Clay Warmouth was well aware, made land more valuable and thus enriched landowners. But other, major, infrastructure improvements were made for reasons besides the enrichment of a small segment of the public.

Urban technology spreads in a rational way. The model for cities making changes can be seen as an urban hierarchical system: big cities make a change, smaller cities follow their lead. Or, it might be deemed a contagion model: cities follow the patterns of nearby cities, or of cities that may be far in distance but are close in population or other characteristics. However, besides

monetary profit, making technology changes in public infrastructure involves social considerations. The public good is a factor in these technology decisions.²

Improved sanitation was generally seen as a public good. This began with the idea that foul smells, filth, and wet conditions were injurious to health. New Orleans physicians agreed on this from the earliest years of the city, and while little was accomplished to achieve their goals, there was a general consensus that a clean city with dry streets and fresh air would be a better city. Even if the local doctors had little idea of how disease was spread, and had scant comprehension of the role that polluted water and swamp-bred mosquitoes had in spreading illness, the local health establishment, the press, and even the business community and elected officials, were generally in favor of cleanliness and aridity. Public pronouncements and ordinances passed by the governing authorities from the beginnings of the city were all generally in favor of an improved environment.

By the 1880s, New Orleans's infrastructure needs had been well articulated, notably by writer George Washington Cable in a sketch of the city produced as part of the 1880 census. Technology to solve the city's problems was available: cities throughout the world had installed sewerage and water and drainage systems. What would be the prod that drove New Orleans to install modern urban infrastructure?

The impetus for change in New Orleans infrastructure in the last quarter of the nineteenth century came from two factors: first, the appalling death rate of the city, proof positive that living or doing business there was unhealthy; and secondly, the national movement of Progressivism, a country-wide striving for rational civic governance characterized by professionalism, research, and active involvement from citizens and interest groups. The death rate, the annual epidemics, the disastrous effects of quarantine on the local economy, drove the

business class of the city to action. The Progressive movement gave structure to the actions that followed.³

Progressivism was a middle-class reform movement that rose in late nineteenth-century America as a reaction to the excesses of modern civilization. It was “an attempt to develop the moral will, the intellectual insight and the political and administrative agencies to remedy the accumulated evils and negligences of a period of industrial growth.”⁴

Progressives applied scientific principles to investigating and solving problems. Progressives also believed that professions should have regulations for performance, and believed that a well-trained government bureaucracy was needed to solve societal problems.

Progressives were more often urban community leaders who stood for “enforcement of middle-class standards of civic decency against greedy wealth and crooked politics.” Progressives held that "government cannot be viewed merely as a cold and negative policing agency" but that it has "a wide and pervasive responsibility for the welfare of its citizens, and for the poor and powerless among them." The ideal Progressive was active, optimistic, unwilling "to sit by passively" and embracing a "faith that no problem is too difficult to be overcome by the proper mobilization of the energy and intelligence in the citizenry." ⁵

As did the rest of the urban South, New Orleans over time experienced Progressive reforms. Southern Progressives were concerned with order and morality, along with efficiency and humanitarianism. This led to a broader view of the responsibilities of government, and advocacy for a wider definition of needed public services. In specific Progressive reforms, the New Orleans city government changed to a Commission Council in 1912, but the local machine still functioned under Democratic Mayor Martin Behrman. A maverick, Behrman later took the

extraordinary step of backing fellow New Orleanian and usual adversary John M. Parker for a post in President Woodrow Wilson's cabinet.

Parker had been a longtime Progressive, as were other Louisianians with agricultural interests because they agreed with Progressive ideas on trade controls. Parker was a close friend of President Theodore Roosevelt and served as his host on his many Louisiana visits. A wealthy cotton broker, Parker had originally been a Republican, as had Roosevelt. After being active in the Progressive Party's 1912 national campaign, Parker broke with Roosevelt in 1916 and became candidate for vice president on that year's Progressive ticket (found on only a few state ballots). In effect, the Progressive Party ceased to exist as a political entity in 1916, although its philosophies would continue to have adherents. The strong presence of this one-time Progressive and his philosophy regarding the New Orleans political scene meant that the climate of opinion in the city in the late nineteenth and early twentieth century was at once patriotic, benevolent, professional, and supportive of an involved community leadership. New Orleans' civic benevolence did not include racial integration. Parker's Progressives were lily-white – in spite of their anti-machine and pro-professionalism views, they represented one off-shoot of the Bourbon movement in the post-Reconstruction South.

In New Orleans, the roots of the local Progressivism stretched even further than that. The massive infrastructure project that would be presided over by the New Orleans Sewerage and Water Board was not only a turn-of-the-twentieth-century marvel of engineering, it was the final product of an unlikely coalition of personalities, events, and an overarching movement toward progress that caught an entire city up in a maelstrom of action in which the citizens themselves ultimately assumed the role of agents in effecting lasting change for their community.

Making New Orleans a better city had only gradually become a goal that its citizens could envision accomplishing. After a flurry of business investment at the Louisiana Purchase, New Orleans began to resemble other American metropolitan areas in taking steps toward civic improvement. A nascent “boosterism” with private entrepreneurs and some elected officials coming together toward common goals for bettering infrastructure emerged in the mid-nineteenth century. By the 1850s, New Orleans had a stable economy and hopeful citizens could envision a united city (after a brief try at splitting into a trio of competing local governments) with a brighter future. Then came the Civil War, the occupation of the city by Federal troops in 1862, and a federal takeover of the city and state during the Reconstruction era, lasting until 1877. Thus, for almost two decades of the nineteenth century, the natives of the city, both black and white, had little real control over their urban destiny. The hopefulness for civic improvements that had been felt in the 1850s only gradually came back on the public agenda in the 1880s, with the added impetus of the emergent Progressive movement.

In the 1880s, New Orleans was just seeing the first stirrings of this new Progressive urge to reform. The 1878 yellow fever epidemic, and the quarantine that isolated the city and the economic impact that resulted, served as a wake-up call to Orleanians. Where before the annual scourges of the hot months had been annoying, the threat that disease could ruin the city’s hopes for a bright economic future spurred the citizenry to consider positive action to solve the city’s problems. New Orleans felt itself on the verge of greatness: the jetties installed in 1879 by James B. Eads had assured that Mississippi River traffic could go freely into the Gulf of Mexico. But, all was not perfect. As George Washington Cable eloquently explained in his essay in the 1880 census, New Orleans had little in the way of public infrastructure, especially considering that this was a major metropolitan area. In 1880, New Orleans had 216,000 residents on the East

bank of the Mississippi, residing mainly in a strip of land along the river, with sparse settlement in the marshes and swamps that were included in the city's boundaries stretching north to Lake Pontchartrain and east downriver. An additional 8,000 lived on the West Bank in Algiers, an area historically tied to New Orleans but annexed only in 1874, and having its own built infrastructure separate from East Bank systems.⁶

New Orleans in the 1880s had a miniscule and ineffective drainage system, no sewer system, and a barely functioning East bank waterworks. Yet, the city was one of the largest in the country, and had been in the top tier -- in terms of population -- of American cities since it had become part of the United States, although it was gradually falling in ranking.⁷

The medical profession, health officials, the press, the businessmen and the politicians were all well aware that Yellow Fever and Cholera were scourges to be avoided -- indeed, those who could afford to leave regularly deserted the city each Summer when epidemics were most likely to occur. Potential victims could cheat the disease by avoiding contagion -- but the true solution to New Orleans' woes would obviously be to keep the diseases from recurring in the city itself. The solution was seen as keeping the city clean, without noisome odors, dirt and filth. Emphasis was on improvements that could be perceived by physically sensing a difference -- no more smell, no more wet and over flowing gutters and privies, no more visually intolerable piles of garbage and rubble. There was limited realization that problems lay in things invisible to the naked eye -- the unseen germ, the bacillus, the virus, the microbe -- or that the pesky mosquito was not only an annoyance but the bearer of death. Although by 1880 there was existing scientific knowledge that bacteria, while unseen by naked eyes, could carry death, the medical profession in New Orleans did not rely on scientific data alone in urging environmental improvement. What began as an urge to cleanse would morph into a drive to remake the notion

of what constituted a suitable urban environment and to build an infrastructure that would assure residents that a healthy, modern city was an attainable goal.

One sure measurement of the health of a city can be taken by counting how many of its residents died each year. Counting the number of annual deaths, and comparing that data to the annual population total results in a statistic: deaths per thousand of population. These numbers could be compared for different cities or areas, and taken together are referred to as mortality tables. Beginning in 1850, death statistics were collected as part of the United States Census, but only in 1880 was census data for distinct cities compiled for use in making comparisons across the country. Mortality data for cities before 1880 were taken both from spotty federal recording of data in the census, and from cities' own death registers or those compiled by physicians.⁸

Variations in a city's mortality data from year to year could be large in the nineteenth century. Epidemic disease could sweep through and the death rate would rise, as it did in New Orleans for yellow fever epidemics in 1853 (when a remarkable 99.2 people per thousand in the city died) and 1878 (48.8 per thousand.) Where statistics for cities can be compared, in the period beginning with 1871, New Orleans is shown to be strikingly unhealthy. And, there was a correlation between deaths and improvements: after the 1853 yellow fever epidemic the New Orleans water company instituted a program of flushing streets clean by opening fire plugs, and cities often instituted clean water systems after the death rate soared. A rise in death rates could predictably force a city to improve its water system.⁹

Both the political structure and the financial security of New Orleans complicated the struggle to create a healthy environment. After the Civil War and Reconstruction, New Orleans reeled under the burden of political power struggles. As Southern white males regained political power, first by being enfranchised themselves, then later by changing laws limiting participation

by the recently enfranchised African-Americans, they proceeded slowly but inexorably toward a form of representative government that gradually excluded participation by African-Americans and, indeed, used Jim Crow laws to make black citizens' lives miserable and eventually enacted the restrictive Louisiana State Constitution of 1898. In the 1880s, in New Orleans, these steps were beginning, and, following other American cities, the new white immigrants, the Irish and the Germans, began flexing their political muscles and taking over city government. The result was "the Ring," as it became known, a system of Democratic ward bosses that took over City Hall, regularly excoriated in the press by "the reformers." "The Ring," like groups in other American cities, rewarded its workers with political jobs. Oddly enough, in New Orleans, this had the immediate effect of improving the city.¹⁰

Just as Union Army General Benjamin Butler had used soldiers and newly freed slaves as labor (paid from city coffers and reluctantly generous Confederate funds) to clean the streets and wharves, thus staving off epidemics in the early 1860s, so John Fitzpatrick, Ring politician, managed to put a large workforce out on the streets to clean gutters and generally improve New Orleans's wholesomeness. Fitzpatrick, who would later serve as Mayor, was boss of the Third Ward, and stepped in to head the Department of Public Works in December of 1880. Reformers castigated him for hiring numbers of workers for his department, but Fitzpatrick was able to clean streets, add surfacing, and contend with streetcar franchise holders for further street improvements. Had there been ample city money to keep workers on the payroll, Fitzpatrick and his successors might have continued to improve the city's services, but finances would not allow it. Manual labor, and lots of it, had ameliorated New Orleans's infrastructure needs throughout the city's existence – even Governor Carondelet in the Spanish period was only able to complete

his canal to Bayou St. John when privately owned slaves were sent to work on it. In an era when labor had to be paid to perform, the city's needs went unfilled.

In other American cities, ring politicians would reward their friends with lucrative contracts, usually involving vast infrastructure projects. New Orleans could not provide this speedy way to enrichment by graft: the city could not pay for it. The finances of the city were in a ruinous state because of its massive debt burden, some of which resulted from the ill-fated split into three municipal governments which ended in the 1850s. The years of Reconstruction, however well intentioned the federally appointed rulers of the city might have been in terms of equality for all citizens, left all citizens of the city equally burdened with a debt load of \$97 per capita (second only to Washington, D.C.'s \$127 per person.) Thus, there was no way for New Orleans to finance massive public projects, so beloved by corrupt political machines. Moreover, most of the citizens were poor: the average New Orleans home was worth \$2,053, the lowest valuation for any American city over 100,000 in population. Aggravating the situation was an 1882 federal court decision that raised the New Orleans property tax rate from 1.78 per cent to 3.178 percent -- an increase forced on taxpayers to meet the city's creditors' demands.¹¹

New Orleans, post-Civil War, was in a financial quandary. Taxes on the ballot went down to defeat. Reformers charged the Ring with corruption, and espoused the view that voters did not trust Ring politicians to complete improvements and thus voted down taxes. The city's problems only worsened.

The last great river flood had covered most of the city with water for six weeks in 1849, but there were regular floods from Lake Pontchartrain. The lake's elevation was higher than that of much of the city, and the lakeshore was rimmed with swamps and marshland. Since land along the river was higher, the natural drainage ran toward the lake, with the Metairie and

Gentilly ridges blocking direct flow. By 1880 the city had a system of canals and drainage ditches in place to drain water to the lake, with steam-powered paddle wheels affixed as drainage machines: one in the Carrollton area on Dublin Street (near to the Seventeenth Street Canal location of today); one on Claiborne at Melpomene, one on Toulouse Street, and one on London Avenue (near the London Avenue canal of today.) A machine was added on Orleans Avenue at Bayou St. John in 1887. They were ineffectual at best, cut through the Metairie and Gentilly ridges, thus lessening that small flood protection, and when tides rose in the lake, the water flowed into the city, with especially disastrous floods in 1878 and 1881. Since there was no sewer system, the regular flooding also brought the noisome contents of cesspools into the gutters and street, further aggravating the populace. River levees were adequate enough to keep river water out, but were in constant need of repairs.¹²

The regular flooding and the surrounding swamps had the expected effect: mosquitoes bred prolifically, and the disease they spread so easily flared up in the city again and again. The Yellow Fever epidemics produced scenes of such civic horror and suffering on such magnitude that a call to action was raised by physicians. In 1885, Joseph Holt, M.D., President of the Board of Health of the State of Louisiana, spoke before the American Public Health Association in support of formation of a Yellow Fever Commission. Holt acknowledged that germs caused disease, in fact, this was “no ingenious figure of the imagination, but a doctrine hammered into shape by sheer force of logic.” The use of quarantine regulations, the isolation of cases of disease and the fumigation and disinfection of locations of disease, were in place because germ theory had been accepted, he noted. So far, these methods had not stopped the spread of Yellow Fever nor had anything been found that would guarantee immunity from it. Thus, Holt spoke in support of a federally sponsored commission to study the disease worldwide.¹³

Holt also spoke frankly of the health problems of New Orleans and what was needed to solve them. “New Orleans, of all cities in the United States, requires a most thorough system of drainage and sewerage, as the foundation of health and comfort, upon which her prosperity depends.” Holt noted that New Orleans was recognizing its need, and he praised “the philanthropic zeal of sanitarians” and the “mighty power of an intelligent press” for bringing this to the public’s attention. “The popular sentiment is becoming responsive to the guidance of science, and appreciative of the value of preventive medicine,” Holt declared ¹⁴

Holt said that plans were already underway for “establishment of systematic sanitation” with discussion of “ways and means for the efficient drainage and sewerage of the city” being considered. Plans included creation of a Board of Public Works, “untrammelled by political entanglements” and composed of citizens with integrity, advised by competent engineers. Holt added that this board would “soon formulate a general plan” to solve current problems and bring about permanent improvements, all “without creating a debt or requiring the levy of a burdensome tax.” A capitalist as well as a physician, Holt, himself, would found a private company in 1892 with the aim of solving the city’s sewer problems: by 1895 it had failed.¹⁵

New Orleans, in spite of its troubles, was intent on improving its image and its economy. The World’s Industrial and Cotton Centennial Exposition was held in 1884, opening while street and transit access was still limited, but proving a popular destination both for citizens and a respectable number of visitors. Today’s Audubon Park was the site of the events, and the fact that this urban park space was improved was a bonus the fair, although otherwise beset with financial difficulties, delivered. A park was a needed amenity: other infrastructure needs were great. The city continued to look to private franchise holders for water and sewer systems.

After the 1830s era franchise for the waterworks expired, the city operated the water system itself, from 1868 until 1877, when it was sold to another private company, the New Orleans Water Works Company. The new owners were granted a 50 year charter and, in return for furnishing water for city buildings and those owned by charities, would be assessed no taxes. The city could allow other groups to obtain river water for their own exclusive use. The new water company was to lay additional water lines and build a new plant. By 1879, company officials had to contend with excessive sediment in the water: the collecting basins in the brick reservoir on Religious Street were also filled with sediment.¹⁶

By 1884 the water works company had spent \$397,000 repairing the system. The reservoir was rebuilt, a new pump went online, old pumps were refurbished, and by 1886 over 70 miles of new pipe had been laid. The company even managed to increase water pressure to 150 feet, high enough for hydraulic elevators in downtown buildings. Nevertheless, those improvements came at high costs: a thousand gallons of water was 86 cents in 1886: cost for that quantity had been less than 48 cents in 1884. Water service was available to more areas in the city than before, although areas farther back from the river, those with the poorest residents, were less likely to be served. As the era of Jim Crow loomed, African American residents, who were most likely to be poor, would find that the water services available to them became progressively worse than those available in white areas.¹⁷

The New Orleans Water Works Company never forgot that it was operating a business, not a humanitarian concern. The water it supplied was never clarified and could not be deemed wholesome as drinking water. The company was unwilling to open fire hydrants in time of drought, even when cisterns ran dry and the populace desperately needed the buckets of water they could get at open hydrants. Lowering the water pressure by opening hydrants would

adversely affect elevator operation for its business ratepayers, the company complained. The water was even turned off at night, and only in 1889 was round the clock water available. However poorly it operated the water system, the New Orleans Water Works Company was diligent in one thing: protecting its monopoly. A competing water company sought to bring fresh water from North of Lake Pontchartrain to the city in 1882, but the New Orleans Water Works Company successfully blocked its plans (only to adopt and then discard the same scheme.) By 1887, the United State Supreme Court had found in favor of the New Orleans Water Works Company, thus assuring the firm that their monopoly on supplying the city with water was secure.

The poor record of the company continued, and ultimately an investigation by the Louisiana Legislature in 1895 found the water company badly deficient in providing dependable service and an affordable product, and the courts finally approved the city's takeover of the franchise. By the twentieth century, one of the fiercest struggles the new New Orleans Sewerage and Water Board system had was over the lengthy and costly negotiations that finally spelled the demise of the New Orleans Water Works Company monopoly.¹⁸

While some useful water service came in to the city, there was no system at all for the disposal of sewerage, save for some private sewer lines at the D. H. Holmes department store and a few hotels and office buildings. The overflowing cess pit, the "honey wagon" that carted away night soil, the ubiquitous noxious gutters along the streets: all these factors in everyday New Orleans life made aromatic sweet olive, jasmine, and citrus plants mainstays and necessities in local residential gardens by the late nineteenth century.¹⁹

The impulse to improve one's surroundings, a tenet of Progressivism, resulted in the formation in 1879 of the private New Orleans Auxiliary Sanitary Association. Subscribers were

found among the business community and uptown residents, and a program of improvements in sewerage disposal and drainage, as well as public education programs on the need for such services was launched. The group acted as an auxiliary and funding apparatus for the Department of Public Works, in fact, the private group took over maintenance of the Toulouse Street canal and improved it, and began a system of gutter flushing and street cleaning that was better than anything city government had provided previously. Gutters that ran perpendicular to the river could be flushed. But, just as when the water system in the 1820s had been used to flush French Quarter streets in this manner, the complaint arose that water flooded areas at the ends of the inhabited streets where the gutters came to a halt. But, even if streets parallel to the river could not be cleansed in this manner, the gutter flushing program was successful in relieving some of the odiferous streets problems.²⁰

Although sentiment for improved infrastructure might be growing, improvements did not appear. A political upheaval in City Hall in 1888, with the Young Men's Democratic Association taking over from the Ring, brought no noticeable change, even if the Y. M. D. A. platform called for levee and drainage improvements, "to save the city from the overflows which made lakes of lands in the rear of the city." Problems proved so insoluble that former Confederate General P.G.T. Beauregard, a well-trained West Point engineer, lasted only two months in his elected post as Administrator of Improvements before quitting in frustration at the impossibility of improving anything without funds, just as another former Confederate General, Braxton Bragg, had deserted the city's water department in the 1860s. Another private enterprise, the New Orleans Paving and Drainage Association, managed to put a proposal on an 1889 ballot for a three mil tax for improvements to both streets and the city's drainage. Predictably, the measure went down to defeat.²¹

By the end of the 1880s Orleanians were frustrated. Other cities were constructing sanitary sewers on the plans of Col. George E. Waring, Jr. Memphis, reacting to the same 1878 Yellow Fever epidemic that hit New Orleans, supported findings of a committee set up by the National Board of Health and, by 1881, had a sewer system designed by Waring in place and functioning. Other cities had drainage systems that worked, and potable water supplied throughout the metropolis. In fact, two-thirds of all major United States cities had sewer systems by 1880. But New Orleans had none of these things.²²

New Orleans's difficulty was compounded by the city's topography. High land was at its edges and any drainage would, of necessity, require that water be pumped up and out. Piecemeal schemes had failed. Set up by Act 165 of the Louisiana State Legislature, three drainage districts of the city existed from 1858 to 1871, none of which accomplished much. Presumably owners of swampy land would willingly pay fees when their newly dry property increased in value: when the city itself turned this scheme over to the Mississippi and Mexican Canal Company in 1871, that enterprise promptly failed and its equipment was bought out by the city from its creditor the following year. Various schemes were tried by private interests, but all came to naught. The problem of how to drain the city remained unsolved. Foremost in civic boosters' minds was the idea that the morass at the edges of New Orleans, the "back of town" area between the river and the lake, and the lakeshore swamps themselves, could all be drained and become valuable residential real estate. Efforts at the Louisiana Legislature to get a drainage tax on the Orleans ballot failed in 1888.

Finally, after flood water from Lake Pontchartrain again inundated the rear of the city in 1890, the Louisiana Legislature acted to create the Orleans Levee Board, with the hope that organized flood protection would also assure that land would remain drained and dry year round.

The first step toward that goal was a study, funded in February of 1893 by the Louisiana State Board of Liquidation, the state agency set up to manage government debt. Then in November of 1893, the Advisory Board on Drainage was set up by city ordinance, and charged with coming up with a plan. Ultimately that original plan called for drainage machines (pumps) at seven stations: three along Broad Street, two on the Florida Avenue Canal, and one each for Orleans Avenue and for the Seventeenth Street Canal. All those locations are still at or near where current pumping stations and canals are located.²³

Mayor John Fitzpatrick, whose tenure as head of the city's Department of Public Works had been one of the few bright spots of the prior decades, appointed three well-respected engineers, Rudolph Herring, respected hydraulic and sanitary engineer from New York; B. M. Harrod, Chief Engineer of the State of Louisiana; and Maj. Henry B. Richardson, former chief engineer of the city to the drainage advisory board, and named local businessmen Albert Baldwin, R. M. Walmsley and J.C. Denis to a lay advisory board. The city's ordinance called for \$700,000 from the sale of the New Orleans City and Lake Railroad franchise to finance the study.

On January 23, 1896, drainage specifications were turned in to the city council, and were modified by the engineers. At this point, Mayor Fitzpatrick stepped in and vetoed an ordinance that would have put the drainage construction plans out for bids. His reasoning was that there was no money to pay for it. Some funding mechanism was necessary before this massive construction work could take place.²⁴

It was left to the next city administration to undertake drainage improvements. When a topographical survey had been completed, it fell to the city engineer L. W. Brown to come up with a plan. Brown advocated two separate systems, one for rainwater and groundwater removal and one for sewerage removal, exactly as the New York engineer Herring recommended in his

work on sewer planning. Factors that went into the plans included the fact that, because New Orleans sat in a land bowl, all drainage had to be pumped up and out; and, the city needed to keep its navigation canals open and its existing drainage canals free from silt. The plan included 95 miles of canals which drained, for the most part, into Lake Borgne, with Lake Pontchartrain only used for high rainfall output. With the beginning plans in place, the Drainage Commission issued specifications for bids on construction. Contractor for the first pumping stations built was the National Contracting Company of New York, who, after some skirmishes in court over the quality of cement used, managed to produce lined and covered canals, an electric power station, and three pumping stations. The Drainage Commission's chief engineer B. M. Harrod, was responsible for pumping station design.²⁵

In 1899, the Louisiana State Legislature created the New Orleans Sewerage and Water Board and authorized the city to hold a tax election to fund a bond issue for infrastructure construction. The force behind this proposed public utility was New Orleans Councilman Abraham Brittin, member and later president of the New Orleans Cotton Exchange and a strong Progressive and activist in the Municipal Improvement Association, formed in 1897 to foster modernization projects for New Orleans. Brittin served his city without drawing a salary as councilman. He had been working for over a decade on sewer improvements: the 1888 bills that failed on the subject in the Legislature had been instigated by him. By November of 1898, Brittin was on the City Council and, at a meeting in the office of Mayor Walter Flower, outlined his plans. Rather than rely on private ownership, Brittin advocated that the sewerage and drainage systems should be publicly owned, that the city be allowed to pay for construction with a tax to be voted on by the voters, and that the private water company should be purchased with those same tax moneys and come into the system.²⁶

Brittin was the prototypical Progressive, a businessman of financial acumen who willingly gave time and thought to public service. He had been born in Arkansas but came to New Orleans as a child, graduated from the public boy's high school, and after an apprenticeship with a cotton broker joined the Confederate Army. After the Civil War he prospered as a cotton broker himself. He served twenty years on the Board of the Equitable Life Association insurance company of New York; was a director of the Hibernia Bank, Tulane University, and in political life served eight years on the City Council and two terms on the State Board of Education.²⁷

Brittin's vision of a vast publicly run system by which New Orleans dealt with its water problems would become, on its completion in the first decades of the twentieth century, a \$30 million engineering marvel. The election on the tax issue was successful, with an energetic coalition of Progressives, the city business establishment, and women working for its successful passage. By 1902, the Drainage Commission was merged into the Sewerage and Water Board and the utility was complete. Even today, a lasting tribute to that new drainage plan for the city might be found on New Orleans water meter covers. The New Orleans Sewerage and Water Board logo, with its crescent moon and seven stars, can also be symbolic of the crescent curve of the Mississippi River, with the seven stars standing for the seven major pumping stations on the master plan.

After the New Orleans Sewer and Water Board came into being, the fledgling municipal utility was both innovative and competent. Governed by a board that included both elected officials and constituents representing different areas of the city, the utility was most fortunate in the engineers it employed. In fact, as the sewer system was constructed, the board itself took on the work of building the system, thus saving the city money. George Earl served as General Superintendent of the Engineering Department, and successfully proved that Mississippi river

water could be inexpensively made safe to drink. The purification plant Earl designed on Claiborne Avenue is still functioning today. Earl was a native of New Jersey and a graduate of Lafayette College in Eaton, Pennsylvania, with a degree in Civil Engineering. He first came to New Orleans to work for Dr. Holt's New Orleans Sewerage Company, and after that firm went into receivership in 1895, he kept his position, and in 1900 he went to work for the New Orleans Sewerage and Water Board. Another notable engineer on the Sewerage and Water Board staff was Alfred Theard, New Orleans native and graduate of Spring Hill College in Alabama. He had been an engineer with the New Orleans Drainage Commission, and he went to the Sewerage and Water Board when the two were consolidated in 1902. Theard, a civil engineer and architect, became superintendent of the Sewerage and Water board in 1931 and died in 1939.²⁸

The most remarkable engineer at the Sewerage and Water Board was A. Baldwin Wood, who graduated from Tulane University and was first employed as an assistant to Alfred Raymond at the old Drainage Commission. By 1908, Wood was at the Sewerage and Water Board in charge of both drainage and sewerage pumping stations, and his innovations there resulted in the invention of the Wood Screw Pump, a remarkably efficient pump, easily maintained and repaired. (It is even possible to climb down into the interior of one of these pumps while it is in operation – the author has done so.) The pumps were ideally suited to New Orleans' needs, as they could get water up and out quickly, and some of them are still functioning today. Even after they were shut down in Hurricane Katrina, both accidentally by power loss and on purpose to stop recirculation of flood water pouring in through canal wall breaks, the Wood pumps were dried out and brought back on line and helped get the flood waters out of the stricken city. It was Wood, also, who devised a way to connect lines from the old private water works company into the new city system.²⁹

In summing up the city's infrastructure accomplishments, Mayor Martin Berhman in 1914 addressed a meeting of the League of American Municipalities. The irony of a machine mayor speaking before a blatantly Progressive group was something that New Orleans could also count as an accomplishment: all elements of city government were firmly behind the great work that solve the city's water problems of the period. As Berhman summed up:

These three great public utilities stand enduring monuments to the courage, determination and infinite resourcefulness of a people who cheerfully and with much self-denial made them possible of accomplishment, and no less are they tributes to the ability, zeal and splendid engineering skill of those who devised and brought them to a successful consummation, in spite of most disheartening conditions.³⁰

Thus, finally, at the confluence of power and science, a wellspring of hope for civic betterment emerged in New Orleans. Remarkably, the power to effect this change had shifted over the centuries from European rulers, to elected officials and merchants, with gadfly journalists prodding public opinion, all the way to the voting citizen, and even to women.

End Notes

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Chapter 9. The Upstream Battle: 1890-1899

Clean water, efficient drainage, and a sanitary sewer system were major needs of the city of New Orleans in the last years of the nineteenth century. The women of New Orleans would play a vital role in the quest to meet those needs.

New Orleans was located in the South, but the image of the traditional languid Southern belle did not fit a large portion of its female citizenry. Even in the century before they were enfranchised, women in New Orleans were interested supporters, active proponents and, in some cases, the providers of infrastructure services that were necessary for urban government to function.

Besides the women who founded and served on boards of charitable organizations concerned with the needs of women, children and the sick, there were women who directly provided for civic needs. Since 1834, the Sisters of Charity had been in charge of operating the city's Charity Hospital. Beginning in 1860, Sisters of the Good Shepherd served as a justice system resource for incarcerating non-criminal delinquent girls and women status offenders. A female staff was in charge at Kingsley House, a settlement house that began serving the poor above Canal Street in 1896. Without the energetic Sophie Wright there would have been no night-school education for working men.¹

Many women's literary and special interest organizations were active in the city in the last quarter of the nineteenth century. The idea that women should be both educated and active for the public good was widely accepted. Even if they could not vote, women were part of the city's public life. Public school teachers, journalists, business owners, retail clerks and domestics – women were in the workforce of the city, serving ably in the jobs available for them or in businesses they controlled.

Active and involved in civic life, these nineteenth century New Orleans women happily embraced Progressivism, a movement characterized by insistence on professionalism, reliance on research and statistics, and an emphasis on enlightened citizen participation in government rather than acquiescence to political machines.²

New Orleans women acted on Progressive tenets, with inspiration also from the growing women's suffrage movement, and, in 1898, formed a Local Council of Women, enrolling more than one hundred local women's organizations. This council, an offshoot of the National Council of Women, was an important force in building support for infrastructure improvement.³

What the women of New Orleans united to do was simple: organize themselves for action, identify problems, investigate and learn the facts, bring their findings before the public, and then take steps to effect a remedy. They did these things by forming the Local Council as a coalition of women's groups, then forming committees on aspects of city life (one of which was the Sanitation Committee), investigating the current situation and documenting irregularities, holding a public meeting on the topic, and working to secure limited voting rights for women when the tax millage to support issuance of bonds to solve the problems appeared on the ballot. The women succeeded mightily.

The New Orleans Sewerage and Water Board, would preside over the vast system, completed by 1910, that these women helped create. The entire system was one of the largest infrastructure projects in the United States up to that time. It could not have been done without the help of New Orleans' women.

A chance convergence of three necessary factors in the eventual creation of the water system – remarkable New Orleans womanhood, growing female empowerment, and the obvious water needs of the city – was recorded in the local press in Mardi Gras week of 1881.

The city's celebration of the pre-Lenten festival was marked with parading "krewes", organizations of masked men. Foremost was Rex, and that krewe paraded on Mardi Gras Day. Following Rex's Tuesday parade in 1881 was the parade of the "Independent Order of the Moon." This krewe's display was satirical, contemptuous of city government. Krewe members masked and rode mules, "the tenth mule is labeled 'the Water Works Department' which spends its time in getting fat." The last mule "personifies the city," and was attached by ropes to figures labeled "city debt, bondholders, administration: all are pulling in opposite directions." Pulled along behind, "lassoed on the end of a rope" was the "poor taxpayer who foots the bill."⁴

Along with that parade description, the newspaper the same week ran social notes, one of which mentioned a new fad, "the rage for 'reading papers'," which began in Boston, where "girls are always about to read a paper themselves at one of their pet societies" or going to hear somebody else read one, while even little girls organized their dolls into clubs so papers could be read. The Picayune, under direction of Eliza Nicholson and with a female staff contingent, had a strong feminist voice in its columns, and it was not surprising to read supportive words about women educating themselves.⁵

First note in that same social section concerned Rex's consort: "the beautiful Queen of the Carnival won the affection of all her subjects by the grace and simplicity with which she sustained her royal station."

Queen of Carnival that year was Cora Slocomb. As a married woman, the Countess di Brazza, Cora Slocomb would return to New Orleans in the late 1890s to instigate the founding of the Local Council of Women. New Orleans women by that time had been busily researching and speaking out, giving "papers" of their own before the new women's groups. And, the problem of

the poorly run water works would continue to be an object of municipal scorn until, with the women's help, action was taken.

Despite the plenteous supply of fresh water flowing down the Mississippi River, New Orleans and its citizens required a dependable, pumped water supply for firefighting, street-cleaning, and domestic use. A private corporate built the city's first water system, designed with a simple steam pump pulling river water into a system of buried cypress logs along French Quarter streets, with hand-pumps at street-corners. When the corporation went bankrupt before the pump was put to use, the city acquired the water system in 1821, put it into operation and kept it into the 1830s. The Commercial Bank was chartered in 1833, with the sole purpose of constructing a waterworks, and by 1836 had one operating with more piped streets, and a large reservoir in the Irish Channel on Religious Street. That water system was granted a franchise lasting until 1869. When the franchise expired, the city again assumed control of the water works, by now in poor condition, and operated it for nearly ten years.⁶

In 1877 a new corporation took over, the New Orleans Waterworks Company, and in return for a 50 year franchise, agreed to supply city water and upgrade the system. The reservoir was enlarged, pumping capacity was increased, and more pipes were laid. There was great dissatisfaction with this water company: it seemed greedy for profit (rates were high,) valued business customers over the public (it turned the system off at night when businesses were closed,) and did nothing for the poor (refusing to turn on fire hydrants – a viable source of household water -- during drought when the poor were especially needy.) The New Orleans Waterworks Company was perceived as a profit-gouging monopoly that delivered little for what its services were costing the city and its citizens, many of whom were getting their household

water by collecting rainwater in cisterns. It was not surprising that the waterworks was the brunt of Mardi Gras sarcasm.⁷

The year the New Orleans Waterworks Company began, 1877, was the year in which Reconstruction ended and Louisiana took control of its own government without the presence of Federal troops. During the Civil War, women had assumed some leadership while men were absent. During Reconstruction, many New Orleans men, as former Confederates, were still precluded from much public activity and often it was the women who stepped forward. In the period following Reconstruction, these same women increasingly took public stands and worked to gain more power for themselves. It was also at this time that women on the board of St. Anna's Asylum in New Orleans were appalled to learn that the institution could not receive a bequest from a female resident because the only witnesses to her will were the women board members. This prodded the board president, Caroline Merrick to address the 1879 Louisiana State Constitutional Convention to ask for more rights for women. The affluent Merrick, who would be active in women's rights causes and would lead the Louisiana Women's Christian Temperance Union for ten years, was heard, but concessions were modest: women were given the right to serve on school boards and even this was not enforced. Merrick would continue her involvement in women's causes.⁸

The decade of the 1880s saw a number of women's organizations formed in New Orleans, and meanwhile the women of New Orleans were gradually forging alliances with women elsewhere in the country. The Christian Women's Exchange, aiming to help working women, was founded in 1881. The New Orleans Women's Club was formed in 1884, and would become a member club of a national federation of such clubs by 1889. In 1885, when Caroline Merrick was asked by mid-westerner Frances Willard, national W.C.T.U. president, to head up a

W.C.T.U. in Louisiana, she readily agreed. When the World's Cotton Centennial Exposition opened in the city in 1884, Julia Ward Howe, who had been a strong supporter of the North in the Civil War, was put in charge of the women's department, with Merrick as her deputy. Howe's selection caused some controversy, but she ultimately met with acceptance and shared her enthusiasm for active women's groups: more were formed in the city.⁹

Some of these clubs were designed so that women would study, learn, and then share their knowledge with fellow members by presenting papers. At a time when there were few opportunities for higher education for women, these clubs were a valuable resource. Formed in 1886, the Quarante Club, named for having the same forty membership spots as the Academie Française, grew out of a Shakespeare study group. Members presented papers before the group (as they do today) and thus the fad, noted in Boston a few years earlier, spread south. The culmination of the New Orleans drive towards education for women at this period was the founding, in 1886, of the H. Sophie Newcomb Memorial College for Women, established by Josephine Newcomb in honor of her late daughter and destined to become a coordinate college of Tulane University.¹⁰

The 1881 Queen of Carnival, Cora Slocomb, reigned over a city in which women were beginning to be awakened by new knowledge and a new sense of purpose. As a young woman, Cora had a comfortable life, and by the time of her reign was a well-traveled nineteen-year-old with command of several languages and a talent for art. Her mother was a northerner, a Quaker, but her father, Cuthbert Slocomb, who died when she was eleven, had been a loyal Confederate and even provided financing for the city's prized military unit, the Washington Artillery. Colonel Slocomb, as he was known, was a prosperous merchant, president of a bank, and presided over a luxurious household at 1205 Esplanade Avenue. Cora and her mother continued

to live in the family home when not traveling. It was during a trip to Italy that Cora met Count Detalmo di Brazza and fell in love. The two would marry, in New York, in 1887, and make their home in Italy.¹¹

The di Brazza marriage was a success: not only did Cora and Detalmo love each other, they agreed on principles. They had only one child, a daughter, Idanna, but since Detalmo was one of fifteen children they had an extensive family around them. Detalmo was a gardener who is still remembered for his work with heirloom violets and the Countess shared his passion for the outdoors. Both of them believed in the rights of women, and her husband was supportive of the Countess's multi-national charity work and her writing – she spent most days at her typewriter. She rushed to the aid of Italian villages struck by disaster, she supported and encouraged local lace makers, she published an ethnologically correct novel about the Pima Indians of the American West, illustrated with her own drawings. Intelligent, committed, and impulsive, the Countess became a force to be reckoned with. In 1895, she heard of the plight of a young Italian immigrant woman in New York, Maria Barbello. The Countess left Italy, rushed to New York, and hired lawyers to defend Barbello, who had murdered her abusive fiancé and was about to become the first woman executed in the electric chair. The news stories were sensational, the Countess called on elected officials, talked to the press, and after two years of struggle and several trials, Barbello was acquitted.¹²

It was during her time in New York that the Countess became familiar with the work of a new organization, the National Council of Women. One of the aims of the group was to set up similar organizations in other countries, and Italy was one of their prospects. The Countess was most interested in one of the National Council's committees, International Peace and Arbitration, so she became a member and, as chair of the peace committee, began serving on the council's

board. It may have been her Quaker heritage, with its emphasis on peaceful solutions, that drew her to the group, but it was the lessons in organizational strategy that she would learn here and pass on to the women of New Orleans.¹³

The National Council of Women was founded as a result of the 40th anniversary celebration, in 1888, of the Seneca Falls Women's Rights Convention of 1848. That earlier event was the outgrowth of the meeting of two American women, Elizabeth Cady Stanton and Lucretia Mott, at an anti-slavery convention in London, at which Mott was denied a seat because of her gender. They vowed to begin organizing American women to unite to secure their rights, and the Seneca Falls, New York, conference, with over 300 in attendance, was the result. The struggle for suffrage was a long one. Only Charlotte Woodward of New York signed the Seneca Falls Declaration of Women's Rights and lived long enough to cast a vote for the U.S. President in 1920.¹⁴

By 1888, the women's movement was growing across the country. One of the strongest women's organizations was the Women's Christian Temperance Union, headed by the energetic Frances Willard. Willard was an educator, a dean of a women's college that would be absorbed by Northwestern University of Evanston, Illinois. Alcohol consumption in the post-Civil War era was viewed as a major social problem, prohibition was a popular cause, and the W.C.T.U. grew rapidly. Even though the temperance cause could reflect prejudice against the growing numbers of poor Catholic immigrants in urban centers, alcohol was not the W.C.T.U.'s only focus, so it could gain adherents in Catholic Louisiana. Willard soon saw the importance of women's suffrage to the temperance campaign: she promoted women's using the vote to protect their homes and families and against social ills. This "home protection ballot" in which women would be able to vote on social issues was the W.C.T.U.'s first foray into suffrage promotion:

eventually Willard would see suffrage as a natural right of women, with voting allowed on all ballots. Besides speaking out for her cause, Willard traveled the country to nationalize her organization, and thus she sought out Caroline Merrick and saw Louisiana establish a state W.C.T.U. chapter.¹⁵

For the important 40th anniversary celebration of the Seneca Falls Conference, the various organizations promoting women's suffrage called an International Conference of Women for Washington, D.C. Thus the rapidly growing U.S. women's movement reached out to women in other countries, and the meeting was so well received by the attendees that it was decided to form a permanent alliance. The newly formed National Council of Women of the United States was composed of representatives of various women's organizations, and Frances Willard was elected president. Members of the National Council also drafted and accepted a mission statement, radically inclusive in its aims.

"We women of the United States of America, believing that the best good of humanity will be advanced by efforts toward greater unity of sympathy and purpose, and that a voluntary association of individuals so united will best serve the highest good of the family, the community, the state, so hereby freely band ourselves together into a federation of all races, creeds and traditions, to further the application of the Golden Rule to society, custom and law"¹⁶

Willard was not the only N.C.W. founder familiar with Louisiana: Julia Ward Howe was also a founding member of the group.

Now that there was a national framework in which women's organizations could cooperate, Willard saw the need for such groups on a local level. She saw these groups as lobbying forces that would both inform and unify the various local women's organizations and coordinate action. Women, through their clubs, were widening their personal spheres and

Willard wanted to harness that energy to include wider public interests as well. One such group, the Chicago Women's League, began operations later in 1888.¹⁷

The Chicago Women's League was created by club women but would represent fifty-six women's organizations, including everything from missionary societies to labor unions, and a similar group, the Illinois Women's Alliance, where the impetus for organization came from union women rather than club women, was formed at about the same time. The I.W.A., from its beginnings, included African-American women's groups, as the original mission of the National Council advocated. Other local organizations springing from the National Council were formed in Providence, Rhode Island; Memphis, Tennessee; Portland, Maine, and Minneapolis, Minnesota.¹⁸

In New Orleans at this period the struggle for women's suffrage was gathering steam. Again, Caroline Merrick stepped to the fore and helped found the pro-suffrage Portia Club in 1892. Taking into account the rights that women received from the Louisiana State Constitutional Convention in 1879, the club helped four women receive appointments to school boards in north Louisiana parishes. Another suffrage group, the Equal Rights for All, or ERA Club, began in 1895. Kate Gordon was the first ERA Club president, and she and her sister Jean Gordon would afterward be identified as important women's suffrage activists in the state. The ERA Club would grow in membership.¹⁹

The women of New Orleans had also banded together to fight, successfully, against the powerful Louisiana Lottery. Merrick was proud that women of all classes and ages had joined the Women's Anti-Lottery League and united in the struggle. No doubt the women's efforts were perceived as impressive throughout the entire community. When the problem of political

corruption tied to the lottery was being handled, another long-standing local issue came to the forefront of New Orleans interest: sewerage, water and drainage system needs.²⁰

While the water system was unsatisfactory, the drainage and sewerage systems were in even more deplorable condition. Actually, there was no sewerage system at all. Drainage had been relegated to local government and various failed corporations, but apart from a few ineffective steam engines positioned in canals, there was no effective way to drain any water out of the saucer-like city. The situation was desperate, and not only because it made living in the city unpleasant. The businessmen of the city knew that the local economy could not thrive if the city did not modernize. The health community of the city knew that if water, drainage and sewerage were not improved, residents would sicken and many would die. What was needed was a massive push to build a completely new water infrastructure. It would be costly. It would require coordinated efforts of the business and health communities, the populace, the state legislature and local government. More than that, it would require that public opinion would be swayed so that all were in agreement: whatever effort it took, New Orleans would have a modern water, drainage and sewerage system.²¹

On January thirty-first, 1898, a meeting was called at the St. Charles Hotel in New Orleans to discuss the formation of a Local Council of Women. The Countess di Brazza, who had instigated the meeting and personally appealed upon the gentlemen present to take part, explained how the organization would function, and was joined in her appeal by local activists Kate Minor and Belle Perkins of the New Orleans Women's Club. In the audience were representatives of women's organizations. On the podium with the women were a phalanx of the most influential men in the city. Attorney Ernest B. Kruttschnitt, who also was head of the Democratic State Central Committee and president of the School Board, called the meeting to

order. With him were the current Mayor, Walter C. Flower; Dr. Stanford Chaille, Dean of the Tulane Medical College, and clergymen including James Cardinal Gibbons, Rabbi Isaac Leucht of Touro Synagogue and Dr. Beverley Warner of Trinity Episcopal Church.²²

The Local Council would have civic betterment as its purpose and exist “to promote the welfare of its city,” and “to promote hygiene and a knowledge of civic and sanitary obligations.” As the Countess said, “what is needed now is an awakening to the responsibilities that the citizens owe their beloved city.” She added, “we as ladies can accomplish a great deal.” Moreover, the Local Council, by uniting women’s organizations, could “prosecute successfully large enterprises, . . . outside the scope of any single group.”²³

The group adopted resolutions, officially formed the Local Council, and elected Sophie Wright as president. The organizations, which would each have two representatives on the council, included, among many others, the W.C.T.U., the Portia Club, the ERA Club, the National Council of Jewish Women, the Confederate Memorial Association, Sophie Newcomb Alumnae, Society of St. Vincent de Paul, King’s Daughters, Christian Women’s Exchange, Stenographers Association, Lepers Aid Society, Quarante Club, House of Good Shepherd, Teachers Benevolent Association, ladies of the Press Club, Hebrew Aid Association, and, in all, the Local Council would invite 147 organizations to join, enroll 134 at the high point of its membership strength, and count 108 as bona fide dues-paying members.²⁴

The Local Council began holding regular meetings, forming committees including Education, Sanitation, City Embellishment, Social Reform and Publicity. The first project called for a program of Mardi Gras lectures for tourists, and the publication of the speeches for national distribution. The Countess di Brassi chaired this remarkable event at the French Opera House, filled for the evening with local performers including African-American female vendors with

their wares. The Local Council soon received an invitation to send exhibits to the Trans-Mississippi and International Exposition in Omaha, Nebraska. However, an event closer to home would prove far more important: the 1898 meeting of another Louisiana State Constitutional Convention, held in New Orleans that March.²⁵

The Local Council minutes record the note that Carrie Chapman Catt, nationally active in the struggle for women's suffrage, would speak at the convention. The ERA Club and "its sister," the Portia Club, both Local Council members, submitted a petition to the convention, calling for extension of the franchise to women. In the delegation were both Caroline Merrick and Kate Gordon. Women of New Orleans waited to learn the outcome of their lobbying efforts.²⁶

The document resulting from the convention, the 1898 Louisiana Constitution, actually instituted severe restrictions on the franchise, and sharply curtailed the number of African Americans allowed to vote. But, the women made a small gain. They won the right to vote their property, in person or by proxy. This was important because, in that day, all ballot items having to do with property taxes had to be approved not only by a popular vote, but also by a vote of property holders of a majority of the assessed valuations in the taxing district.²⁷

Securing the right to vote their property assessments was an important step in empowering New Orleans women. Three years prior to the Constitutional Convention, the ERA Club had undertaken a project specifically aimed at exposing the problems of property assessments. The ERA Club, with volunteer members and some paid staff, had copied out details on over 50,000 properties in the New Orleans assessment books, including the property measurements, the assessed valuations, and the names of the owners. Then, with the help of the one union newspaper in town, the New Orleans City Item, they had the type set, printed the

booklets, and sold them for a minimal charge. Publication of this data exposed two things: women owned the majority of property, and assessments were unequal. As Jean Gordon, ERA Club president, noted in her introduction, “it must be evident to any casual reader that... something is wrong when great business firms...are assessed .. for only a few thousands of dollars!” The ERA Club report proved that women paid more taxes than men, and the 1898 Constitutional Convention finally gave them partial representation in voting on how they were taxed. Knowing that the next vote on taxes would be to support the needed water infrastructure, Kate and her sister Jean Gordon of the ERA Club formed an organization called the Women’s League for Sewerage and Drainage, and focused efforts on informing women of their right to vote their property, gathering petitions signed by women (as property voters) so that the required number of voters having called for an election, it would be held; and on election day they made sure that women’s property votes were cast.²⁸

New Orleans women had also taken to the streets to document sanitary conditions. City Hall pledged its assistance, and the Sanitation Committee organized its members according to their Wards, with the aim of reporting violations and non-compliance with ordinances, and “effecting cleaning up of the premises and streets over which they had charge.” The members of the Sanitation Committee began meeting on a regular basis – with fewer meetings in Summer months – and made reports on neighborhood problems. They depended on the City Administration to furnish them with leaflets on city ordinances, such as rules for proper garbage disposal, which they distributed in their neighborhoods. The women of the Sanitation Committee were not all residents of the best neighborhoods: their home addresses on the membership list show that these women came from varied economic conditions and were very likely to have had a broad view of overall city conditions. And, those working to improve the

city's water systems were well aware of the Sanitation Committee's work: serving for a while as committee secretary was the wife of George Earl, the engineer who would actually design the complete sewerage, water and drainage system. The women knew that documenting needs was important if needs were to be met.²⁹

A typical committee complaint was one against "an Italian called 'Pete' who has a [vegetable] stand at the corner of Joseph and Laurel Streets" and who was throwing garbage in the gutter and letting his goats run free. A note asking for enforcement of applicable ordinances was sent to City Hall. The committee moved that school children be asked to bring their own drinking cups from home and not share a communal cup. The committee came out in support of pure milk legislation. Members canvassed and raised money so the city could flush the gutters since there was nothing in the public treasury to pay for this service. They notified the city when lots were overgrown and grass needed cutting or when sidewalks needed repair.³⁰

The women's zeal in pointing out problems was misinterpreted at one point by the head of the city's Department of Health. On March 28, 1898, the Local Council hosted a meeting to discuss the city's sanitation and water problems. Dr. Quitman Kohnke took this opportunity to issue a warning that "house to house inspections" would be resented by New Orleans housewives. Sophie Wright, who was presiding over the meeting, immediately snapped back "I must disclaim for once and all any idea of our ever intending to organize a system of house-to-house inspection. We leave that to the Board of Health." She added: "Our desire is to aid this body by enlisting a spirit of civic pride and responsibility in the hearts of all."³¹

The sad state of the city's water system formed the discussion topic for the remainder of the meeting. How could the poor be clean when they could not afford the water rates? Dr. Kohnke replied that the private company with the water franchise was to blame. And how long

would that franchise last? “I don’t know,” answered Dr. Kohnke, “but practically forever. The company is satisfied with existing affairs. It is making money.” The opening of fire plugs in summer, for the relief of the poor and for flushing of gutters, was the cause of much complaint by the company. “When all the plugs are opened [the company] is unable to furnish water” to its paying customers, he explained.³²

“The only solution of the water works question implies purchase of the water works by the city,” Kohnke said. “We are contemplating this step now,” he added. Not only was action contemplated, work had already begun.

Buying the water works company’s property would keep the city of New Orleans in court until nearly a decade into the next century. But, the problems of the drainage, sewerage and water systems were gradually being solved on several fronts. The Louisiana State Legislature had begun in 1896 by setting up a drainage board for New Orleans, and some canal work improvements had begun. It was obvious that the entire water system needed to be improved: the problem was paying for it. The city had been granted the right to issue bonds, but the citizens had to vote to approve a bond issue, and an election had to be called. The ideal time to hold the election would be June 6, 1899, but much work had to be done in advance. Organizations had been forming to support election efforts for a new system, including the Municipal Improvements League in 1897. The New Orleans Progressive Union incorporated as a non-sectarian, non-political organization on March 13, 1898. Added to those was the ERA Club entry, the Women’s Sewerage and Drainage League.³³

There was, however, a limit to civic organizing. At the March 28, 1898, Local Council meeting on water problems, a Mrs. Vaught proposed that a comprehensive “Women’s Protective Health Association” be formed, and that Mrs. Sylvania Williams “be enlisted to bring the

colored women into the association to promote sanitation.” The motion was defeated and it was decided to keep all efforts under the Sanitation Committee of the Local Council. The idea of inter-racial inclusion was not popular in New Orleans. The Local Council continued to avoid becoming an affiliated member of the National Council, even if the Countess di Brazza was on the national board, and it could have been because the National Council at its beginnings, and in its present-day membership, includes several African-American groups. Kate Gordon herself would fight against Louisiana’s ratification of the 19th Amendment because the federal law would give African-American women the right to vote.³⁴

On Election Day, June 6, 1899, the turn-out for women’s property votes was high. The Women’s League for Sanitation and Drainage, as The Times-Democrat noted the next day, “labored unceasingly” for five months: collecting signatures on the petitions to call the election, tracking down addresses of women property owners, informing them of their right to vote their property, and collecting proxies for those who did not go to the polls themselves. Kate Gordon and her workers voted proxies all election day. The result was a triumphant win: 6,089 votes and \$35 million in property voted yes and only 389 votes and \$1.5 million in property voted against assessing the tax to fund the infrastructure system. The move to make the board appointive rather than elective also passed. The Times-Democrat called the vote “a victory for the women of New Orleans.”³⁵

The Daily Picayune had become conservative since the death of Eliza Nicholson in 1896, and had run editorials against the women’s right to vote their property. Nevertheless, the front page of the Picayune had a cartoon of a woman with a sash labeled “New Orleans” seated (side-saddle fashion) on a horse labeled “Progress” jumping over an abyss titled “Sanitary Neglect and Commercial Stagnation” to the other edge named “To a Greater City.” “Let the

credit go where it belongs,” The Picayune said. “the women of New Orleans” earned it themselves.

When long-time New Orleans Mayor Martin Behrman addressed the League of American Municipalities in 1914 to tell the story of New Orleans’ great water projects, he gave credit to “the many ladies, through their respective organizations and as individuals” who helped educate the public on the importance of the work. Ironically, Behrman was a typical machine politician and never a strong supporter of women’s suffrage, and was addressing a Progressive and anti-machine organization, praising the political work done by women, none of whom had ever voted for him. New Orleans women may not have been able to vote for their Mayor, but they certainly knew their politics.³⁶

The women’s victory brought real change to their city. The new water infrastructure of New Orleans would ultimately remove the threat of epidemic disease when mosquitoes were found to be the vectors of yellow fever and standing water breeding places were eliminated. It enabled the city to have purified water for the first time, and to have the benefits of a sewerage system. Drainage problems were eased. It was a great victory, and the women rightly took pride in it, and if full suffrage did not come until 1920, they were ready to continue working for it.

Minutes and records of the New Orleans Council of Women do not go beyond 1901. Presumably the organization gradually ceased to function. There were only 22 recorded members in the last report. The National Council of Women, headquartered in New York, still exists and maintains a web-site. As late as 1928 the yearbook had one New Orleans national board member, Ida Friend, president of member organization the National Council of Jewish Women. On a sad note, Countess di Brazza, at the age of 44, suddenly became psychotic. From the inception of her illness in 1906 until her death in 1944 she was secluded in Italy, with her

faithful husband nearby. All her New Orleans mementos and diaries were burned in a 1917 fire set by the occupying Austrian Army. Caroline Merrick died at 83 years of age in 1908, never having had a chance to cast the vote for which she had worked so devotedly.³⁷

The project the women struggled for was a success. By 1915, the Sewerage and Water Board had spent \$27.5 million on the construction of water, sewerage and drainage systems. In 1973, on the seventy-fifth anniversary of the Sewerage and Water Board, the Louisiana Engineering Society selected the system as one of the ten most outstanding engineering achievements in the state. Pumping stations in the system were named as National Historic Landmarks. The systems would still be serving the city in 2005 when New Orleans faced the greatest natural disaster in its history: Hurricane Katrina

End Notes

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⁶ Conseil de Ville meeting 9 September, 1820; 30 April, 1821; 30 June, 1821; New Orleans City Archives Collection, New Orleans Public Library; Report of the Water Works Committee of the Commercial Bank of New-Orleans. Presented February 18, 1836, and Published By Order of the Board of Directors (New Orleans: Gaston Brusle, 1836); John Tylden Magill, "Municipal Improvements in New Orleans in the 1880's" M.A. Thesis, University of New Orleans, 1972.

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¹³ New Orleans Local Council of Women, minutes 5 February 1898, 19 February 1898, Archives of the New Orleans Local Council of Women, Louisiana Collection, New Orleans Public Library.

¹⁴ Lindig, 2-11; Ruth Bordin, Frances Willard: A Biography, (Chapel Hill: University of North Carolina Press, 1986,) 152.

¹⁵ <http://www.brittanicaonline.org>, "Frances Elizabeth Caroline Willard"; Bordin, 68-75, 100-110.

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¹⁹ Tardo, 22-23; Lindig, 60-61

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Martin Behrman, Mayor of New Orleans, before the League of American Municipalities, Milwaukee, Wis., September 29, 1914).

²² New Orleans Local Council of Women, minutes 31 January 1898

²³ Daily Picayune 1 February, 1898

²⁴ Daily Picayune, 1 February, 1898, minutes of New Orleans Local Council of Women, 31 January, 1898; minute books of the Sanitation Committee of the New Orleans Local Council of Women, Louisiana Collection, New Orleans Public Library.

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The Local Council of the Women of New Orleans, under the auspices of the New Orleans Progressive Union, with Countess Cora Slocomb di Brassi as chair, presented a program Friday afternoon of the weekend before Mardi Gras at the Grand Opera House with performances, speeches by local dignitaries, and a display of a “glory of color...contributed by old Negro mammies ... who sat in a row with baskets in their laps contained babas, calas, pralines, nougat.....” Guests included the officers of a French and an Austrian ship, various tourists, and “a large representation of New Orleans society.”

²⁶ Merrick, 221-223; Local Council Minutes 26 February 1898

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³⁰ Minutes, Sanitation Committee, New Orleans Local Council of Women

³¹ Daily Picayune 29 March 1898

³² Daily Picayune 29 March 1898

³³ Daily Picayune 29 March 1898; Robert Dupont, “Progressive Civic Development and Political Conflict: Regular Democrats and Reformers in New Orleans, 1896-1912.” Ph. D. diss., Louisiana State University, 1999. 179-219; The Progressive Union would rename itself the Association of Commerce in 1913. This was the predecessor of the Chamber of Commerce of New Orleans and the River Region. Daily States, 31 August, 1899 and 24 April, 1913.

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³⁶ Behrman, 4.

³⁷ New Orleans Local Council of Women Archives; Pucci, 308-310 (Idanna Pucci is the great-granddaughter of Cora Slocomb di Brazza)

Chapter 10: Hurricane Katrina and the Sewerage and Water Board

By August of 2005 the Sewerage and Water Board presided over a massive infrastructure that had been augmented and improved over time, but was still undergoing renovations and extensions, mainly to comply with Federal rules for sewage disposal and water purity. When it was first organized, the board's funding came from a two mil property tax, and one half of the surplus funds from a one per cent public debt tax, also charged on property.

Sitting on the Sewerage and Water Board today are the Mayor, the two at-large members of the City Council, one district Councilman, seven citizens from various neighborhoods of the city, and two representatives from the Board of Liquidation of the City Debt. The board meets monthly in public. Funding now comes from Federal matching funds and from three, six and nine mil property taxes allocated to the board. The system's drainage pumping capacity in 2003 was over 29 billion gallons a day, enough to empty a ten square mile lake 13.5 feet deep every 24 hours.¹

By 2003, a cooperative program between the U.S. Army Corps of Engineers and the Sewerage and Water Board, the \$140 million Southeast Louisiana Urban Flood Control Project (SELA), had been activated to work toward building new pumping stations and canals to help solve the recurrent problem of flooding after rains. Federal funding covers 75 per cent of the cost. The Sewer System Evaluation and Rehabilitation Program (SSERP) is supposed to be a \$200 million program to study and repair the sewerage system, now aging. Another modernization project is the Supervisory control and Data Acquisition computer system, SCADA, intended to provide online monitoring of the system. In the water system, the Environmental Protection Agency has never found a violation of clean water standards in New Orleans's water system since standards were introduced in the 1970s.²

Thus, at the beginning of the 21st century, the New Orleans Sewerage and Water Board presided over an aging system, but was working toward modernization with the help of Federal funding. The board even experimented with privatization, jobbing out some technical chores at a sewerage lift station and, with great fanfare, considering but ultimately rejecting privatization of the entire system.

New Orleans's water problems seemed to be under control. However, the Sewerage and Water Board did not control everything concerning water. The system of flood protection, and of levees for hurricanes, had long since come under the auspices of the U.S. Army Corps of Engineers. This Federal control of flood protection was an outgrowth of the vast flooding of the Mississippi River in 1927. In essence, everything that had to do with levees was then put solely under control of the Corps of Engineers – they decided what to do, they decreed how to do it, they judged whether it had been done correctly. Power to choose technology was completely out of the hands of any New Orleanian. Neither officials, nor business community members, nor voters, nor Sewerage and Water board employees, nor even Orleans Levee Board employees who might have governance in name but did not in substance, had any power over the city's defense against river or lake flooding.

After the great river flood of 1849, Congress passed the Swamp and Overflow Land Act of 1850. Louisiana received 8.5 million acres of swampland. The idea behind this transaction was that the state would sell the land and either use the proceeds for flood control or the new landowners would institute flood control measures to protect their investment. The intervening Civil War and the lackluster economy kept this from happening. Only after James B. Eads opened the river with jetties did flood control begin in earnest. The Federal government formed a flood control oversight group, the Mississippi River Commission, which still today has five

members representing different localities along the river and which is chaired by a U.S. Army Corps of Engineers representative. By 1898, Louisiana had designated riparian areas into Levee districts, each to be governed by its own board. However, the responsibility for levee building, design, and control lies with the Corps of Engineers. The Corps is also in complete charge of the Hurricane Protection System in the New Orleans area.³

The 1927 Mississippi River flood inundated 26,000 square miles. New Orleans was spared, but the fear of flooding had led the local business establishment to force the dynamiting of the river levee downstream in St. Bernard Parish. Only decades later did the landowners of St. Bernard receive recompense for this. Another result of the flood was that the Federal Government allocated \$300 million for flood control. With Federal money and with the Federal government in charge, there seemed little necessity for local levee boards. However, the levee boards are necessary for the system to function. Ed Preau, 2006 Assistant Secretary for Public Works and Intermodal Transportation at the Louisiana State Department of Transportation, also serves as secretary of the Association of Levee Board of Louisiana. As he explained, “The Corps, even for the federal levees, requires that there be a non-federal sponsor to own and maintain the levee.” Since 1986, the non-federal sponsors have also been expected to share in the costs. Thus, the levee boards can furnish the Corp the right of way for the land on which the levees sit, and, from their local taxes, they can help pay for levee work. In fact, the levee board may have its own local funds, but any Federal money for levees always goes directly to the Corps of Engineers.⁴

In New Orleans, the Corps of Engineers also was concerned with the walls of the drainage canals. There are three main drainage canals, or outfall canals, going across the city to the lake: on the Western side of the city at the Jefferson Parish line is the Seventeenth Street

Canal, the others are the Orleans Avenue Canal and the London Avenue Canal. The Eastern end of the City of New Orleans is divided from the rest of the city by a navigable waterway that runs from the Mississippi River to Lake Pontchartrain. The Industrial Canal was a late project of the Progressive era and was inaugurated in 1921.

The flood of 1849 was the last great Mississippi River overflow into New Orleans. However, the city regularly flooded, either from heavy rains that could not be drained quickly enough; or from rising waters in Lake Pontchartrain. Hurricanes had hit New Orleans from its earliest years: the town was destroyed in 1722 by a storm. In the twentieth century a 1947 hurricane sent water from Lake Pontchartrain into Jefferson Parish and the Western side of New Orleans. This flooding brought about changes in the levee system along the lake, and more Corps oversight for the 17th Street Canal, beginning in 1955 when Congress authorized planning for the Lake Pontchartrain and Vicinity Hurricane Protection Project. Hurricane Betsy in 1965 flooded Eastern New Orleans when the Industrial Canal and the London Avenue Canal overflowed. The city began experiencing general massive street flooding from rainfall beginning in May of 1978. The Sewerage and Water Board launched extensive projects to improve drainage in the area centered between the river and the lake above the Industrial Canal. The struggle to contain water, to keep water from the streets and homes of New Orleans, became both a matter of protection in guarding the shores of the river and lake, and of prevention, in enabling the canals to safely take water away from the city. Thus, canals, like the Seventeenth Street Canal, might come under the attention of the Sewerage and Water board for drainage, but also from the Corps of Engineers and the Orleans Levee Board because the canal walls were part of the hurricane protection levee system.⁵

And then came Hurricane Katrina, August 29, 2005.

The storm was expected: not only because of weather reporting, but because the possibility of a hurricane existed annually for Louisiana. Indeed, disaster drills had been held in a prior year for a “Hurricane Pam” a fictitious storm, that ably demonstrated what a fierce tempest could do to the city. Hurricane Katrina’s eye passed slightly to the East of New Orleans, and at landfall it was most likely a Category 3 storm with winds up to 110 miles per hour. Had damage come only from wind and rain, the city would have been battered and bruised, but recovery would have taken only a matter of a few months. The disaster came via canal.⁶

A Congressional Committee investigating the “Preparation for and Response to Hurricane Katrina” issued a report that succinctly described what happened in the storm.

Because the eye of Katrina passed just slightly to the east of New Orleans, the hurricane threw unusually severe wind loads and storm surges on the flood protection systems. The surge overtopped large sections of the levees during the morning of August 29 east of New Orleans, in Orleans and St. Bernard Parish, and it also pushed water up the Intercoastal waterway and into the Industrial Canal. The water rise in Lake Pontchartrain strained the floodwalls along the canals adjacent to its southern shore, including the 17th Street Canal and the London Avenue Canal. Breaches along all of these canals led to flooding of 80 percent of New Orleans to depths up to 20 feet. The flooding of central New Orleans led to the most widespread and costly damage of the hurricane.⁷

It could also be possible that the Seventeenth Street Canal breach might have occurred because that canal was draining far more land area than was originally intended.

Wesley Busby, Design Engineer for the Drainage, Sewer and Water sections of the Sewerage and Water Board, was convinced that the Seventeenth Street Canal was never intended to drain as much land as it actually drained, and that flooding was the result. As Busby explained, a project in the 1870s to build a canal from the river to the lake in Jefferson Parish was never completed. However, a small canal, Hoey’s Canal, was dug during beginning construction near the river, from which point it ran in the direction of the lake. In 1915, after a hurricane, the Orleans Levee Board built a Protection Levee running from the river to the lake near the

Jefferson Parish line. A small cut for a culvert was made in the levee for Hoey's Canal, and this Hoey's Cut then drained into the Seventeenth Street Canal. The cut was dammed at the time of the 1927 river flood, but was later open and expanded. Ultimately, the Hoey's Cut would carry drainage rainwater from 2,500 acres of Jefferson Parish extending upriver several miles.⁸

When Hurricane Katrina piled up a storm surge of water in Lake Pontchartrain, the main outfall canals were still pumping water into the lake. However, as the level of the lake rose, lake water began backing up into the canals. Then, even before they had reached their designed capacity, the walls of the Seventeenth Street and London Avenue Canals gave way in breaches. Lake water began to pour into the city. The pumps were shut down since all they were doing was recirculating the floodwater that was pouring in to the city. As became clear later, the walls themselves were at fault. After taking a week to close the breaches on the Seventeenth Street and London Avenue Canals, and patch the Industrial Canal wall which also failed, the Corps of Engineers began the process of "unwatering" the city. Complicating matters was the advent of Hurricane Rita, which drove more waters in through the Industrial Canal breaks. As the flood waters receded, efforts began to patch the canal walls and attention was paid to their construction. As it turned out, the walls had collapsed because they had not been properly designed for the soggy soil in which they sat. Fingers of blame were pointed, but the responsibility was ultimately laid at the feet of the Corps of Engineers. As *The Times-Picayune* noted: "the designs approved by the corps were too weak to cope with the shaky soils."⁹

The Sewerage and Water Board, which had designed the drainage plan for the city, had not been able to oversee that part of their system that the Corps of Engineers controlled. And yet, it had been the Sewerage and Water Board that put the pumping stations inland from the lakefront, a possible contributory factor in the flooding and a design flaw that may yet be

remedied in reconstructing the outfall canals of the city. As the floodwaters receded, the extent of the damage became evident: not only the drainage system but the water and sewerage systems had suffered greatly. The system was old, and it took a massive beating from the storm and the flooding.

In Hurricane Katrina, science and technology failed against the power of nature.

End Notes

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⁵ 29 January, 2006 The Times-Picayune.

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Conclusion: Crescent City: Post Apocalypse¹

This past August my husband and I evacuated New Orleans, the first time we had ever fled the city because of an approaching storm. Before we left I wrapped the family portraits in wool blankets and left them in the stairwell in hopes of protecting them from wind and rain, thinking to myself that this is what Southern women had done as the Civil War approached. Then we crept slowly out of town, our technically perfect highway system near parking-lot status, and headed north toward refuge in a spacious country house filled with friends and good food and talk. It was like being Dorothy in Technicolor Oz after the black and white tornado.

No one ever talks about what home looked like when Dorothy clicked her heels and went back there.

Katrina was so vast, so horrendous, so biblical in scope that I have trouble wrapping my mind around it. Places I know and love are fractured, demolished, flattened, coated with mold. Some New Orleanians, like us, were fortunate. Our homes and roots are in the older sections of the city near the river, and we have our little community back. After being gone a month we returned, and quickly enough the phone and lights and gas and even television cable were working, the neighborhood grocery store open, along with some restaurants. What's missing is that newer part of the city, the areas near the lake and toward the east. And the people who lived there are missing, too. Gone is most of the port, the framework of the vast petrochemical industry. The pine forests north of the lake are no more, the resort areas along the Mississippi coast are no more, our protective marshlands and barrier islands are barely there.

Coming back home after Hurricane Katrina, I returned, in a sense, to the city of my great-grandmother. As at the end of the nineteenth century, there is a crescent of populated area on the

high ground along the Mississippi River, while to the north and east the low-lying earth verges into swamp and marsh, with habitable housing sparsely dotted across the expanse. The new subdivisions of the twentieth century, the areas of post–World War II expansion, filled again with floodwaters, as they have regularly done since the city was founded in 1718 by French Canadian fur traders looking for an entrepôt in the south. A typical eighteenth-century Louisiana house (say, Madame John’s Legacy, on Dumaine Street) attests to the realities of living here. The first floor is intended for storage only, the living area on the second floor is raised far above the ground, the walls are thick and strong, overhanging roofs shade all the openings, shutters cover the windows. It is a habitation designed for a hot climate with frequent flooding.

New Orleans is a city with a good situation: located where trade routes cross, near the mouth of a river that drains one of the great agricultural regions of the world, with the Gulf of Mexico accessible by river or bayou and the inland South via the rivers that empty into Lake Pontchartrain. New Orleans is also a city with a bad site: a bowl of land rimmed on one side by the river and on the other by the brackish lake. The city exists only by virtue of a massive, and massively complex, technological system for dealing with water, the city’s best friend and worst enemy.

The technological tragedy of New Orleans historically lies at the confluence of science and engineering, on the one hand, and power on the other—the power to choose the science and technology we get. The city’s colonial Spanish governors might have availed themselves of the same technology that drained and made habitable Mexico City, but their crumbling empire’s finances made that impossible. After the Louisiana Purchase its American rulers might have used public funds to build levees and drain the swamps, but they left that mostly to the private sector. Of course, the profit motive can be a powerful stimulus, and the private sector built the

technological infrastructure that supported the pre-Civil War cotton-and-sugar economy that fueled New Orleans' slavery-era expansion.

The profit motive influenced public infrastructure technology choices, too. New Orleans gave the lie to the old real estate bromide: "Land—they're not making any more of it." Private companies built drainage canals, installed steam engines to pump water from adjacent land, and profited from the increase in its value. After the nineteenth-century expansion toward the interior, stretches along Lake Pontchartrain were filled in the 1920s and the area far below the Industrial Canal (another Progressive-Era project) was drained. New Orleans East became a mass of subdivisions beginning in the 1970s.

The city's current water infrastructure involves drainage, sewerage, and supply. When it was built, circa 1910, it was the largest infrastructure project undertaken in the United States up to that time. The Sewerage and Water Board is a nongovernmental agency, administered by appointees who include elected officials. It has a say in the operation of all three subsystems, although the U.S. Army Corps of Engineers approves engineering. Sewerage is pumped from the city, treated, and discharged into the Mississippi River downstream. The river supplies the city's potable water as well. Rainwater is drained off toward Lakes Pontchartrain and Borgne via a maze of canals, some open, most covered. Twenty-three pumping stations and 140 pumps lift the water up and out.

But despite New Orleans' valiant and creative attempts to design its water infrastructure, the city has little effective control over it. Power has shifted from local and state governments to the federal government, and along with it the ability to make the crucial technological choices.

In the case of flood protection, decision-making power now resides with the Corps of Engineers, as it has for some time. Historically, the federal government began making flood-

control policy with the Swamp Land Act of 1850, which gave federal riparian lands to states so they would build levees to protect land they could then sell to private owners. Gradually the Corps of Engineers assumed control of the river levees, and after the 1927 Mississippi River flood the federal government took on an even greater role in engineering the river. Today the levees, the canal walls, the entire hurricane protection and flood control system are all controlled by the Corps of Engineers. And the technological choices made by the Corps and the rest of the federal government have often been poor ones. By now the litany is familiar: the inadequate (but Corps-approved) construction techniques used in the walls of the 17th Street Canal and the London Avenue Canal, whose failure led to the disastrous flooding after Katrina, and the subsequent failure of repairs to the Industrial Canal that let the waters back in after Rita struck; the canals cut by the petrochemical industry that have helped destroy the system of barrier islands and marshes that could have absorbed the storm's impact; the Corps-constructed Mississippi River Gulf Outlet east of the city, which also seriously damaged marshlands; the hubris of building in a flood zone.

Of course, the tragedy of New Orleans is not exclusively, or even primarily, a technological one. Business and politicians did more than acquiesce in decisions to build in unbuildable areas. A political structure fraught with mendacity and a class system tinged with racial antipathy contributed to the magnitude of disaster. Hurricane Katrina occasioned a classic complex systems failure. All the systems necessary to survive and recover from it—the drainage pumps, the first responders, the communications systems, the power grid—ultimately failed, one by one, a pitiful situation aggravated by the late and inadequate response of the national government. But the key event was a technological failure: the collapse of the canal walls.

Now the question is: Can New Orleans be rebuilt as a major city? *Some* city will continue

to exist here at this bend of the Mississippi. The same factor that determined its unlikely location still applies: it sits at a crossroads.

A city *could* be rebuilt with better hurricane protection, more efficient drainage, a building code assuring residents they could safely invest again in homes. New Orleans could also have improved public schools, viable neighborhoods, better opportunities for employment, a vibrant economy. The choice is whether or not that vision will be fulfilled. Those who favor rebuilding tout the importance of the city's river trade, its importance to the petrochemical industry and as an entrepôt for the Mississippi River Valley, its potential as a gateway to Latin America. There is also New Orleans' history as a multiracial city whose gifts to art and music and cuisine and American culture are legendary and invaluable.

As I write, the debate over that great question is ongoing, not only locally but worldwide. Legislators, officials, planners, academics—almost everyone, it seems, in New Orleans and Louisiana and outside, has an opinion on the future of the city. The truth is that the state and the city lack control over New Orleans's fate. Ultimately, the power to choose rests in Washington. Will the federal government decide to invest in the infrastructure that will make the city safe from other hurricanes, other floods, or in the many improvements the city sorely needs?

Whatever the federal government chooses to do, New Orleans will remain—changed, but not deserted. New Orleanians, like the African- Americans of William Faulkner's Yoknapatawpha County, will endure. Some, like me, who could live nowhere else, will still inhabit this place. I hope that the federal government, and the Corps of Engineers, will decide the city is worth not only saving, but improving. Whether they do or not, we will be here.

End Notes

¹ Carolyn Kolb, "Crescent City, Post-Apocalypse" Technology and Culture, January 2006, Vol. 47, 108-111.

Appendix I

Population Tables

These figures are from the following source, except where noted:
<http://www.census.gov/population/www/documentation/twps0027.html>

Campbell Gibson , **POPULATION OF THE 100 LARGEST CITIES AND OTHER URBAN PLACES IN THE UNITED STATES: 1790 TO 1990**, Population Division Working Paper No. 27, Population Division, U.S. Bureau of the Census, Washington, D.C., June 1998

Population of the Largest Urban Places 1790		
1	New York city, NY	33,131
2	Philadelphia city, PA	28,522
3	Boston town, MA	18,320
4	Charleston city, SC	16,359
5	Baltimore town, MD	13,503
6	Northern Liberties township, PA	9,913
7	Salem town, MA	7,921
8	Newport town, RI	6,716
9	Providence town, RI	6,380
10	Marblehead town, MA	5,661
11	Southwark district, PA	5,661
12	Gloucester town, MA	5,317
13	NEW ORLEANS town (1785)*	5,028
14	Newburyport town, MA	4,837
15	Portsmouth town, NH	4,720

* American State Papers, Miscellaneous, I , 381-384

Walter Lowrie, Secretary of State, ed., American State Papers: Documents, Legislative and Executive, of the Congress of the United States from the First Session of the First to the Second Session of the Tenth Congress, Inclusive: Commencing March 3, 1789, and Ending March 2, 1809.

Washington: Gales and Seaton, 1834. 381-382

Population of the Largest Urban Places 1800		
1	New York city, NY	60,515
2	Philadelphia city, PA	41,220
3	Baltimore city, MD	26,514
4	Boston town, MA	24,937
5	Charleston city, SC	18,824
6	New Orleans County (1806)*	17,001
7	Northern Liberties township, PA	10,718
8	Southwark district, PA	9,621
9	Salem town, MA	9,457
10	Providence town, RI	7,614
11	Norfolk borough, VA	6,926
12	Newport town, RI	6,739
13	Newburyport town, MA	5,946
14	Richmond city, VA	5,737
15	Nantucket town, MA	5,617

* Clarence Edward Carter, Ed., The Territorial Papers of the United States, years 1803-1812, Volume I, Washington: Government Printing Office, 1940. p 702. p 923

Population of the Largest Urban Places 1810		
1	New York city, NY	96,373
2	Philadelphia city, PA	53,722
3	Baltimore city, MD	46,555
4	Boston town, MA	33,787
5	Charleston city, SC	24,711
6	Northern Liberties district, PA	19,874
7	New Orleans city, LA	17,242
8	Southwark district, PA	13,707
9	Salem town, MA	12,613
10	Albany city, NY	10,762
11	Providence town, RI	10,071
12	Richmond city, VA	9,735

13	Norfolk borough, VA	9,193
14	Washington city, DC	8,208
15	Newport town, RI	7,907
Population of the Largest Urban Places 1820		
1	New York city, NY	123,706
2	Philadelphia city, PA	63,802
3	Baltimore city, MD	62,738
4	Boston town, MA	43,298
5	New Orleans city, LA	27,176
6	Charleston city, SC	24,780
7	Northern Liberties district, PA	19,678
8	Southwark district, PA	14,713
9	Washington city, DC	13,247
10	Salem town, MA	12,731
11	Albany city, NY.....	12,630
12	Richmond city, VA	12,067
13	Providence town, RI	11,767
14	Cincinnati city, OH	9,642
15	Portland town, ME	8,581
Population of the Largest Urban Places 1830		
1	New York city, NY .	202,589
2	Baltimore city, MD	80,620
3	Philadelphia city, PA	80,462
4	Boston city, MA	61,392
5	New Orleans city, LA	46,082
6	Charleston city, SC	30,289
7	Northern Liberties district, PA	28,872
8	Cincinnati city, OH	24,831
9	Albany city, NY	24,209
10	Southwark district, PA	20,581
11	Washington city, DC	18,826
12	Providence town, RI	16,833

13	Richmond city, VA	16,060
14	Salem town, MA	13,895
15	Kensington district, PA.	13,394

Population of the Largest Urban Places 1840		
1	New York city, NY	312,710
2	Baltimore city, MD	102,313
3	New Orleans city, LA	102,193
4	Philadelphia city, PA	93,665
5	Boston city, MA	93,383
6	Cincinnati city, OH	46,338
7	Brooklyn city, NY	36,233
8	Northern Liberties district, PA	34,474
9	Albany city, NY	33,721
10	Charleston city, SC	29,261
11	Spring Garden district, PA	27,849
12	Southwark district, PA	27,548
13	Washington city, DC	23,364
14	Providence city, RI	23,171
15	Kensington district, PA	22,314
Population of the Largest Urban Places 1850		
1	New York city, NY	515,547
2	Baltimore city, MD	169,054
3	Boston city, MA	136,881
4	Philadelphia city, PA	121,376
5	New Orleans city, LA	116,375
6	Cincinnati city, OH	115,435
7	Brooklyn city, NY	96,838
8	St. Louis city, MO	77,860
9	Spring Garden district, PA	58,894
10	Albany city, NY	50,763
11	Northern Liberties district, PA	47,223

12	Kensington district, PA *	46,774
13	Pittsburgh city, PA *	46,601
14	Louisville city, KY	43,194
15	Charleston city, SC	42,985

Population of the Largest Urban Places 1860		
1	New York city, NY *	813,669
2	Philadelphia city, PA *	565,529
3	Brooklyn city, NY *	266,661
4	Baltimore city, MD	212,418
5	Boston city, MA *	177,840
6	New Orleans city, LA *	168,675
7	Cincinnati city, OH	161,044
8	St. Louis city, MO	160,773
9	Chicago city, IL	112,172
10	Buffalo city, NY	81,129
11	Newark city, NJ	71,941
12	Louisville city, KY	68,033
13	Albany city, NY	62,367
14	Washington city, DC *	61,122
15	San Francisco city, CA	56,802
Population of the Largest Urban Places 1870		
1	New York city, NY *	942,292
2	Philadelphia city, PA	674,022
3	Brooklyn city, NY *	396,099
4	St. Louis city, MO	310,864
5	Chicago city, IL	298,977
6	Baltimore city, MD	267,354
7	Boston city, MA *	250,526
8	Cincinnati city, OH	216,239
9	New Orleans city, LA	191,418
10	San Francisco city, CA	149,473

11	Buffalo city, NY	117,714
12	Washington city, DC *	109,199
13	Newark city, NJ	105,059
14	Louisville city, KY	100,753
15	Cleveland city, OH	92,829

Population of the Largest Urban Places 1880		
1	New York city, NY *	1,206,299
2	Philadelphia city, PA	847,170
3	Brooklyn city, NY *	566,663
4	Chicago city, IL	503,185
5	Boston city, MA *	362,839
6	St. Louis city, MO	350,518
7	Baltimore city, MD	332,313
8	Cincinnati city, OH	255,139
9	San Francisco city, CA	233,959
10	New Orleans city, LA	216,090
11	Cleveland city, OH	160,146
12	Pittsburgh city, PA *	156,389
13	Buffalo city, NY	155,134
14	Washington city, DC *	147,293
15	Newark city, NJ	136,508
Population of the Largest Urban Places 1890		
1	New York city, NY	1,515,301
2	Chicago city, IL	1,099,850
3	Philadelphia city, PA	1,046,964
4	Brooklyn city, NY *	806,343
5	St. Louis city, MO	451,770
6	Boston city, MA	448,477
7	Baltimore city, MD	434,439
8	San Francisco city, CA	298,997
9	Cincinnati city, OH	296,908

10	Cleveland city, OH	261,353
11	Buffalo city, NY	255,664
12	New Orleans city, LA	242,039
13	Pittsburgh city, PA *	238,617
14	Washington city, DC *	230,392
15	Detroit city, MI	205,876

Population of the Largest Urban Places: 1900		
1	New York city, NY *	3,437,202
2	Chicago city, IL	1,698,575
3	Philadelphia city, PA	1,293,697
4	St. Louis city, MO	575,238
5	Boston city, MA	560,892
6	Baltimore city, MD	508,957
7	Cleveland city, OH	381,768
8	Buffalo city, NY	352,387
9	San Francisco city, CA	342,782
10	Cincinnati city, OH	325,902
11	Pittsburgh city, PA *	321,616
12	New Orleans city, LA	287,104
13	Detroit city, MI	285,704
14	Milwaukee city, WI	285,315
15	Washington city, DC	278,718
Population of the Largest Urban Places: 1910		
1	New York city, NY *	4,766,883
2	Chicago city, IL	2,185,283
3	Philadelphia city, PA	1,549,008
4	St. Louis city, MO	687,029
5	Boston city, MA	670,585
6	Cleveland city, OH	560,663
7	Baltimore city, MD	558,485
8	Pittsburgh city, PA *	533,905

9	Detroit city, MI	465,766
10	Buffalo city, NY	423,715
11	San Francisco city, CA	416,912
12	Milwaukee city, WI	373,857
13	Cincinnati city, OH	363,591
14	Newark city, NJ	347,469
15	New Orleans city, LA	339,075

Appendix II

Mortality Rates of Cities

Frederick L. Hoffman, "The General Death Rate of Large American Cities, 1871-1904,"
Publications of the American Statistical Association, Vol. 10, No. 73 (Mar., 1906), 1-29

Cities	1871	1880	1890	1900
Baltimore	24.7	22.1	21.8	18.9
Boston	22.8	23.5	22.7	20.8
New Orleans (total)	30.4	26	29.9	25.9
New Orleans (white)	26.5	23	26	20.7
New Orleans (non-white)	41.4	34.4	40.7	39.7
New York	27.9	26.5	26.5	21.1
Philadelphia	23.4	21.2	21.3	18.9
Northern/Western cities	23.7	22	21.5	17.7
Southern cities (total)	29	24.8	24.3	21.4
Southern cities (white)	26.7	21.5	21.4	18.2
Southern cities (non-white)	38.1	34.8	33.9	31.3

The death rates (deaths per thousand population) in this chart are for cities over 100,000 population, with reports from 34 cities included and not all cities reporting for all years in the original data, which included figures on each year from 1871 to 1904.

For Southern cities, population totals for 1871 were (white) 357,071 with deaths of 9,533; and (non-white) population of 91,918 with deaths of 3,505. The combined population for 1871 was 448,989 with total deaths of 13,038, for a combined death rate of 29. Population totals for 1880 were (white) 573,772 with deaths of 12,364; and (non-white) population of 185,825 with total deaths of 6,459, for a combined population of 759,597 with total deaths of 18,823 for a combined death rate of 24.8. Population totals for 1890 were (white) 867,673 with deaths of 18,539; and (non-white) population of 264,524 with deaths of 8,966, for a combined population of 1,132,197 with deaths of 27,505 for a combined death rate of 24.3. Population totals for 1900 were (white) 1,047,666 with deaths of 19,038; and (non-white) population of 333,764 with deaths of 10,461, for a combined population of 1,381,430 with deaths of 29,499 and a combined death rate of 21.4.

For New Orleans, population totals for 1871 were (white) 142,623 with deaths of 3,781; and (non-white) population of 51,130, with deaths of 2,115, for a combined population of 193,753 with deaths of 5,896 and a combined death rate of 30.4. Population totals for 1880 were (white) 158,473 with deaths of 3,637; and a population total (non-white) of 57,723 with deaths of 1,986, for a combined population of 216,196 with combined deaths of 5,623 for a death rate of 26. Population totals for 1890 were (white) 177,376 with deaths of 4,605; and population (non-

white) of 64,663 with deaths of 2,633, for a combined population of 242,039 and combined deaths of 7,238 for a death rate of 29.9. For 1900, the population total (white) was 208,946 with deaths of 4,318; and the population total (non-white) was 78,158 with deaths of 3,106; for a combined population of 287,104 with combined deaths of 7,424 for a death rate of 25.9.

Joseph Jones, M.D. “Table C, Mortuary Statistics of New Orleans, Louisiana, United States of America, During a Period of 34 Years, 1844-1880, Consolidated From Original Reports and Records” Medical and Surgical Memoirs: Containing Investigations on the Geographical Distribution, Causes, Nature, Relations and Treatment of Various Diseases, 1855-1886. Vol. 3, (New Orleans: Joseph Jones, 1890)

	1844	1850	1853	1860	1870	1878	1880
New Orleans (Jones)	51.7	59	99.2	43.5	36.2	48.8	26

Variations in a city’s mortality data from year to year could be large in the nineteenth century. Epidemic disease could sweep through as the death rate would rise, as it did in New Orleans for yellow fever epidemics in 1853 (when 99.2 people per thousand in the city died) and 1878 (48.8 per thousand.)

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