FIGURE 1. Reconstructing St. Anthony Falls. Artist: Peter Gui Clausen, 1869. Minnesota Historical Society.

Chapter 6

St. Anthony Falls: Timber, Flour and Electricity

No place anchors the MNRRA corridor's significance like St. Anthony Falls. No place in the corridor can match its regional, national, even international significance. Geologically, it is unique. St. Anthony Falls is the only major falls on the upper Mississippi River. Historically, its visitors and commentators comprise a who's who of European and American exploration: Father Louis Hennepin, Jonathan Carver, and Zebulon Pike, to name a few. Economically, it created a city with no peer west of Chicago to the Rock Mountains and south to St. Louis. It gave birth to the saw milling and flour milling industries that became the leading producers of their commodities in the United States and the world. Minneapolis would be the nation's flour capital for 50 years. Technologically, the falls produced the first commercial hydroelectric central plant in the country. The St. Anthony Falls area boasts two National Historic Landmarks – the Pillsbury A Mill and the Washburn A Mill – and, the Great Northern Railway Bridge, a National Engineering Landmark. For these reasons, St. Anthony Falls merits a special look. *(Figure 1.)*

Geology

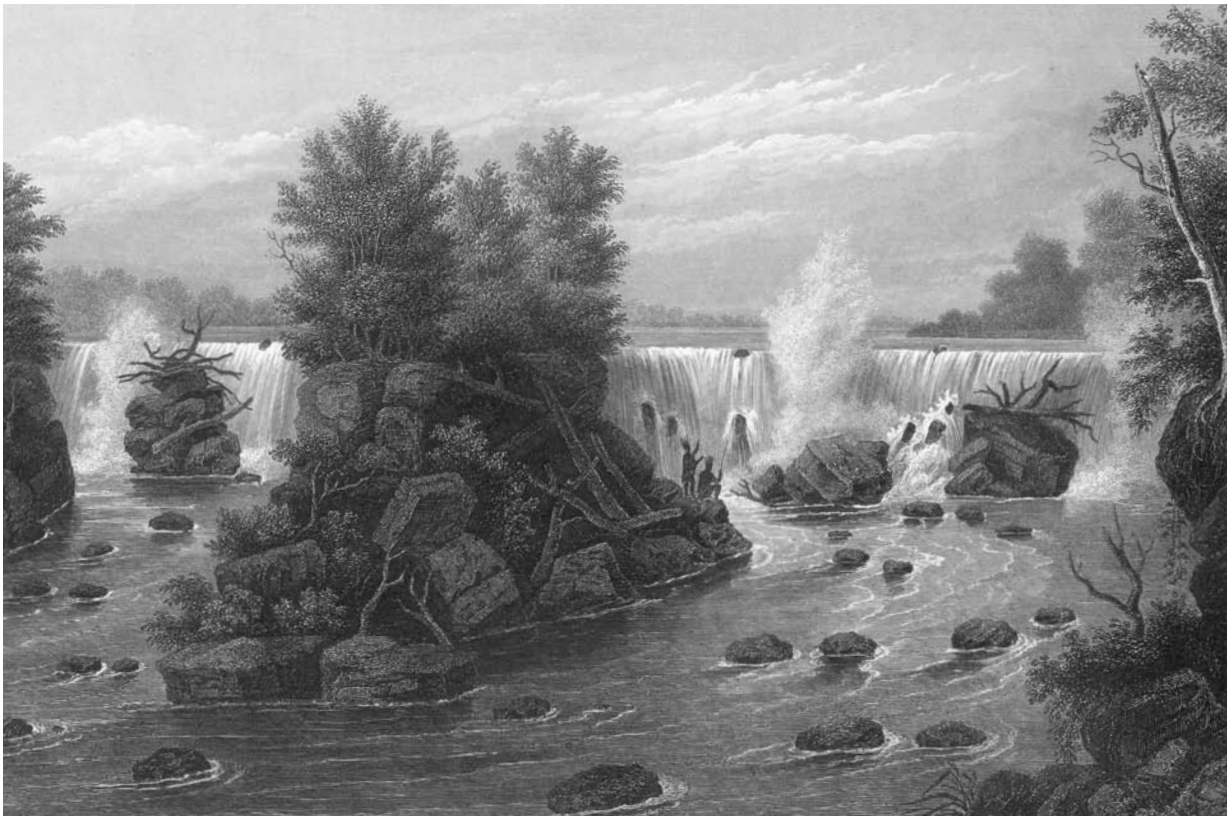
Millers at St. Anthony Falls thought themselves blessed by the Mississippi River's geology. As detailed in Chapter 1, the riverbed above the falls is made of a thick mantle of hard Platteville limestone. The limestone covers a veneer of shale and mixed sandstone. Beneath these lies a deep deposit of soft St. Peter sandstone. Millers drove shafts through the limestone and shale and then easily excavated their tailraces to the toe of the falls. What they considered a blessing, however, they almost destroyed.

The same geology admired by the millers allowed the falls to retreat upriver. Imagine standing on the bluffs overlooking the Mississippi valley near downtown St. Paul about 12,000 years ago. You would be drenched by the spray and deafened by the roar of an immense waterfall. It measured some 2,700 feet across and stood 175 feet high. The meltwaters from the colossal glacial Lake Agassiz, lying in northwestern Minnesota and in southern Canada, thundered over it. As the water boiled back at the soft sandstone, it undermined the limestone riverbed. Soon, the unsupported limestone broke off, and the falls receded upstream, and the process began again. By 1680, when Father Hennepin became the first European to see the falls, it lay roughly 1,500 feet downstream from its present location.

Native American History

We know little about the Native Americans' relationship to the falls over the last 12,000 years. *(Figure 2.)* Few artifacts telling of their presence have been found. Some fluted points (Clovis and Folsom) and unfluted lanceolate spear

FIGURE 2. Owahmenah ("falling water"), one of at least several Dakota names given to the falls that Father Louis Hennepin would rename St. Anthony. Lithograph. Hermann J. Meyer. St. Paul District, Corps of Engineers.



points (Plano) found along the river demonstrate that Native Americans visited the corridor as early as the Paleo-Indian era *(see Chapter 2)*. Where they viewed the falls from or where they might have portaged around it probably changed from decade to decade, and, at times, from year to year, as the falls retreated. The potential for archeological sites associated with the falls, therefore, exists along the entire route of its migration.[1]

When Europeans arrived, the Dakota commanded the area, although the Chippewa ventured down the Mississippi to attack the Dakota. From Hennepin's 1680 account, we know the Dakota used the Mississippi as a route for hunting and warfare. While the Chippewa occupied the Headwaters area by the late eighteenth century and early nineteenth century, the Dakota remained dominant around the falls.[2] George Catlin, who visited the cataract in 1835, depicts the Chippewa portaging around it. The Chippewa had visited Fort Snelling.

Native Americans probably had many names for the falls, names describing its character. We know the Chippewa used Kakabikah (the severed rock) and Kichi-Kakabika (the great severed rock) for the fractured limestone blocks that littered the area below the falls. The Dakota called the falls Minirara (curling water), O-Wa-Mni (whirlpool), Owahmenah (falling water), and HaHa Tanka (big waterfall).[3]

Although the details are sketchy and Hennepin's account is suspect, we know the falls possessed energy, spirituality and history for the Dakota. In 1680, as his party was portaging around the falls, Hennepin saw a Dakota man who had climbed an oak tree near the falls and was "weep-

ing bitterly. . . ." The man was praying to Oanktehi, who resided below the falls and was, according to Hennepin, the spirit of waters and evil. Hennepin writes that the man "had a beaver robe dressed neatly, whitened inside, and decorated with porcupine quills, and was offering it in sacrifice to this cataract, which is terrifying and admirable." During his prayer, the man pleaded: "'You, who are a spirit, grant that our tribe pass by here tranquilly without mishap. Grant that we may kill many buffaloes, destroy our enemies, and bring here captives, some of whom we will sacrifice to you.'"[4]

In the 1817 account of his expedition, Major Stephen Long tells the story of Dark Day or Ampato Sapa, a Dakota woman who killed herself and her two children after her husband took a second wife. Her husband watching, she plunged over the falls in a canoe with their children. Her spirit was said to haunt the falls and Spirit Island.[5] We cannot know what aspects of these accounts are fact, what the Dakota really told early explorers, or why they told it to them. But the legends indicate that the falls undoubtedly possessed many stories and traditions for the Dakota.

The falls also served as a source of a special clay. During his 1820 expedition, Henry Rowe Schoolcraft observed that the Dakota collected a "brownish red" clay from "close under the sheet of the principal column of water, . . ." They used the clay to paint their baskets and canoes. Schoolcraft described the clay as being "an aluminous substance very much mixed with iron pyrites in a state of decomposition, and penetrated with vegetable juices." From Schoolcraft's account, it is not clear whether the Dakota mixed vegetable juices with the clay or if the clay appeared this way naturally. The Dakota, he judgementally wrote, "pretend that it is renewed when taken away."[6] The Dakota, of course, were not pretending; they believed that some spirit at the falls supplied the clay. How many stories, legends, traditions, ceremonies and spirits the Dakota, Chippewa or other Native American Indians had for the falls, we cannot begin to guess.

Some Dakota bands lived around the falls or not too far away when the early explorers and settlers arrived. Cloud Man had a village (Eatonville) at Lake Calhoun and occasionally camped at the falls in the summer. Good Road's band of about 10 tipis sometimes stayed near what is now downtown Minneapolis. We also know that the Dakota tapped the sugar maples on Nicollet Island.[7] Kaposia, both the old and the new (1830s-1854), lay downriver near Daytons Bluff.

Chaotic Majesty

Seeing St. Anthony Falls today, it is hard to imagine what it looked like in its natural state. The locks and dams, the concrete spillway, the two overflow spillways, the bridges, the buildings, the power lines and poles, and the miscellaneous clutter obscure what the falls was like, challenging our ability to imagine its pristine character. Water sliding over the spillway or slipping through turbines bears no resemblance to the way water broke raucously over the fractured limestone long ago. Fortunately, European and American explorers, government officials and early tourists left descriptions of the natural falls. To them, it was a geologic marvel and a geographic anchor. The accounts they penned are important not just for what they tell about the falls. The people themselves were important figures participating in the process of exploration, trade, and settlement. *(Figure 3.)*

Most early visitors felt a need to compare St. Anthony to Niagara and other falls, weighing St. Anthony's quality and importance by standards that did not fit. In 1680 Hennepin estimated the falls plunged 40 to 60 feet. Twenty years later, Jean Penicaut, the second explorer to leave a description, agreed with the higher figure. Both exaggerated. In 1766 Carver judged the height to be about 29 feet. Cutting its stature even more, Zebulon Pike calculated that the falls dropped only 16½ feet. While the cataract had migrated upstream between visits, this cannot account for the gap between Hennepin's and Pike's numbers.

More than likely Hennepin and Penicaut exaggerated and miscalculated. Carver and others suggest a reason. Carver explained that the rapids below the falls "'render the

descent considerably greater, so that when viewed at a distance, they appear much higher than they really are. . . .'"[8] In 1817 Long expanded on this observation. He figured the vertical fall at 16½ feet, but, he reported, the rapids began several hundred yards above the falls and continued for eight miles below. Relying on Pike's estimate, he noted that from the beginning of the rapids to about 4,030 feet down to the "portage road" the river fell about 58 feet. With this estimate, the total drop from the beginning to the end of the rapids approached 75 feet.[9] If Hennepin and others included part of the rapids in their estimates, they may not have been so far off.

FIGURE 3. St. Anthony Falls' last days. Although dated 1853, this engraving by Seth Eastman does not show the dam built by Franklin Steele in 1848 that ran from the east bank to Nicollet Island. The west side dam would be completed in 1857. The saw and grist mills built by soldiers from Ft. Snelling in the early 1820s are visible at the left. Artist: Seth Eastman. Engraving courtesy of David Wiggins.

St. Anthony Falls disappointed those who compared it to other cataracts. Hennepin began the comparison game, remarking that the height of St. Anthony "'doth not come near that of Niagara.'"[10] Pike, having read earlier descriptions and seeing the falls at low water, was unimpressed when he passed going upstream.[11] Even more critical, painter and explorer George Catlin derided the falls as "'pygmy in size to Niagra.'"[12] While some left disappointed, most departed with respect, admiration and praise.

St. Anthony Falls did not need a great plunge to make it impressive. Its unique geology provided the rough canvas over which the water flowed to create an image most found captivating. Sharp and jagged, St. Anthony's leading edge dispersed the Mississippi into a myriad of falls over which the water sometimes dropped in clear sheets. The jumble of limestone slabs that had toppled from the falls kicked the water in all directions. The forested islands–Nicollet, Hennepin, Spirit, Upton, and Cataract–divided the river, adding to the complex flow of water in, around, over and

down from the falls. All these features combined to offer a spectacle that overwhelmed most, if not all, visitors. Even if Hennepin thought St. Anthony small compared to Niagara, he found that the water pouring over the falls was "'terrible, and hath something in it very astonishing.'" And Carver, despite estimating the falls to be 20 to 30 feet shorter than Hennepin, remarked that ". . . I was greatly pleased and surprised, when I approached this astonishing work of nature. . . ." He raved that "'a more pleasing and picturesque view cannot, I believe, be found throughout the universe.'"[13]

Carver further expands our image of the falls. Two small islands, he wrote, lay below the falls. One was Spirit Island. About an acre in size, it possessed "several oak [cedar] trees on which are a vast many eagles' nests." The reason for the eagles' nests, he explained, was "the great numbers of fish that is killd [sic] in attempting to get up and down the falls." Eagles swooping through the mists of St. Anthony to clutch fish trying to migrate above the falls may be hard for people to imagine since migrating fish can no longer get above Lock and Dam No. 1 and some of the other dams below. Even Pike changed his mind about the falls. When he returned down the Mississippi River at high water, he wrote, "'the appearance is much more sublime, as the great quantity of spray which in clear weather reflects from some positions the colors of the rainbow, and when the sky is overcast, covers the falls in gloom and chaotic majesty.'"[14]

Visiting the falls in 1820, Henry R. Schoolcraft also thought St. Anthony less awesome than Niagara. Still, he found it possessed a unique beauty. It had, he observed, "a simplicity of character which is very pleasing." Employing the language of his day to characterize a landscape, he commented: "We see nothing in the view which may not be considered either rude or picturesque, and perhaps there are few scenes in the natural topography of our country, where these features are blended with more harmony and effect."[15] The landscape's transition around the falls also struck Schoolcraft. Above the falls, he observed, the prairie came up to the river.[16] Below the falls the river fell into the gorge that would characterize its path down to Fort Snelling, before entering the valley through which it coursed for hundreds of miles.

Picturesque landscapes exuded a rough and irregular character. By their scale, sublime landscapes evoked a sense of danger or astonishment. St. Anthony provided both.[17] Lt. James E. Colhoun captured the sense of astonishment, scale, and roughness presented by the falls. A member of Stephen Long's second expedition, he visited the falls in July 1823. ". . . I confess," Colhoun admitted, "I was at first disappointed from the difficulty of embracing the whole at once. I thought the islands and the piles of rocks in front rather caused unpleasant obstruction of the view than lent savage grandeur to the scene. But they possess a peculiarity; the sheet of water, furnishing every variety of cataract in shape and shade, continues unrent, though alternately salient and retiring, sometimes many feet." Revealing how shallow the river could be, Colhoun waded across it a few yards above the falls. While the river was never above his thigh, he admitted the current would have carried him over the falls had he slipped.[18]

Giacomo Beltrami, an Italian romantic and traveler who accompanied Long's 1823 expedition, waxed more eloquent. Writing to his wife, he gushed, "What a new scene presents itself to my eyes, my dear Madam! How shall I bring it before you without the aid of either painting or poetry?"[19] Resting on a knoll about one-half mile from the falls he, nevertheless, tried.

> *. . . I see, . . . two great masses of water unite at the foot of an island which they encircle, and whose majestic trees deck them with the loveliest hues, in which all the magic play of light and shade are reflected on their brilliant surface. From this point they rush down a rapid descent about two hundred feet long, and, breaking against the scattered rocks which obstruct their passage, they spray up and dash together in a thousand varied forms. They then fall into a traverse basin, in the form of a cradle, and are urged upwards by the force of gravitation against the side of a precipice, which seems to stop them a moment only to encrease their violence with*

> *which fling themselves down a depth of twenty feet. The rocks against which these great volumes of water dash, throw them back in white foam and glittering spray; then, plunging into the cavities which this mighty fall as hollowed, they rush forth again in tumultuous waves, and once more break against a great mass of sandstone forming a little island in the midst of their bed, on which two thick maples spread their shady branches.*[20]

Adding to the aura of St. Anthony Falls was the sound created by water breaking over the falls and bursting through the jumbled limestone boulders. In 1700 Penicaut said the falls roared like "'thunder rolling in the air.'"[21] Carver claimed he could hear the falls from 15 miles away.[22] More astonishing, George W. Featherstonhaugh, a British-born geologist who visited the falls in 1835, insisted he heard the falls from almost 30 miles away.[23] On the evening of September 10, while making camp not far above the mouth of the St. Croix River, he reported hearing a "deep throbbing sound coming at intervals from a great distance, . . ." Asking his men about it, they told him it came from St. Anthony Falls.[24] ". . . I retired to my tent rather late," Featherstonhaugh confided to his journal, "listening to the throbbing sound of the cataract until I fell asleep."[25] While such accounts seem absurd, people clearly heard the falls from far away. With all the noise in our world today, it is hard to imagine the quiet of the surrounding area or the force of the falling water that would have allowed anyone to hear the falls from such a distance. Up close, the noise must have been deafening.

Sound came not only from the falls. On the evening of July 17, 1817, Long stayed just below the cataract. "The place we camped last night," he wrote, "needed no embellishments to render it romantic in the highest degree." The bluffs, he estimated, rose about 100 feet high and were covered with vegetation. "A few yards below us," he continued, "was a beautiful cascade of fine spring water, pouring down from a projecting precipice about one hundred feet high."[26] The river rushed by and St. Anthony was visible upstream. Together, he exclaimed, "The murmuring of the cascade, the roaring of the river, and the thunder of the cataract, all contributed to make the scene the most interesting and magnificent of any I ever before witnessed."[27]

French scientist, Joseph N. Nicollet visited the falls in 1838 and put many of the elements together. To him, "with the noisy boiling of its waters, rebounding in jets from the accumulated debris at its foot, its ascending vapors, and the long and verdant island that separates the two portions of the falls with the solitary rocky island that stands in front altogether," the falls created "a grand and imposing spectacle . . . ."[28] Having led government expeditions on the Mississippi and Missouri Rivers to map their watersheds, Nicollet had seen plenty of rivers.

The descriptions of St. Anthony's natural character expanded following the visits of these explorers and travelers. Their writings and the advent of steamboat navigation on the upper Mississippi River in 1823 gave rise to the "fashionable tour," as wealthy easterners ventured to see the river and the falls. Writers, artists, and tourists also journeyed to the falls and left their visual and written accounts, adding to and embellishing upon St. Anthony's grandeur, a grandeur that would soon disappear.

Working the Falls

The increasing numbers of settlers and squatters around Fort Snelling may have appreciated St. Anthony's beauty, but they anxiously waited to capture the energy and the economic promise it offered. As early as 1819, Lt. Colonel Henry Leavenworth recognized the falls' hydropower potential. To support the fort's construction and operation, Leavenworth suggested building saw and grist mills at St. Anthony. His successor, Colonel Josiah Snelling, built the mills and two barracks on the west bank between 1821 and 1823. The mills presaged the future of St. Anthony, for much of its fame would come from the milling of timber and flour. These commodities, along with hydroelectric power, would largely define the falls' legacy and physical character.

Other than Fort Snelling's mills and associated buildings, the falls remained largely natural until 1847. Small changes had taken place around the mills. By 1833 soldiers had built a farmhouse and stables and grazed some 200 head of cattle nearby. But private development at St. Anthony was not yet possible, since the land around the falls lay inside Fort Snelling's military reservation. The Pike cession extended for nine miles along both sides of the Mississippi River above the fort. Nevertheless, 157 squatters had settled on the reservation by October 1837. Based on the frontier tradition of preemption, the squatters hoped to get first choice to lands within the reservation. Under preemption, settlers who had established a claim on the land prior to its official sale had the first opportunity to purchase the land they occupied. Living on land next to the falls could give a squatter the rights to the hydropower based on another tradition, that of riparian rights, which held that the person occupying the land next to a body of water had the right to the water passing by their land.[29]

In 1837 the territorial governor negotiated treaties with the Dakota and Chippewa that excited the squatters. Ratified in 1838, the treaties gave the U.S. government title to the land between the St. Croix and Mississippi Rivers. This should have excluded the land within the Pike cession, but just prior to the treaties, Joseph Plympton, Fort Snelling's commandant, had undertaken the first detailed survey of the fort's boundary. Hoping to establish his preemption rights over all others, Plympton deliberately excluded the falls' eastern shore from the military reservation (although the Pike cession had clearly included it). This opened the eastern shore to settlement, once the United States had acquired title to it from the Dakota. The 1837 treaty provided the title.[30]

News that treaties had been ratified arrived on July 15, 1838, with the steamboat *Palmyra*. Commandant Plympton only had to stake his claim next to St. Anthony to complete his plan. But, during the middle of the night, a young entrepreneur named Franklin Steele beat him to the site. When the commandant's men arrived the next morning, Steele was already entrenched *(Figure 4)*.

Born in Pennsylvania, the 25-year old Steele was a storekeeper at Fort Snelling and part owner of the St. Croix Falls Lumber Company. He would become the founder of the milling industry at St. Anthony. Since the east side (the town of St. Anthony) would become part of Minneapolis, he

FIGURE 4. Franklin Steele, the founder of commercial timber milling at St. Anthony Falls. Kane, **The Falls of St. Anthony.**

can be considered a contributing founder of that city as well. Other squatters quickly established their claims to the lands east of the river. The west side, however, would not become available officially until 1856.[31]

Timber • As of 1838, Steele had most of what he needed to put St. Anthony Falls' tremendous power to work. In timber he had a natural resource sufficient to ensure the falls' energy would be fully employed, at least for as long as he could imagine. From St. Anthony to the Mississippi's headwaters and beyond, conifers and hardwoods shaded 70 percent of

what would become Minnesota. The Mississippi and its tributaries provided the transportation routes needed to deliver the raw material to the power source and to ship the finished products to local, regional and national markets. But Steele still needed two important elements: official title to the land and capital. For these, Steele would have to wait nine years, until 1847, before he could begin to realize his ambitions.[32]

Steele might have begun milling sooner if he could have found the money, but the money was tied to the title. When Steele met with the representative of two potential eastern financiers, the representative questioned the security of Steele's preemption claim. The 1837 Dakota treaty gave the United States title, but the United States had not yet put the land up for public sale. What if the government rejected Steele's claims and let someone else buy the land? The investors would loose their money. Despite the investors' worries, Steele persuaded them to join his venture in July 1847. First, however, the investors sent a lumber surveyor into Minnesota's pineries to determine how much timber the pineries held and to assess the navigability of the Mississippi and its tributaries for floating logs. The surveyor dispelled the investors' fears, reporting that the timber was "'almost inexhaustible.'" Steele finally got an agreement. The financiers committed $12,000 for a nine-tenths interest in the property. Not until March 1848, however, did Steele receive the funds. On May 8, 1848, President James K. Polk finally declared the first land sales in what would become Minnesota, and Steele officially acquired his claim on September 8, 1848. On part of his land Steele platted the town site of St. Anthony.[33]

Trusting that the money and title would come soon, Steele had begun developing his land, initiating the demise of the natural falls. In July 1847 he built a mess hall, carpentry and blacksmith shops, stables, and a bunkhouse. In October his crews began work on a dam, cutting logs on the Rum River and floating them to a boom at the Rum's mouth. Although the boom broke on November 1 and the logs escaped, Steele's workers cut hardwoods on Nicollet Island and brought timber from the St. Croix mills to complete the dam and sawmill in 1848.[34]

The dam lay a short distance above the falls on the east side. Nicollet and Hennepin Islands divided the river into two channels just above the falls. The dam blocked the east channel, "running from the shore to a point twenty feet above the head of Hennepin Island and then to the foot of Nicollet Island." Secured to the limestone riverbed, the dam extended for some 700 feet and stood 16 feet high. Founded on a base 40 feet wide, it tapered to 12 feet at the top. By the end of 1848, two up-and-down saws operated on the new dam. The millpond upstream held the logs until ready, and a 50-foot-wide platform in front of the mill stored the cut lumber.[35]

Steele's dam and mill heralded the end of an epoch and the beginning of a new era for St. Anthony Falls. During the epoch, which had lasted from the retreat of the glaciers until 1847, natural forces defined the falls' physical appearance, the sounds it made, and the rate and path of its retreat. After 1847 the site and sounds of the natural falls rapidly disappeared, and human actions defined its physical character and the rate of its retreat. New sounds reached visitors approaching the falls. The dam also heralded a new era for the new territory's forests and prairies, as the timber milling spurred the clear-cutting of Minnesota's forests and as flour milling would soon fuel the plowing of the prairies and the planting of countless wheat fields.

Steele sent logging crews into the north woods near the mouth of the Crow Wing River on December 1, 1847, to fell logs for the mill. His representatives negotiated with Chief Hole-in-the-Day of the Chippewa for permission to cut the timber. The chief agreed, for the price of 50 cents per tree. By March, Steele's men had sawed some 1.5 million board feet of timber. That spring and many springs after, logs bobbed downriver to the mills at St. Anthony to feed the booming need for houses and commercial buildings. This first season, however, the mill did not begin cutting until September 1, 1848. Steele sold the lumber as fast as he sawed it.[36]

From 1849 to 1852 the number of sawmills increased from one to four, and daily production grew from 15,000 board feet to 50,000. By 1855 the daily output had jumped to 100,000 board feet and the yearly output to 12,000,000. Much of the lumber floated downstream to St. Louis, although the burgeoning communities at the falls and at St. Paul demanded more and more.[37]

Steele's success intensified interest in the falls' west side. Would-be lumber barons gazed over the river, knowing that whoever grabbed the land on the west would control half the power. The federal government, however, had refused to lease or sell the old Fort Snelling mills or any land on the west side to private citizens. While Plympton's cartographic license and the 1837 treaties had opened the east to settlement, the west side remained squarely within the Fort Snelling military reservation.

Nevertheless, in 1849, two individuals gained a foothold on the western shore. Robert Smith, an Alton, Illinois, businessman, and a representative in Congress, requested a five-year lease on the Fort Snelling mills and on a house built near them. His plan, he claimed, was to live in the house and grind flour for local use. Fort Snelling's commandant complained that Smith was conniving to gain control of milling on the west side. Although the War Department had denied others, Smith secured the lease. Smith was not a complete outsider. He had purchased land in St. Paul, and some thought he should be Minnesota's first territorial governor.[38]

Later in 1849 Franklin Steele suggested to John H. Stevens, a friend, that Stevens request 160 acres above Smith. Steele's idea was that Stevens propose to ferry troops and supplies for the newly built Fort Ripley in northern Minnesota in exchange. The ploy worked, and during the winter of 1849 to 1850, Stevens built the first permanent home in what would become Minneapolis.[39]

Then, in the summer of 1851, the government negotiated the Treaties of Traverse des Sioux with the Sissetons and Wahpetons and the Treaty of Mendota with the Mdewakantons and Wahpekutes, under which the Dakota ceded nearly all their lands in Minnesota.[40] In 1852 Congress passed a bill removing 26,023 acres from the 34,000-acre military reserve, including the area around St. Anthony Falls. While these actions did not officially open the west side to settlement, they were enough to encourage a rush by squatters. By 1854 some 300 squatters inhabited the west side. Finally in 1855, Congress amended the 1852 Act that removed land from the military reserve and recognized the squatters' preemption rights. Squatters living on the west side could now buy the land they claimed. New settlers hurried across the river, and beginning in 1855, the government started selling the land. By 1856 the west side's population had jumped to 1,555.[41]

In 1856 the west and east side interests formed consolidated companies to manage their power and obtained perpetual charters from the Minnesota territorial legislature. Smith, joined by 11 others who had staked claims to the west side waterpower, formed the Minneapolis Mill Company. The following year, Dorilus Morrison, one of the most important partners, convinced his cousin Cadwallader C. (or C. C.) Washburn, from Maine, to join the company, and C. C. then persuaded his brother William D. Washburn to join the firm in 1857. By 1865 the Washburns, Morrison and Smith owned the company outright. Morrison and the two Washburns would build St. Anthony into the nation's leading milling center, but their interests went beyond milling. Morrison would serve as Mayor of Minneapolis in 1867 and become a state senator. C. C. Washburn (who left Maine in 1839, moved to Iowa, Illinois, and finally Wisconsin) made La Crosse his permanent home after 1861. Wisconsin elected him to Congress and as their governor. William Washburn served in the Minnesota legislature and in Congress.[42] *(Figure 5.)*

Across the river, Steele and his partners created the St. Anthony Falls Water Power Company in 1856. Steele's partners included three New York financiers: John F. A. Sanford, Frederick C. Gebhard, and Thomas E. Davis. In 1868, after years of financial problems, the St. Anthony firm reorganized. The new board and officers included men

whose names would become well known in the history of Minneapolis and the state: John Pillsbury, Richard and Samuel Chute, Sumner Farnham, and Frederick Butterfield.[43]

In 1856, with the Minneapolis Mill Company ready to develop the west side, the two companies had to divide the water. Consequently, the Minneapolis Mill Company built a dam out into the river and then angled it to a point upstream to meet the dam constructed by the St. Anthony Company. Together the dams created an inverted V in the river that directed water to the mills on either side. This left the center of the falls dry and exposed during low water and contributed to the deterioration of the central falls. Finished in 1857, the new dam established the basic shape of the falls upstream of the spillway (nearly the shape it has today). While Steele's dam and mills had begun transforming the east side, the new structure (the first full dam on the river) completed the transformation of the falls, especially once the Minneapolis Mill Company began erecting mills on their new dam.[44]

The dam created the infrastructure needed to capture the falls' power. But Steele's St. Anthony Falls Water Power Company struggled to expand its milling operations. Poor management, difficult relations with its eastern financiers, and bad timing thwarted the company's efforts. The same year the two companies completed the dam, America fell into a depression. In 1861, before the St. Anthony firm could recover, the Civil War began, arresting the company's plans. For years, the company did little to expand its milling capacity. The St. Anthony Company did support the development of mills on Hennepin Island and along the east bank, but it had to use ropes and wheels to transfer power at the falls to these mills and to operations on Nicollet Island. The rope system, however, worked best near the falls.[45]

FIGURE 5. St. Anthony Falls, 1859. Minnesota Historical Society.

On the west side, the Minneapolis Mill Company's unified management and financial stability allowed it to invest its property, despite the depression. The company modeled its operating system after renowned Massachusetts milling centers such as Lowell, Holyoke, and Lawrence. They hired Charles Bigelow, an engineer from Lawrence, to design their system. The plan would expand the company's direct power capability away from the falls. It called for building a central canal to divert water from above the falls to the multiple head races of mills built

along the canal. Construction began on the new system in 1857 and continued despite the economic depression. Workers broke through the limestone cap and removed the soft sandstone for a canal that was 14 feet deep, 50 feet wide, and 215 feet long. The company extended and deepened it in later years. The canal system included turbine or wheel pits, a labyrinth of underground tunnels, head races and tail races, and an open canal. Together the system ran for three miles. By 1869 the west side produced twice as much lumber as the east.[46]

With its canal system, the west side's production and population expanded dramatically before the Civil War. The east side mills, limited to ropes and pulleys, had stagnated. In 1866 or 1867, the St. Anthony Company tried to build a canal system of its own into the east bank. But after digging several hundred feet, workers ran into a large cave. Since constructing a canal through the cave would have cost too much, the St. Anthony Falls Mill Company gave up. The geology that had given birth to the milling industry was holding it back now on the east side.[47]

Based on the Minneapolis Mill Company's success and on the sputtering output from the St. Anthony Company, lumber milling became vital to Minneapolis (which joined with St. Anthony in 1872). Beginning with Steele's 1848 lumber mill, timber commanded production at the falls. The annual output grew from about 12 million board feet in 1856 to about 90 million in 1869. The mills on the east and west rows (the side-by-side mills built on platforms out over the falls) accounted for much of this. Six mills stood on the east side (five on the row and one on Hennepin Island). Between 1858 and 1869, Joel Bassett, Morrison, William D. Washburn and others built eight mills on the west side row, patterned after those in the eastern United States. In all, 18 lumber mills operated at St. Anthony by 1869, with 18 different owners *(Figure 6)*. But in 1869 and 1870, disasters threatened production.[48]

Saving St. Anthony • A scheme developed by William W. Eastman and John L. Merriam to expand milling above the falls caused the first industrial calamity. Eastman and Merriam bought Nicollet Island in 1865, including its waterpower rights. They then accused the millers at the falls of taking their water. To avoid a protracted legal battle, the millers compromised. They agreed to let Eastman and

FIGURE 6. West side platform mills, about 1868. Photo by Jocoby. Minnesota Historical Society.

Merriam build a mill on Nicollet Island and run a tailrace to it from the toe of the falls. On September 7, 1868, the two entrepreneurs began excavating their tailrace. By October 4, 1869, their workers had tunneled through 2,000 feet of sandstone, under the limestone riverbed. The tunnel ran from the edge of the falls, under Hennepin Island, to the toe of Nicollet Island. That morning, the workers discovered water leaking and then pouring into the tunnel's upper end. The water quickly ate away the soft sandstone. Within hours, the six-foot-square tunnel grew into a cavern up to 90 feet wide and 16½ feet deep. The next morning, the limestone riverbed collapsed. A large whirlpool formed,

sucking in everything nearby and spitting it out the tunnel. *(Figure 7.)*

Immediately word spread that the falls was going out. One witness recalled that "proprietors of stores hastened to the falls, taking their clerks with them; bakers deserted their ovens, lumbermen were ordered from the mills, barbers left their customers unshorn; mechanics dropped their tools; lawyers shut up their books or stopped pleading in the courts; physicians abandoned their offices."[49] Responding to the emergency, volunteers built a large raft and floated it over the whirlpool. They piled on dirt, rocks and debris until it sank and plugged the hole, but another whirlpool appeared. The volunteers built more rafts and sank them over the new break. By the afternoon, they inspected their work and celebrated "the triumph of human skill and brain power over the dumb force of nature."

FIGURE 7. Eastman Tunnel collapse, Hennepin Island, 1869. Minnesota Historical Society.

Nature took exception. As people scrambled off, the river devoured the feeble structures. One local newspaper exclaimed that the whirlpool "tossed huge logs as though they were mere whitlings," standing them on end "as if in sport" and swallowed them.[50]

Residents of Minneapolis and St. Anthony and the millers knew they could not stop the falls from eroding. So they turned to the Corps of Engineers, which had established a regional office in St. Paul in August of 1866. The Corps examined the falls in November 1869 but had no money and no clear authority to help. Then, on July 11, 1870, Congress gave the Corps $50,000 to preserve the falls. Without the falls, local citizens had argued, the river above Minneapolis would become a shallow, unnavigable rapids. To save navigation above the falls (and milling), the Corps began working at St. Anthony on August 9, 1870.

For three years the river foiled the efforts of the Corps, the millers, and local citizens. They tried to plug holes and line the tunnel with concrete. But the water kept finding new ways under the limestone, scouring new tunnels and cavities, and the falls continued to erode. After a detailed survey of the river above the falls, the Engineers learned that the limestone cap ended less than 1,000 feet above the cataract. Water was seeping under the cap and eating its way through the sandstone. Unless they stopped this, water would undercut the remaining limestone, and the falls' 12,000-year journey would end. Emphasizing the futility of their efforts, a flood swept through a cofferdam on the west side of Nicollet Island on April 15, 1873, opening a gap 150 feet wide. Water poured into the tunnel, drowning one man and destroying large parts of the repair work.

Recognizing that they could not save the falls by plugging the leaks, the Corps convened a special board of engineers at St. Anthony Falls on April 14, 1874. The board made three recommendations: 1) direct some water to the center of the falls to keep it from drying out; 2) build a new apron to protect the edge of the falls; and, most importantly, 3) build a massive wall under the limestone from one side of the river to the other. Everyone agreed.

On July 9, 1874, the Corps began building the wall. First they excavated a 75-foot-deep vertical shaft on Hennepin Island. Next they dug a horizontal tunnel four feet wide and six feet high just below the limestone. Then workers began digging out a space for the concrete wall. In places, the wall would extend 39 feet below the limestone, which varied from 11 to 25 feet thick. Above the limestone lay the sand and the muck and the river. *(Figure 8.)*

Building the wall was not easy. Quicksand, flooding, and continuing collapses threatened the workers. Despite these problems, the Corps completed the wall by November 1876. It extended 1,850 feet and contained nearly 15,000 cubic yards of concrete. When the Engineers finished the wall, the *Minneapolis Tribune* reported that "This artificial fortress is to stand guard for ages and defy the floods," and that the wall would ". . . Eclipse Nature and Hold Up the Mississippi River."[51] The great wall stabilized the falls and ensured that both Minneapolis and its milling industry would continue to expand. The wall is still in place, under the limestone cap at St. Anthony Falls, still helping to prevent the falls from eroding.

After completing the wall, the Corps secured the rest of the falls. Between 1876 and 1880, the Corps completed the apron over the falls. They built the two low dams above the falls to maintain a safe water level over the limestone. They constructed a sluiceway to carry logs over the falls. And, finally, the Corps filled all the tunnels and cavities under the limestone, with some 22,329 cubic yards of gravel.

The second calamity struck one year after the Eastman tunnel collapsed. During the evening of October 20, 1870, an employee of the St. Anthony Company's east side mills tried to fill a lit kerosene lantern. It exploded and set fire to the entire row of mills, burning them down and crippling the dam. Uninsured, the St. Anthony Falls Water Power Company could not afford to rebuild and sold the dam's five waterpower sites.[52]

The Lumber Mills Leave • Despite the disasters, lumber milling remained central to the city's economy. By the end of 1878, the new owners had rebuilt the east side mills on a new dam midway down Hennepin Island. And by 1880 the mills on the east side row and Farnham and Lovejoy's mill on Hennepin Island surpassed the west side. East side mills accounted for 94,977,595 board feet of the city's total timber output of 179,585,182. In 1870 the annual value of timber products milled in Minneapolis equaled $1.73 million and led the city in product value. By 1880 the annual value of the city's lumber products had swelled to $2.74 million, but had fallen to second in the value of output behind flour. Still, lumber remained the city's largest employer.[53]

Timber milling, however, was on its way out, not as an industry important to Minneapolis, but as an industry based upon waterpower at the falls. A number of factors contributed. Most importantly, steam offered an economic, alternative power source. Some sawmills had converted to steam power as early as the 1850s and 1860s. Since they could burn their scraps for fuel, timber millers stood to benefit from the shift to steam more than most industries.

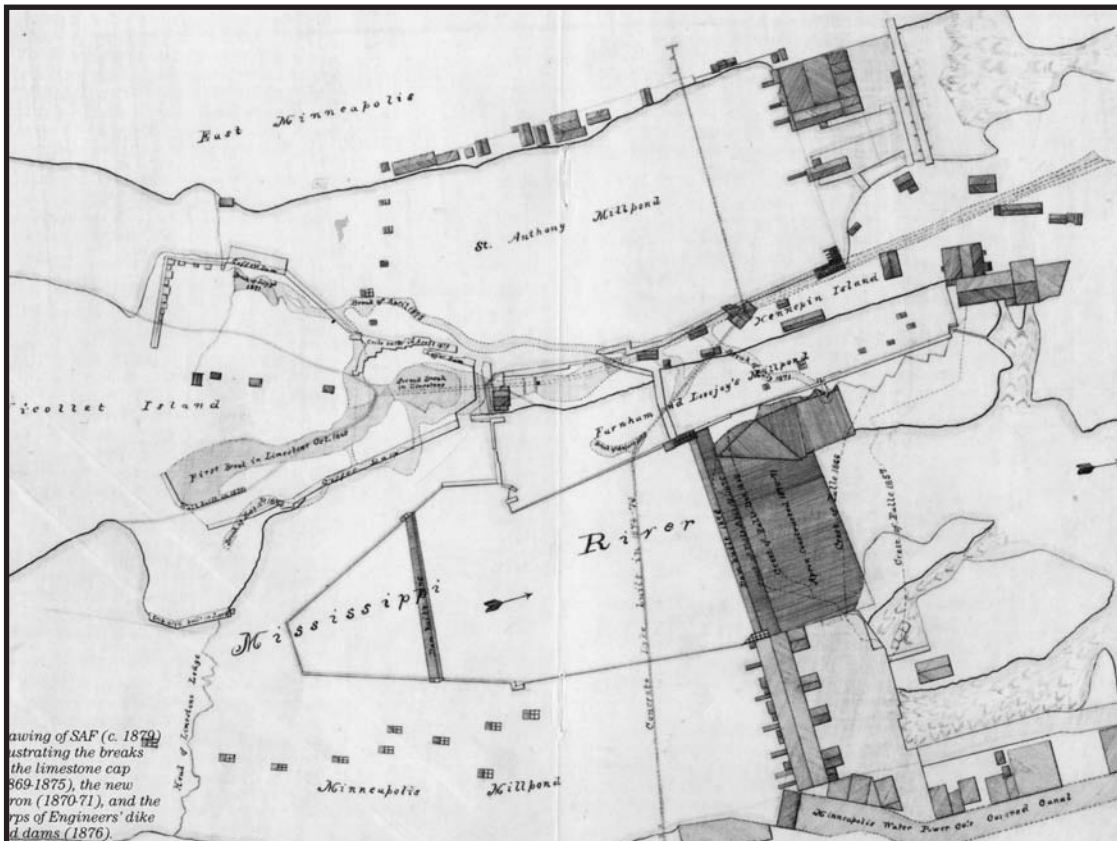


FIGURE 8. Eastman Tunnel disaster and repair work. St. Paul District.

Using steam gave the industry greater flexibility to choose where to mill their timber. It gave them the opportunity to acquire more land for lumber storage and better access to railroads on which to ship their finished products. Since the millers still needed to be near the Mississippi River, where boom companies captured their logs floating down from Minnesota's northern forests, they moved to north Minneapolis and founded a new milling center.

At the same time, flour millers began pushing for more of the falls' power. In 1876 the Minneapolis Mill Company decided not to renew the sawmill leases and by 1880 had bought out the sawmill owners. The company produced lumber for a while, but in 1887, removed the last two lumber mills. Also that year, fire again destroyed the east side sawmill row. By 1890 Bassett's sawmill, at the head of the canal, was the only sawmill on the west side. In 1895, however, Bassett's mill burned and with it went waterpowered lumber production at the falls. Begun in 1848, timber milling had lasted for almost 50 years.[54]

By 1880 the new sawmilling center in north Minneapolis produced 32,608,000 board feet of lumber. Nine years later, it supported eleven sawmills. And in 1899, the steam-powered mills of north Minneapolis would make the city the nation's leading sawmilling center for the next six years. But lumber production quickly declined thereafter. The great log drives ended a decade later and the logging era in Minnesota closed.[55]

Flour

While lumber mills initially yoked the falls, flour would become its master. In 1849 Robert Smith had been granted a lease on the Fort Snelling mills, arguing specifically that he wanted to make flour. But Smith did little. So when Richard Rogers built a small grist and flour mill on the east side in 1851, it was an important event. The 32 bushels brought to the mill in 1853 yielded the "'largest grist ever ground at the falls.'"[56] For flour production to expand, however, grain production and the region's transportation system had to develop.

Like the lumber millers, flour producers had the river as their power source. But the similarities ended here. Lumber millers had a ready-to-harvest crop in the region's native forests, and they could rely on streams and rivers to deliver their raw material. Trees were an ancient crop, waiting, so the timber barons thought, to be harvested. Wheat and other cereals required that someone break the land, plant crops and harvest them, and get the product to St. Anthony. To the settlers rushing into Minnesota and the Dakotas wheat represented a quick cash crop, and they soon provided the grain needed to spur flour milling at St. Anthony. Despite the economic Panic of 1857 and the Civil War, wheat production in Minnesota climbed from about 1,400 bushels in 1850 to 2.2 million bushels in 1860 and soared to 18.9 million by 1870.[57]

While the Mississippi and its tributaries provided the transportation system upon which loggers funneled their harvest to St. Anthony, farmers in western and southwestern Minnesota and the Dakotas needed a different and more reliable method to deliver their grain to the falls. The tremendous railroad expansion following the Civil War brought the immigrants needed to till the soil and the means to transport their crops to the millers.

Flour milling grew even faster than timber milling at the falls. In 1859 the Cataract Mill became the first commercial flour mill on the west side. Seven new mills, plus the old Fort Snelling mill, stood along the Minneapolis Mill Company's canal 12 years later. Chief among the new mills was C. C. Washburn's six-story mill, built of limestone along the west side canal in 1866. Four more flour mills operated on the east side. Drawing on the growing wheat harvests and railroad network, these mills helped boost Minnesota's flour production from 30,000 barrels in 1860 to 256,100 in 1869.[58] *(Figure 9.)*

Despite this rapid growth of flour milling, the flour produced at St. Anthony Falls, while healthy, was considered inferior. Mills from other areas used soft winter wheat that yielded a fine, pure, white flour. Minnesota's spring wheat had a harder layer near the husk than winter wheat and

FIGURE 9. Flour mills along the west side canal, 1885. Minnesota Historical Society.

required faster grinding. The high grinding speed produced so much heat that it browned the flour. Together, the hard inner layer and the bran formed a by-product the millers called the middlings. Millers often ground the middlings to make a second grade of flour, which, while nutritious, most bakers shunned.[59]

During the 1860s, however, millers in southern Minnesota developed a new process that, when combined with the other factors favoring St. Anthony, would catapult its millers and its flour to national and international fame. The new technique relied on finer millstones that ran at a slower speed. This process generated less heat and did not discolor the flour. Also, the new method did not crush the husk and hard inner layer (or middlings) as much, so they could be separated more easily from the flour. Millers could then process the middlings to remove the bran. The resulting flour was fine and white and considered the best in the world for bread making. During the 1870s, the Minneapolis millers began using the new method and soon perfected it using porcelain and steel rollers, which did not leave specks in the flour.

By 1870 flour milling was ready to take off at the falls. Between 1870 and 1880, Minnesota's wheat production nearly doubled, from 18.9 million bushels to 34.6 million, and the millers moved quickly to use it.[60] As of 1869 the west side canal had only eight mills along it, but between 1870 and 1876, millers crowded in ten new ones. Minneapolis was poised to surpass St. Louis as the nation's leading milling center. But on May 2, 1878, the Washburn A Mill exploded, killing 18 men. The explosion and ensuing fire destroyed "one-third of the city's milling capacity, as well as lumberyards, planing mills, a machine shop, a wheat-storage elevator, a railroad roundhouse, and a number of nearby residences."[61] Undaunted, the millers quickly rebuilt the district. By the end of 1878, 17 mills produced flour on the west side, led by a new Washburn A Mill. In 1880, 22 flour mills stood on the west side.[62]

On the east side, the growth of flour milling was limited by fires, the Eastman tunnel collapse and the lack of a waterpower canal. Millers had lost three mills on Hennepin Island. The Summit mill crumbled during a second cave-in of the tunnel, in 1870, and two years later the Island and

Farmers (River) mills burned. The St. Anthony mill burned in 1871. Compensating for these losses, millers built two new mills during the decade: the Phoenix and North Star. But the east side still lagged far behind the west.[63]

To get wheat, millers had to vie with other cities, including Milwaukee, St. Louis and Chicago. Competing mills sent agents throughout the Midwest to secure commitments from farmers for their grain. To counter this intrusion into what the Minneapolis millers saw as their hinterland, they initially formed a loosely organized buying pool and then, in 1876, formed the Minneapolis Millers Association. Copying their competitors, the pool sent agents into the countryside, oversaw the grading and pricing of wheat, and distributed the wheat among the mills.

While the pool increased the millers' control over wheat, it angered farmers. That anger flared during the Granger movement and led Ignatius Donnelly to challenge William Washburn for the U.S. Senate in 1878. What farmers saw as the association's abuses eventually gave rise to the Equity Cooperative Exchange, and the Equity gave rise to a farmers' cooperative movement that spread throughout the country.[64] The Equity established the nation's first terminal elevator built by a farmers' cooperative on the Mississippi's east bank in St. Paul.

As the flour millers organized to capture the region's grain, they also began consolidating their holdings at St. Anthony. By 1874 Charles A. Pillsbury and Company owned five mills and in 1879, Washburn, Crosby and Company owned three. With their eight mills, the two companies could produce over half of the city's flour.[65]

The consolidations, the Minneapolis Millers Association, the new mills, the middlings purifier, and the state's surging wheat production combined to make Minneapolis the nation's top milling city in 1880, a title it would not yield for 50 years. Between 1870 and 1880, the value of the flour millers' products rose from $1,125,215 to $20,502,305, contributing by 1880 "almost two-thirds of Minneapolis' entire value in manufactures."[66] During the decade, flour production grew from 193,000 barrels annually to 2,051,840. Flour production helped boost the overall output from the falls to new levels.

The total value of goods produced by Minneapolis and St. Anthony in 1870 was $6.8 million. By 1880 this figure had jumped to almost $30 million. Overall, waterpowered mills contributed some three-quarters of the total value of goods. Together, lumber and flour directly employed 1,722 people. Adding the industries that emerged directly and indirectly from the two staples, the falls gave work to much of the city's population. As of 1880 Minneapolis ranked first in the nation in flour production, third in lumber, and twentieth in value of manufactured output. Its population had grown from 18,079 in 1870 to 46,887 and had surpassed St. Paul by more than 4,000. It had no equal north of St. Louis and west of Chicago to the Rocky Mountains. In the West, only Kansas City and San Francisco were bigger.[67]

Events during the 1880s ensured that St. Anthony Falls held and extended its lead as the nation's and sometimes the world's leading flour producer. Under pressure from the booming flour industry and taking advantage of the opportunities offered by steam power, the sawmills were leaving the falls by the decade's end, making more room for flour mills. Adding to the falls' flour output, the east side finally provided some competition for the west. Millers on the east side had been bridled by their failure to expand the direct use of waterpower. They had attempted to build a canal system like that on the west side, but had run into a cavern. Eastman had tried to bring direct waterpower to Nicollet Island and nearly destroyed the falls.

Success finally came in 1881. The year before, the St. Paul, Minneapolis, and Manitoba Railway Company, of which James J. Hill was a stockholder and general manager, bought the St. Anthony Company for $425,000. Also in 1880 , the C. A. Pillsbury Company decided to build a huge new mill on the east side. To power it, the company had to overcome the geology that had prevented earlier attempts. Between 1880 and 1881, Pillsbury erected his Pillsbury A Mill and built a 450-foot-long canal under Main Street to

feed water to it. The limestone structure reached seven stories high and, for a short time, became the world's largest flour mill. The new mill produced almost twice as much flour as the Washburn A Mill and about one-third the maximum flour output of the entire west side. While the Pillsbury A Mill's initial production equaled some 4,000 barrels per day, the complex grew to cover two blocks and its daily production reached 17,000 barrels per day, enough to yield a 56-mile long row of 25-pound flour sacks.[68]

While Hill hoped to make milling on the east side successful, his primary interest in acquiring the mill company was to connect the east and west sides with a railroad. To accomplish this, Hill built the Great Northern stone arch bridge, completing it in 1883. Two years later, he finished a depot to go with it. With his new bridge and railroad connection, Hill was able to deliver even more wheat to the milling district, and he left a monument that is a National Historic Engineering Landmark *(Figure 10)*.[69]

The trend in consolidation begun in the 1870s continued. In 1876, 17 companies had operated 20 mills in Minneapolis, but only four companies had produced 87 percent of the city's flour. In 1889, following a national trend to milling consolidation, the Pillsbury-Washburn Company, the nation's first large milling corporation, bought out the Minneapolis Mill and St. Anthony companies. For the first time, the mills on the east and west sides came under unified ownership. By the early 1900s, three companies accounted for 97 percent of the city's flour output.[70]

Flour production at the falls continued to surge after Minneapolis became the nation's top flour producer. Flour production rose from about two million barrels in 1880 to just over six million in 1889, even though the number of mills declined from 25 to 22. But the millers increasingly turned to steam power and, soon, to hydroelectric power. Milling production grew from 13,694,895 barrels in 1908 to 18,541,650 in 1916. After 1916, however, production began to decline. "Milling-in-bond," made possible by the 1897 Dingley Tariff, allowed millers to important Canadian grain duty free, if they exported the flour made from it. Since millers along the eastern Great Lakes received Canadian grain by huge ships, they prospered more than those at St. Anthony. Increasing freight rates and outdated mill operations also hampered the millers at St. Anthony. By 1930 production at the falls dropped to10,797,194, and Buffalo, New York, became the nation's leading producer, with just over 11 million bushels. By 1960 flour production at St. Anthony fell to 5,471,456 barrels.[71]

Hydroelectric Power

St. Anthony Falls gained national attention in 1880 as the country's leading flour producer, and two years later it again achieved national recognition. In 1882, as steam power allowed the lumber mills to move away from St. Anthony, and more and more flour mills switched to steam, the falls gave birth to a new power source, a source that would replace direct drive waterpower and steam. Electricity would allow the falls' power to flow well beyond the cataract. Even before businesses at the falls had access to hydroelectric power, they began using electricity. In 1881

FIGURE 10. James J. Hill's Great Northern, Stone Arch Bridge, 1884. Photo by Charles A. Tenney. Minnesota Historical Society.

the Pillsbury A Mill purchased an individual, electric power plant and installed lights, possibly becoming the first mill in the world to do so. But large-scale hydroelectric generation from the falls would quickly replace the individual plants.

In 1881 William Washburn, Joel Bassett, Sumner Farnham, and James Lovejoy joined other Minneapolis businessmen (Otis A. Pray, Loren Fletcher, and C. M. Loring) to form the Minnesota Electric Light and Electric Motive Power Company, which they soon renamed the Minnesota Brush Electric Company. They acquired land on Upton Island from Dorilus Morrison and built a small central power station with five Brush arc-light generators *(Figure 11)*. They ran lines to bars and businesses on Washington Avenue and on the evening of September 5, 1882, lit them with electricity generated by the first hydroelectric power central station in the United States. Given the spread and impact of hydroelectric power central stations on the economy and environment of the country, this was a nationally significant event.[72]

As the Minnesota Brush Electric Company began generating electric power, it tried to expand the number of users. One of the company's first goals was to provide street lighting for Minneapolis. To do this, they had to prove that electric lighting worked, and they had to overcome the opposition of the gas light providers, who were not willing to step aside. To demonstrate the effectiveness of electric lighting, the company erected a 257-foot tower, called the mast, at Bridge Square and suspended eight arc lamps from it. On February 28, 1883, as hundreds of people watched, the company turned the lamps on. This demonstration and another a few days later convinced many that electricity would replace gas. By the end of 1885, 232 electric street lamps glowed in Minneapolis.[73]

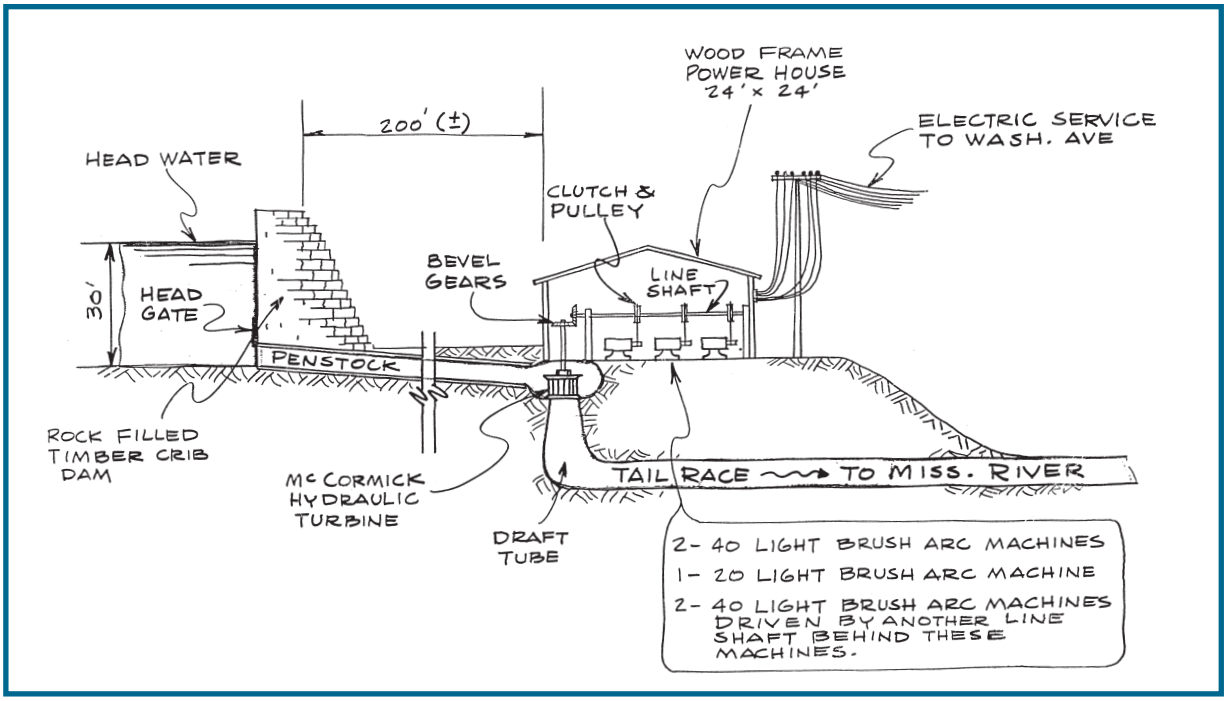


FIGURE 11. The first commercial hydroelectric central plant in the country, 1882. St. Paul District, Corps of Engineers.

Locally the Minnesota Brush Electric Company demonstrated the potential of hydroelectricity. And in 1894, when the Niagara Falls hydroelectric power plant went on line, it showed Americans that hydroelectricity was more than a curiosity; it had come of age.[74] By the turn of the century, hydroelectric power companies perfected their ability to transmit electricity over long distances,

spurring the spread of hydroelectric plants.

St. Anthony Falls stayed at the forefront of hydroelectric power generation. In 1894 the Pillsbury-Washburn Company leased 20 mill powers to the Minneapolis General Electric Company, and over the next two years, the company built its Main Street Station. And in1895, William de la Barre, the genius behind the development of waterpower at St. Anthony Falls, began building the Lower Dam and Hydropower Station, about 2,200 feet below the falls. As the project took shape, some chided it as "De la Barre's Folly." But once it was completed, Charles Pillsbury claimed it was one of the "'greatest engineering feats of the present century.'" The *Electrical Engineer* suggested that "'in scope and character;" only the Niagra facility surpassed it. The new power station provided electricity to the streetcars of the Twin City Rapid Transit Company. De la Barre also convinced the Pillsbury-Washburn Company to let him build the Hennepin Island Plant near the Main Street Station, between 1906 and 1908.[75]

De la Barre had come to Minneapolis in 1878 and was hired by the Minneapolis Mill Company in 1883 *(Figure 12)*. Until he died in 1936, he made extracting the falls' maximum power potential his passion. At Franklin Steele's original dam, the head–the distance the water fell from above the dam to below it–totaled only eight feet. By 1889 de la Barre had elevated the average head to 36 feet and later raised it to 45 feet.

Under de la Barre's direction, the working capacity of turbines at the falls increased from 13,000 horsepower in the 1880s to 55,068 horsepower by 1908. Overall, the hydroelectric plants accounted for about 25,000 horsepower, the flour mills another 24,000 and the City of Minneapolis, North Star Woolen Mills Company, and others the remainder.[76] In 1923 Northern States Power bought the hydroelectric power company firms from Pillsbury Flour Mills. By 1960, when construction on the Upper St. Anthony Falls Lock and Dam cut off the west side waterpower canal, all the mills at St. Anthony Falls had shifted from direct hydropower to hydroelectricity.

Other Industries

Many other industries grew up at the falls, either feeding off the mills or trying to employ the waterpower towards ends other than timber and flour milling or hydroelectric power. Foundries and machine shops repaired and constructed railroad cars and engines, made steam engines, ornamental iron, farm implements, and milling equipment. Others hoped to produce paper at the falls. A paper mill was among the earliest industries to tap the falls' power. Built on Nicollet Island in 1859, the mill initially produced much of Minnesota's printing paper. Another paper mill

***FIGURE 12. William de la Barre, the mastermind of hydropower development at St. Anthony Falls. Kane*, The Falls of St. Anthony.**

was established on the west side in 1866-1867. Iron and paper industries, however, failed to grow at the falls.

Some entrepreneurs, hoping to recreate New England's success, had looked to Lowell and other northeastern milling centers as their model, not only for the west side's production system but for the commodities they should produce. Like New England, they expected the falls to support a booming textile industry. They thought it only natural that Southern cotton should move up the Mississippi River and their finished products would move down it. By the mid-1860s two textile mills manufactured flannel, cassimere, scarves and yarn. Two carding mills opened during the same time, one on each side. In 1870 Dorilus Morrison joined other business interests to build the Minneapolis Cotton Manufacturing Company. At first it produced only seamless flour bags but moved into wagon covers, duck for tents, and awnings. In 1881, however, the mill closed.[77]

Despite expectations, only one textile mill prospered at St. Anthony Falls: the North Star Woolen Mill, which W. W. Eastman and Paris Gibson founded in 1864. Although it went bankrupt in 1876, the Minneapolis Mill Company bought it, and it subsequently produced textiles up to the 1940s. The mill produced cassimere, flannel, scarves, and yarn, but became renowned for its blankets. At the 1876 Centennial Exposition in Philadelphia, the company won the highest prize for product quality.[78]

Summary

From ancient times when Native Americans frequented St. Anthony Falls for reasons we can only guess, to today, the falls has been a geologic marvel and a geographic landmark. It has attracted those who sought the blessing of its spirits, the majesty of its natural beauty, and the energy of its falling waters. If the historic accounts provide any indication, its natural beauty and power made it a place of deep spirituality for Native Americans of many different tribes for thousands of years. The same beauty and power made the falls a national and international attraction, the destination of writers, painters and tourists. That energy gave St. Anthony national recognition and international fame for its timber, flour and hydroelectric production. While the falls is still important for its energy, more and more people are returning to admire its power in other ways, ways more akin to much earlier times. This has only become possible since milling at the falls died and opened the falls to new uses.

Minneapolis not only lost its title as the nation's flour capital in 1930, it began removing many of the mills that had made it famous. In 1931 alone, at least seven mills came down, followed by several more during the decade.

By 1956 only the Pillsbury A Mill remained on the east side, and the company blocked off the headrace, which had been so hard to get, and shifted the mill to hydroelectric power.

As the Corps completed work on the Lower and Upper St. Anthony Falls Locks and Dams (fulfilling Minneapolis' vision of becoming the head of navigation), more of the mill district's historic fabric disappeared. To build the lower lock and dam, the Corps had to remove the 1897 dam built for the lower hydropower station by de la Barre. In 1960 the Corps filled the west side canal, and the gatehouse at its head was taken down. In 1965 the Washburn A Mill produced its last flour and ended flour production on the west side. As part of its construction of the upper lock, the Corps filled over the old tailraces that had run from the mills along the canal to the river. (With the city's development of Mill Ruins Park, the mill races have again been exposed.) As "urban renewal" took hold in the 1950s and 1960s, more of the west side mills were torn down. The sixties also brought the birth and growth of historic preservation. Without an active milling industry and with a new interest in the falls, the opportunities to get near the cataract and interpret its history are now being realized.[79] *(Figure 13.)*

FIGURE 13. Rediscovering the roots. Mill Ruins Park, Minneapolis.