

SPIRITUAL POWER TO INDUSTRIAL MIGHT

12,000 Years at St. Anthony Falls

JOHN O. ANFINSON

IN MARCH 1680 A LARGE PARTY OF DAKOTA MEN beached their canoes in the marsh at the mouth of Phalen Creek near present-day downtown St. Paul. They had returned from far down the Mississippi River with three French-speaking travelers: Michael Accault, Antoine Auguelle, and Father Louis Hennepin. The captives had been looking for the Mississippi River's source and the Northwest Passage, the fabled all-water

route to the Far East. After hiding their canoes, the Dakota hurried northwest about 100 miles to their villages around Mille Lacs.¹

In July the Dakota and their captives canoed down the Rum River to the Mississippi River, near present-day Anoka. Hennepin and Auguelle, anxious to find their main party, received permission to continue down the Mississippi. They quickly reached the great falls, and, in





The powerful, roiling waters of St. Anthony Falls, 1865. The double towers of the 1854 suspension bridge crossing the Mississippi from Nicollet Island to Minneapolis are visible in the background.

the first act of occupation in what became the Twin Cities, Hennepin named the cataract for his patron saint, Anthony of Padua.

The encounter between the Dakota and the Europeans marked a new epoch in the history of the upper Mississippi and the falls. For 10,000 years Native Americans had had the river to themselves. After 1680, Europeans and then Americans would increasingly define human interaction at the river and alter its physical and ecological character.

No place anchors the upper Mississippi's historical significance like St. Anthony Falls. No place matches its regional, national, even international importance. Geologically, it is the only major falls on the entire river. Historically, it attracted a who's who of European and American exploration, including Hennepin in 1680, British adventurer Jonathan Carver in 1766, and American explorer Zebulon Pike in 1805. Economically, it created a city with no peer between Chicago, the Rocky

Mountains, and St. Louis. St. Anthony Falls gave birth to the sawmilling and flour-milling industries that led production in the United States and the world. It also produced the first commercial hydroelectric central plant in the country. Underlying this history is the river's unique geology.

IMAGINE STANDING ON THE BLUFFS above present-day downtown St. Paul about 12,000 years ago. You would be drenched by the spray and deafened by the roar of an immense waterfall some 2,700 feet across and 175 feet high. Meltwater from the colossal Glacial Lake Agassiz covering much of northwestern Minnesota and southern Canada thunders over it. Above the falls a thick, hard mantle of Platteville limestone covers a thin veneer of shale and mixed sandstone and a deep deposit of soft St. Peter sandstone. As the meltwater boils over the falls and bounces back at the soft sandstone, it undermines the limestone riverbed until huge, unsupported chunks

LEFT: *The earliest known view of the Falls of St. Anthony (and Indian encampment above), published in Jonathan Carver's Travels, 1778*

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break off. The falls recedes, and the process begins again. Since Father Hennepin's time the falls has moved 1,500 feet upstream to its present location.

Today the river descends faster between Minneapolis and St. Paul than anywhere along its course—more than 100 feet in less than 15 miles, mostly in the 8.5-mile-long gorge between Fort Snelling and St. Anthony. Fast and turbulent during high water, the river becomes a shallow, rocky stream during low water with navigation ranging from treacherous to impossible. In the nineteenth century this difficult geology would make St. Paul the head of navigation and upstream Minneapolis a waterpower metropolis.

WE KNOW VERY LITTLE ABOUT how Native Americans related to the falls over the last 12,000 years. Where they viewed the cataract or portaged around it probably changed as the falls slowly retreated. Few artifacts tell of their presence, although some fluted points (Clovis and Folsom) and unfluted spear points (Plano) demonstrate the presence of ancient Native Americans along the gorge.²

When the European travelers arrived in 1680, the Dakota lived around Mille Lacs and the Mississippi River headwaters, controlling the river down past St. Anthony Falls as a route for hunting and warfare. By the mid-eighteenth and early-nineteenth centuries, however, the Ojibwe occupied the headwaters, and the Dakota had moved into the present-day Twin Cities area and as far downriver as Wabasha.

Although Hennepin felt compelled to name the falls, Native Americans already had many names that described its character. The Ojibwe used *Kakabika* (severed rock) and *Kichi-Kakabika* (great severed rock) for the fractured limestone blocks littering the base of the falls. The Dakota called the falls *Minirara* (curling water), *O-Wa-Mni* (whirlpool), *Owahmenah* (falling water), and *Haha Tanka* (big waterfall).³

While Hennepin's account of his visit is sketchy and culture bound, it makes clear that the falls possessed energy, spirituality, and history for the Dakota. As Hennepin's party portaged around the falls, he witnessed a Dakota man praying to *Oanktehi*, the spirit of waters and evil, who resided below the falls. Hennepin wrote 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." The man, according to Hennepin, sought safe passage, good hunting, and success in battle.⁴

For the Dakota, the falls also served as a source of special clay. During American explorer Henry Rowe Schoolcraft's 1820 expedition, he observed the Dakota collecting a brownish-red clay for painting baskets and canoes from "close under the sheet of the principal column of water." The Dakota, he judgmentally noted, "pretend that it is renewed when taken away."⁵ The Dakota, of course, were not pretending; they believed that a spirit at the falls supplied the clay. How many stories, traditions, and ceremonies the Dakota, Ojibwe, or other Native Americans had for the falls, we cannot begin to guess.

Some Dakota bands lived at, near, or within a few hours of the falls when American explorers and settlers arrived in the nineteenth century. The Dakota tapped sugar maples on Nicollet Island. Cloud Man, who had a village at Lake Calhoun, occasionally camped at the falls. Good Road's band of about 10 tipis sometimes gathered near what is now downtown Minneapolis. Little Crow's village, *Kaposia*, was just below Phalen Creek. Indians knew the falls in many senses.⁶

IT IS DIFFICULT TO IMAGINE THE LOOK of the natural falls today: a lock and spillway, two overflow spillways, bridges, buildings, power lines and poles, and miscellaneous clutter present too great a challenge. Water sliding smoothly over the concrete spillway bears no resemblance to the way the river broke raucously over the zig-zagging edge and fractured slabs piled up below. Fortunately, European and American explorers, government officials, and early tourists left many descriptions of the geologic marvel.

Most early visitors compared the falls to Niagara and other major cataracts, measuring St. Anthony by standards that seem inappropriate. In 1680 Hennepin estimated that it plunged 40-to-60 feet; 20 years later, Jean Pénicaud agreed with the highest figure. In 1766 Carver slashed the height to 29 feet, and in 1805 Pike calculated its drop at 16.5 feet.⁷ The cataract's move upstream cannot account for the discrepancy.

Hennepin and Pénicaud undoubtedly exaggerated and miscalculated. 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." In 1817 American explorer Stephen Long also figured the vertical fall to be 16.5 feet, but, relying on Pike's estimate, he noted that from the beginning of the rapids to the "portage road" about 4,000 feet downstream, the river fell 58 feet. With this, the total drop

from the beginning to the end of the rapids approached 75 feet. If Hennepin included part of the rapids in his calculation, he may not have been so far off.⁸

St. Anthony Falls did not need a great plunge to make it impressive. Its unique, rugged geology created a captivating multitude of smaller falls. Water kicked up in all directions. Several forested islands—Nicollet, Hennepin, Spirit, Boal, and Cataract—complicated the flow of water, adding to the falls' appeal. Spirit Island, about an acre in size, according to Carver, possessed "several oak [cedar] trees on which are a vast many eagles' nests," because of "the great numbers of fish that is killd in attempting to get up and down the falls." Above it the prairie rolled to the river's edge; below, the river fell into the gorge.⁹

The sounds created by breaking water added to the falls' aura. In 1700 Pénicaut said the falls roared like thunder; Carver claimed he could hear it from 15 miles away. More astonishing, George W. Featherstonhaugh, a British geologist who visited in 1835, insisted that he heard the falls from almost 30 miles away.¹⁰

The descriptions of St. Anthony's natural character and the advent of steamboat navigation on the upper Mississippi River in 1823 gave rise within several decades

to the "fashionable tour," which brought wealthy Easterners to see the river and the falls. Writers, artists, and tourists left their visual and written accounts, embellishing upon St. Anthony's grandeur—a pristine grandeur that would soon disappear.

THE INCREASING NUMBERS OF SETTLERS and squatters around Fort Snelling and the falls left little to indicate their feelings about the area's beauty. We do know that they anxiously awaited the opportunity to capture the energy and economic promise the falls offered. As early as 1819, Lt. Col. Henry Leavenworth recognized St. Anthony's hydropower potential. To service the fort's construction and operation, he suggested building a sawmill and grist mill at St. Anthony. His successor, Col. Josiah Snelling, built the mills and two barracks on the west bank between 1821 and 1823. They presaged St. Anthony's future.

In 1838 government treaties with the Dakota and Ojibwe gave the United States title to the lands between the St. Croix and Mississippi Rivers. Anticipating the news that arrived on July 15, 1838, Franklin Steele had staked a claim on the east side of the falls during the

A large Ojibwe party portaging around the east side of St. Anthony Falls, published in George Catlin's 1841 Letters and Notes on the Manners . . . of the North American Indians



middle of the previous night, outwitting Fort Snelling's commandant and other would-be landowners. Twenty-five-year-old Steele was a storekeeper at Fort Snelling and part owner of the St. Croix Falls Lumber Company. His moonlight claim made him the founder of the milling industry at the falls and the town of St. Anthony. On his heels, other squatters quickly claimed land east of the river. (The west side would not become available officially until 1855.)¹¹

Steele had most of what he needed to put St. Anthony Falls' tremendous potential to work. From St. Anthony to the Mississippi's headwaters and beyond, conifers and hardwoods shaded the land. The Mississippi and its tributaries provided the transportation routes needed to deliver raw wood to the power source at the falls and to ship the finished products to local, regional, and national markets.

Delayed by financial problems, Steele had to wait until 1847 to realize his ambitions. That year he built a mess hall, carpentry and blacksmith shops, stables, and a bunkhouse by the falls, and after one false start, his crews completed a dam and sawmill in 1848. The dam ran from the east 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. By the end of the year, two up-and-down saws operated on it. An upstream pond floated the logs before milling, and a 50-foot-wide platform adjacent to the mill held the cut lumber.

Steele's dam and mill heralded the end of an epoch. Since the retreat of the glaciers, natural forces had defined the falls' physical appearance, the sounds it made, and the rate and path of its retreat upstream. After 1847 the sight and sounds of the natural falls rapidly disappeared, and human actions came to define its physical character. The dam also heralded a new era, as timber milling spurred clear-cutting of forests, and flour milling would soon fuel plowing of the natural prairies.

From 1849 to 1852 the number of sawmills on Steele's dam grew to four, and daily production increased from 15,000 to 50,000 board feet. By 1855 the daily output had doubled, and the yearly output had jumped to 12 million feet. Much of the milled lumber jostled down elevated sluiceways that snaked from the mills to well below the falls, where it was formed into rafts and floated to St. Louis.

Logs in an east-falls pond await milling, about 1856, while a young Minneapolis sprouts across the river to the west.





Workers send logs up a slip to become boards, shingles, and sawdust at C. A. Smith's sawmill in north Minneapolis, about 1885

Steele's success intensified interest in the falls' west side, which remained locked within the Fort Snelling military reservation. Would-be lumber barons gazed across the river, knowing that whoever grabbed the land would control half the river's power. The federal government, however, refused to lease or sell the old Fort Snelling mills or any other land there to private citizens.

Then, in 1849 two individuals gained a foothold on the western shore. Illinois Congressman Robert Smith won a five-year lease on the Fort Snelling mills and a nearby house. His plan, he claimed, was to live in the house and grind flour for local use. Franklin Steele suggested to his friend John H. Stevens that Stevens request access to 160 acres upstream from Smith. Steele thought Stevens could gain a foothold in exchange for the land by proposing to ferry troops and supplies for newly built Fort Ripley up the Mississippi. The ploy worked, and during the winter of 1849-50 Stevens erected the first

permanent European American home in what would become Minneapolis.

The federal government spurred a popular rush to claim the west side by negotiating the 1851 Treaties of Traverse des Sioux and Mendota, under which the Dakota ceded nearly all of their land in what would become the state of Minnesota. In 1852 Congress passed a bill removing 26,023 acres from the 34,000-acre Fort Snelling military reserve, including the area around St. Anthony Falls. By 1854 some 300 squatters inhabited the west side, and a year later Congress recognized their rights to buy the land on which they were living. New settlers hurried across the river, the government began selling the land, and by 1856 the west side's population had jumped to 1,555.¹²

That year, milling interests formed companies to manage the river's waterpower and obtained perpetual charters from the Minnesota territorial legislature. On the

west side, Smith and 11 others organized the Minneapolis Mill Company. Across the river, Steele and his partners created the St. Anthony Falls Water Power Company.¹³

To secure its share of the water, Minneapolis Mill Company in 1856 began building a dam out into the river and then angled it upstream to meet a new dam constructed by the St. Anthony company in 1857. Finished in 1858, the joint dam ran for 2,206 feet and created a V pointing upstream that directed river water to the mills on either side. This often left the center of the falls dry, exposure that accelerated deterioration. The dam established the basic shape of the falls that is still evident today.¹⁴

As sawmills crowded onto the west-side dam, taking all the available power, Minneapolis Mill began a canal system in 1857 to extend the falls' power to mills located

back from the river. Workers broke through the limestone cap and removed the soft, underlying sandstone to create a canal 14 feet deep, 50 feet wide, and 215 feet long (later extended and deepened). The canal system included turbine or wheel pits, a labyrinth of underground tunnels, headraces and tailraces leading off and back into the river, and an open canal. Altogether, the system ran for about three miles. With this boost, by 1869 the west side was producing twice as much lumber as the east.¹⁵

Based on this success, lumber milling soon became vital to Minneapolis, which incorporated the town of St. Anthony in 1872. Annual output grew from about 12 million board feet in 1856 to about 90 million in 1869. In all, 18 lumber mills with as many different owners operated at the falls by 1869—the year disaster struck.¹⁶

Millers dug a tunnel from Nicollet Island under Hennepin Island to funnel “used” mill water back into the river. Its collapse in October 1869 dashed these Hennepin Island mills—and hopes of enhanced waterpower in the east-falls district.





An 1872 map (detail) by Hawkins Brothers shows the relationship of the islands and the falls.

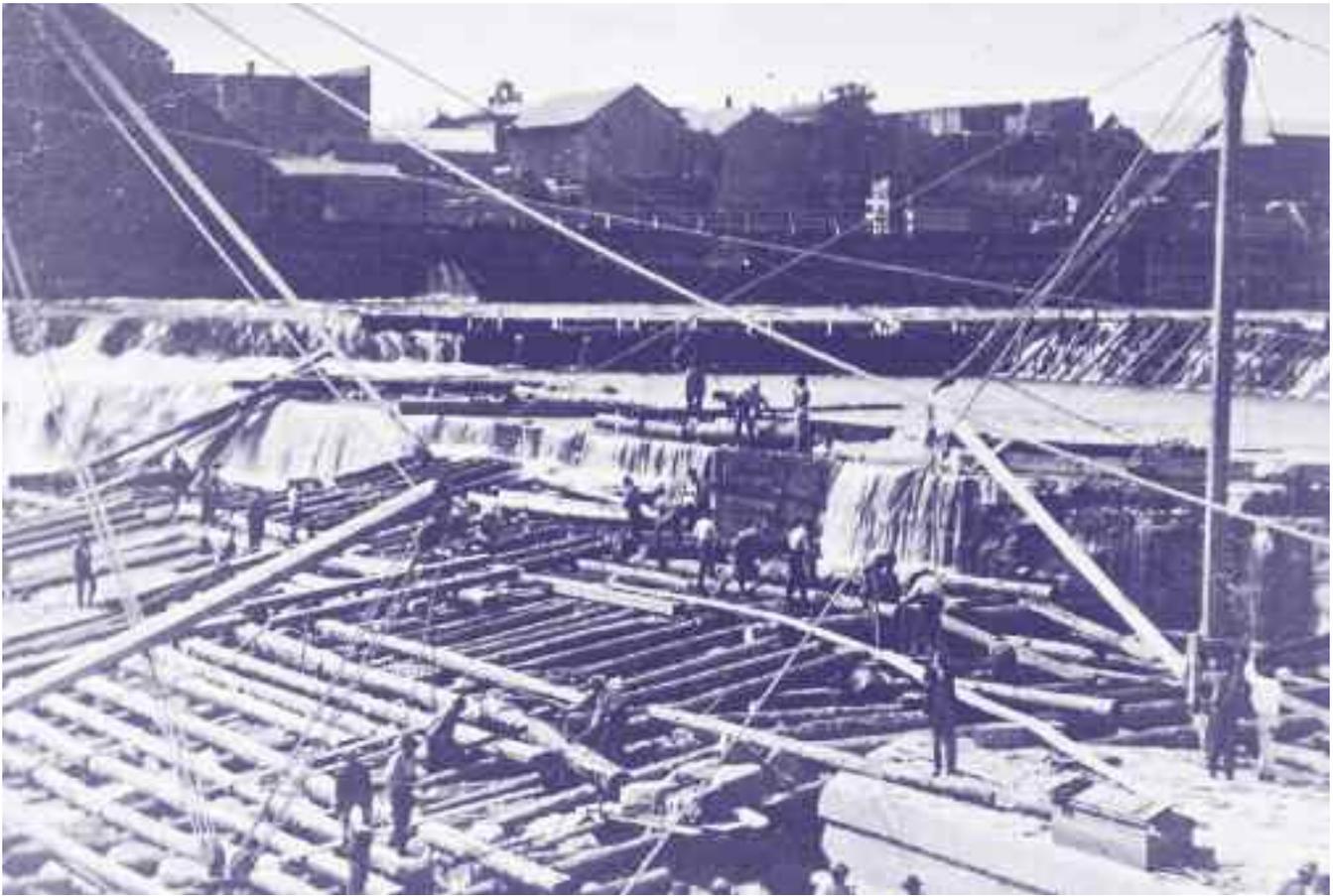
HAD EXPLORER HENNEPIN ARRIVED a few ticks of the geologic clock later, there would have been no falls for him to rename. Less than 1,000 feet upstream from the cataract, the limestone that capped the soft sandstone ended. Had the falls eroded this far, it would have disintegrated into a tumbling rapids. A scheme developed by William W. Eastman and John L. Merriam to expand milling above the falls nearly let slip the clock's final seconds.

Eastman and Merriam bought Nicollet Island, including its waterpower rights, in 1865 and then accused the millers of taking their water. To avoid a protracted legal battle, the millers compromised. They agreed to let Eastman and Merriam build a mill on Nicollet Island and run a tailrace to it from the toe of the falls. Excavation began on September 7, 1868, and by October 4, 1869, workers had tunneled beneath the limestone riverbed through 2,000 feet of sandstone from the edge of the falls and under Hennepin Island to Nicollet Island. That morning, workers discovered water leaking and then pouring into the tunnel's upper end. The water quickly ate away the soft sandstone. Within hours, the

6-foot-square tunnel grew into a cavern 90 feet wide and 16.5 feet deep. The next morning, the overlying limestone riverbed collapsed. A large whirlpool formed, sucking in everything nearby and spitting it out the tunnel.¹⁷

Word spread quickly that the falls was disintegrating. 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. Men 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 over the dumb force of nature." Nature took exception. As people scrambled off, the river devoured the feeble structures. One local newspaper exclaimed that the whirlpool tossed "immense logs and sticks of timber about as though they were mere whitlings," standing them on end "as if in sport" and swallowing them.¹⁸

Minneapolis residents and millers turned to the U.S. Army Corps of Engineers for help in stopping the falls from eroding. The Corps examined the falls in November 1869 but had no money and, with improved naviga-



Men work on an inclined apron of protective timbers over huge pine logs and rock, about 1870, to prevent the falls from eroding farther upstream.

tion its primary mission, no authority to help. Then, in July 1870, Congress gave the Corps \$50,000 to preserve the falls and save navigation above St. Anthony, which, local citizens argued, would become impossible if the falls collapsed entirely.¹⁹

For three years the river baffled the Corps, as well as millers and citizens who tried repeatedly to plug holes and line the tunnel with concrete. But the water kept finding new ways under the limestone cap, scouring new tunnels and cavities, and the falls continued to erode. A detailed survey finally showed that water was seeping under the upstream end of the limestone cap and eating its way through the sandstone. Unless blocked, water would undercut the remaining limestone, and the falls' 12,000-year history would end.²⁰

Unable to save the falls by plugging leaks, the Corps in 1874 recommended building two low dams where the east- and west-side dams joined so that water would always flow over the central falls. The Corps also wanted to rebuild the timber apron started in 1866 to preserve the edge of the falls and, most importantly, construct a

massive wall from one side of the river to the other under the limestone cap. Everyone agreed.

In July 1874 the Corps began the wall that extended up to 39 feet below the 11-to-25 foot limestone cap. Above the limestone lay sand, muck, and the river. Despite quicksand, flooding, and continuing collapses, the 1,850-foot-long concrete wall was completed by November 1876. The great wall under the river secured the stability of St. Anthony Falls and, with it, the future of milling. (This wall is still in place, holding back the clock from its final tick.)

The Corps next secured the rest of the falls, completing a new apron in 1880 that traded the natural vertical drop for a smooth, slanted slide across concrete. The engineers also built two low dams above the falls to maintain a safe water level over the limestone at the falls' center and constructed a sluiceway to carry logs over the falls. Finally, the Corps filled tunnels and cavities under the limestone with some 22,329 cubic yards of gravel. The sights and sounds of the natural falls disappeared forever.²¹

CONFIDENT IN THE CORPS' WORK, Minneapolis's millers resumed their relentless expansion. By 1880 the annual value of lumber-industry products, which had swelled to \$2.74 million, took second place behind the output of flour. Lumber had been the city's largest employer, but timber milling based upon waterpower at the falls was on its way out. Steam increasingly offered an economical alternative, allowing millers to burn their scraps for fuel and to locate mills near lumber-storage facilities and railroad lines on which they now shipped their products. Since sawmillers still needed to be near the Mississippi River to capture logs floating down from northern forests, they moved out of the heart of the growing city to a new milling center in north Minneapolis.²²

At the same time, flour millers began pushing to get more of the falls' power. By 1880 Minneapolis Mill had bought out the east-side sawmill owners. It continued to produce lumber for a while but removed the last two lumber mills in 1887, the year that fire again destroyed the east-side sawmill row. By 1890 Bassett's sawmill, at the head of the west-side canal, was the only one left there. When it burned in 1895, a half-century of water-powered lumber production at the falls ceased.²³

Everything about timber had been chaotic. Logs floated helter-skelter, at times jamming the river. Stray logs and lumber escaped over the falls to catch in shallow rapids below. During high flows, massive logs pounded the falls' edge, hastening its retreat. Mills crammed the river's banks, dams, and islands. Rickety sluiceways on stilts snaked below the falls, carrying away cut lumber. Millers stacked it anywhere they could. By century's end the chaos of timber gave way to a more rigid order at the falls.

Reservoirs for Navigation?

Between 1880 and 1907, under the guise of navigation improvements, St. Anthony's millers tried to influence Congress to authorize six dams at the Mississippi's headwaters. Low water constantly hampered commerce on the river below St. Paul, and boosters believed that a series of reservoirs could store winter snowmelt for release later in the year. Millers liked this idea because the water would pass through St. Anthony first, providing a more constant flow for their turbines.

Congress, which initially balked at the project's pork-barrel appearance, finally authorized an experimental dam for Lake Winnibigoshish in 1880 and the remaining dams shortly afterwards. Winnibigoshish was constructed in 1883–84, Leech Lake and Pokegama Falls in 1884, Pine River in 1886, Sandy Lake in 1895, and Gull Lake in 1912. In 1895 the Corps reported that releasing water from the headwaters reservoirs successfully raised the water level in the Twin Cities by 12-to-18 inches. While this helped both navigation interests and the millers, it inundated Ojibwe settlements along the way.

Sources: Corps of Engineers, *Annual Report*, 1869, p. 237; 1895, p. 2103–04, 1901, p. 2309; Raymond H. Merritt, *The Corps, the Environment, and the Upper Mississippi River Basin* (Washington, D.C.: GPO, 1984), 1; Merritt, *Creativity*, 68–74; Jane L. Carroll, "Dams and Damages: The Ojibway, the United States, and the Mississippi Headwaters Reservoirs," *Minnesota History* 52 (Spring 1990): 4–5.

WHILE LUMBER INITIALLY YOKED the falls, flour would become its master. Flour producers also used the river as their power source, but they did not have a ready-to-harvest crop and they could not rely on the river to

*The milling districts at the falls in 1870: Minneapolis (left) and St. Anthony, on the eastern shore (right).
In the foreground (from left) are Upton, Spirit, and Cataract Islands.*





LEFT: *The Washburn A Mill exploded in 1878, killing 18 people and reducing Minneapolis's milling capacity by one-third.*

RIGHT: *Washburn began building a new and much larger A Mill on the site in 1879 (now home of the Mill City Museum).*

Railroad cars entered the building at left.

deliver grain to them. Wheat required that people break the land, plant and reap crops, and get the product to St. Anthony Falls. The rush of settlers to Minnesota and the Dakotas looking for a quick cash crop soon provided the grain needed to spur on flour milling at St. Anthony. Despite the economic Panic of 1857 and the looming Civil War, wheat production in Minnesota climbed from about 1,400 bushels in 1850 to 2.2 million bushels in 1860. Railroad expansion after the Civil War brought ever more immigrants to till the soil and the means to transport their crops to mills. Wheat production soared to 18.9 million bushels by 1870.²⁴

Flour milling at the falls grew even faster than had timber milling. In 1859 the Cataract Mill became the first commercial flour mill on the west side. A dozen years later, seven new mills stood along Minneapolis Mill's west-side canal. Chief among them was Cadwalader C. Washburn's six-story limestone B Mill, built in 1866. Four more flour mills operated on the east side, helping boost Minnesota's flour production from 30,000 barrels in 1860 to 256,100 in 1869.²⁵

By 1870 Minneapolis was poised to surpass St. Louis as the nation's leading flour-milling center. In the next decade Minnesota's wheat production nearly doubled, and the value of milled products rose from \$1.1 million to \$20.5 million. As millers organized they also began consolidating their holdings at St. Anthony Falls. By 1874 Charles A. Pillsbury and Company owned five mills,

and in 1879 Washburn-Crosby Company owned three. Together, the two companies produced more than half of the city's flour. When the Washburn A Mill exploded on May 2, 1878, killing 18 men and instantly destroying one-third of Minneapolis's milling capacity, undaunted entrepreneurs quickly rebuilt the district. By the next year, 17 mills produced flour on the west side, led by a new Washburn A Mill. (On the east side, fires, the collapse of the Eastman tunnel, and the lack of a water-power canal limited flour milling.) By decade's end, flour milling accounted for almost two-thirds of Minneapolis's entire value in manufactures.²⁶

Together, lumber and flour directly employed 1,722 people. If supplier and product industries are added in, the falls directly or indirectly employed much of the city's population. As of 1880 Minneapolis ranked first in the nation in flour production—a title it would hold for 50 years—third in lumber, and twentieth in value of manufactured output. The city's population had grown from 18,079 in 1870 to 46,887, surpassing older St. Paul by more than 4,000. Minneapolis had no equal north of St. Louis and west of Chicago except for Kansas City and San Francisco.²⁷

Events during the 1880s ensured that St. Anthony Falls would hold onto its position as the nation's and, at times, the world's leading flour producer. As the departing sawmills made more room for flour mills, the east side finally provided some competition for the west.

In 1880 the St. Paul, Minneapolis, and Manitoba Railway Company, of which James J. Hill was a stockholder and general manager, bought St. Anthony Water Power Company for \$425,000. That same year, the Pillsbury company began building its huge new A Mill on the east side and a 450-foot-long canal under Main Street to feed it with water. Seven stories high, the limestone mill designed by LeRoy Buffington was, for a short time, the world's largest flour mill. It produced almost twice as much flour as the Washburn A Mill and one-third the maximum output of the entire west side. While Pillsbury A Mill's initial production totaled some 4,000 barrels per day, the complex grew to cover two blocks, and its daily production reached 17,000 barrels per day, purportedly enough to yield a line of 25-pound flour sacks 56 miles long.²⁸

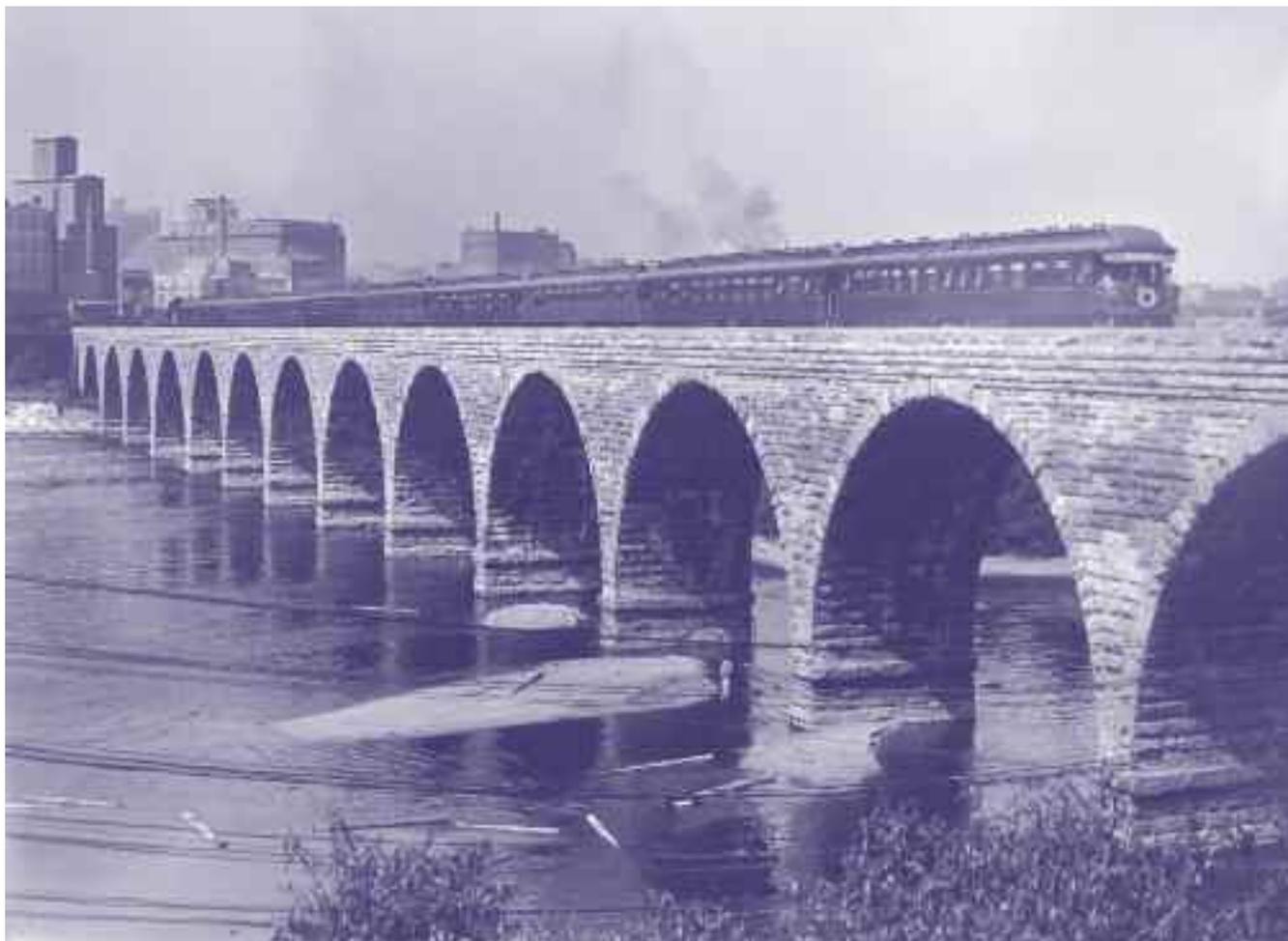
While Hill hoped to make milling on the east side successful, his primary interest was connecting the east and west sides with a railroad. To accomplish this, he

completed the Great Northern Stone Arch Bridge in 1883. With his new bridge and railroad connection, Hill was able to deliver even more wheat to the milling district (as well as leave a handsome monument that ranks as a National Historic Engineering Landmark). Hill's tracks added to the growing blanket of iron rails covering the west side, where the prairie once ran up to the river.²⁹

Consolidation continued. In 1889, following a national trend, a London-based financial syndicate purchased several Minneapolis firms, creating the new Pillsbury-Washburn Flour Mills Company, the nation's first large milling corporation and the largest flour miller in the world. For the first time, mills on the east and west sides came under unified ownership. By the early 1900s, three large companies accounted for 97 percent of the city's flour output.³⁰

While flour production at the falls continued to surge, Minneapolis millers increasingly turned to steam

James J. Hill's Stone Arch railroad bridge, constructed of granite and limestone in 1881-83 and photographed here in about 1915, allowed freight and passengers to move across the river that divided the city and its milling districts.



power and, soon, to hydroelectricity. Flour output grew from 13.7 million barrels in 1908 to 18.5 million in 1916 but then began to decline. The 1897 Dingley Tariff allowed millers to import Canadian grain duty free if they then exported the flour. Since millers along the eastern Great Lakes received Canadian grain by huge ships, they more easily prospered than those at St. Anthony. Increasing freight rates and outdated mill operations also hampered Minneapolis's millers. By 1930 production at St. Anthony Falls dropped to 10.8 million barrels, and Buffalo, New York, became the nation's leading mill city. By 1960 flour production at St. Anthony had fallen to 5.5 million barrels.

Having lost its title as the nation's flour capital in 1930, Minneapolis began removing many of the mills that had made it famous. In 1931 alone, at least seven came down, followed by several more during the decade. By 1956 only the Pillsbury A Mill remained on the east side; the company blocked off the headrace

Arc lamps on a 257-foot mast in Bridge Square, 1883, demonstrated the effectiveness of electric street lighting powered by the country's first hydroelectric central station. The towers of the second Hennepin Avenue suspension bridge loom in the background.



that had been so hard won and converted to hydroelectric power. In 1965 the Washburn A Mill produced its last flour, ending milling on the west side. Urban renewal in the 1950s and 1960s brought more of the west-side mills down.³¹

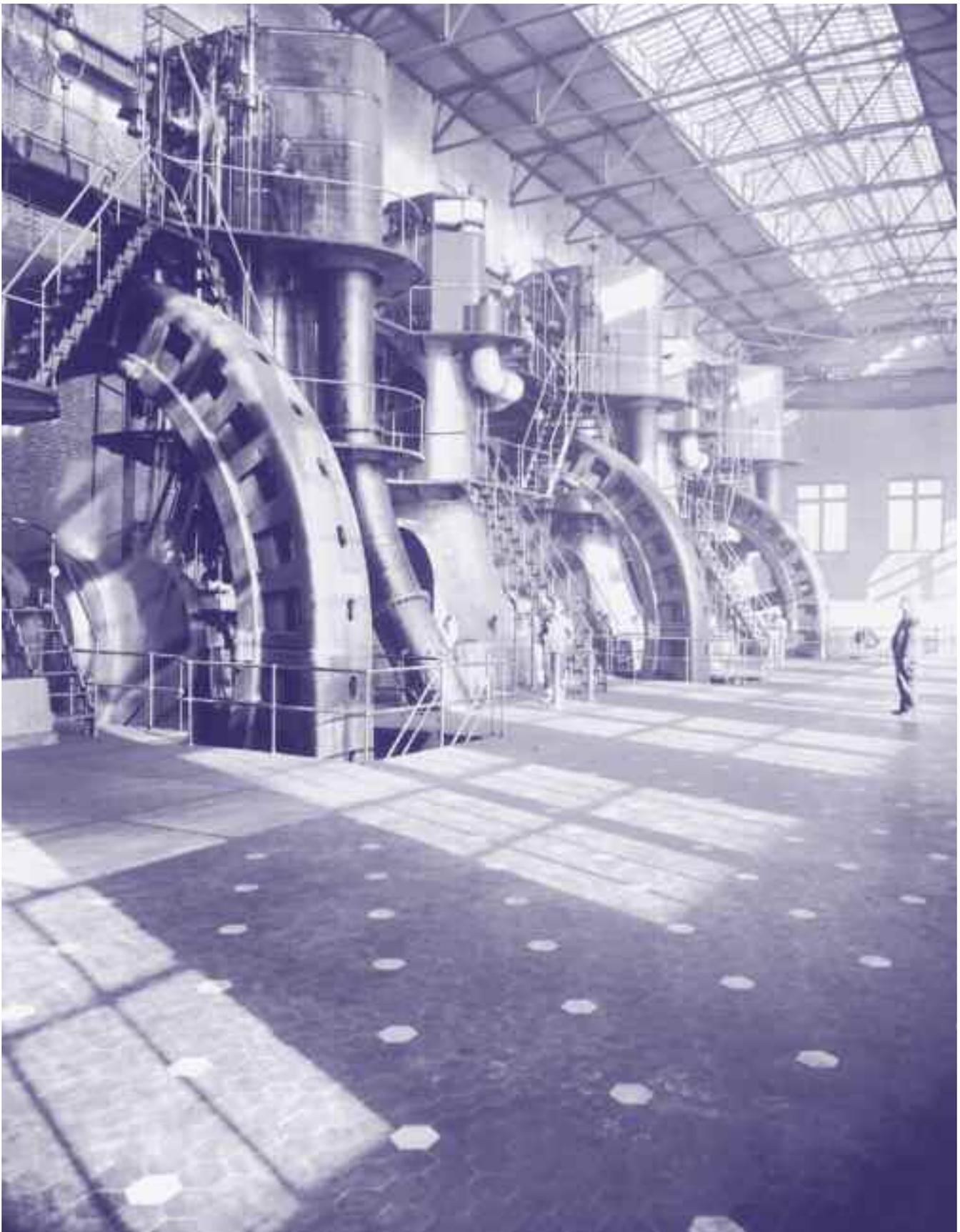
Flour milling had given the falls a much different feel than lumber milling. Stately buildings of limestone and brick supplanted the hastily built, fire-prone sawmills, replacing the image of a frontier boomtown with an air of permanency and modernity. The ramshackle lumber sluiceways disappeared. The falls itself became more rigidly defined. Rather than running through and between the row mills and over the falls' edge, water dropped unseen through turbine shafts and exited through the canals along the river's banks. But other changes had taken place as well.

TWO YEARS AFTER ST. ANTHONY FALLS became the country's leading flour producer in 1880, it achieved national recognition in another way: it gave birth to a new power source—electricity. Electricity would extend the falls' power well beyond the cataract. Businesses at the falls had been using electricity even before they had access to hydroelectric power: In 1881 the Pillsbury A Mill purchased an electric power plant and installed lights, possibly becoming the first mill in the world to do so.³² But large-scale hydroelectric generation from the falls would soon replace individual plants.

In 1881 William Washburn, Joel Bassett, Sumner Farnham, and James Lovejoy joined Otis A. Pray, Loren Fletcher, and C. M. Loring to found a firm soon known as Minnesota Brush Electric Company. It acquired land on Upton Island, built a small central power station, and installed five Brush arc-light generators with lines to businesses on Washington Avenue. On the evening of September 5, 1882, the company lit them with electricity generated by the first hydroelectric-power central station in the United States. By the end of 1885, 232 electric street lamps glowed in Minneapolis.³³

Locally, Minnesota Brush Electric demonstrated the potential of hydroelectricity. A dozen years later the Niagara Falls power plant went on line to show that hydroelectricity had truly come of age. By the turn of the century, companies had perfected their ability to transmit electricity over long distances, spurring construction of more plants.³⁴

St. Anthony Falls stayed at the forefront of hydroelectric power. In 1894 Minneapolis General Electric Company started constructing its Main Street Station



Generating room of the Minneapolis General Electric Company's Main Street Station, about 1910. The east-falls plant, built in 1894-95, generated electricity from steam and from extra waterpower that became available after sawmills moved upstream.

between the east bank and Hennepin Island. Then, in 1895, William de la Barre began building the Lower Dam and Hydro Plant.³⁵

De la Barre, who had come to Minneapolis in 1878, joined Minneapolis Mill in 1883. Using the falls to its maximum potential became his mission. First, he increased waterpower over Franklin Steele's original dam by raising its height and extending the length of the tailraces, thereby raising the head, or distance the water fell, from 8 feet to 45 feet. Then he devoted himself to increasing hydroelectric power by positioning the lower dam hydro plant about 2,200 feet below the falls. Critics branded the dam "De la Barre's Folly," but upon its completion in 1897, Charles Pillsbury praised it as one of the century's greatest engineering accomplishments. The new power station provided electricity to the streetcars of the Twin City Rapid Transit Company.

Finally, recognizing that more of the upper falls flow could be used to generate hydroelectric power, de la Barre convinced Pillsbury-Washburn to let him build a plant on Hennepin Island near the Main Street Station.

When this plant was completed in 1908, de la Barre had succeeded in increasing the working capacity of turbines at the falls from 13,000 horsepower in the 1880s to 55,068 horsepower.

De la Barre's dam recast the river's landscape below St. Anthony Falls. The lower reservoir permanently inundated the rapids where bass once struggled to reach the falls. Only at high flows could the river and falls still attain a restrained majesty.

SINCE THE 1850s, MINNEAPOLIS HAD dreamed of becoming the head of Mississippi River navigation, but the steep gorge and massive limestone boulders left by the falls' retreat had prevented that. Through the late-nineteenth and early-twentieth centuries, Minneapolitans watched as the Corps of Engineers navigation improvements benefited St. Paul. Then, in 1930, the Corps completed Lock and Dam No. 2 at Hastings, and Congress authorized the 9-foot-channel project, which called for building locks and dams from Red Wing to St. Louis.³⁶

The Upper Lock, begun in 1949 and completed in 1963, extended navigation more than four miles above the falls. Shown in 1976, it is taking in coal barges and a tow boat.



Navigation advocates in Minneapolis recognized that construction of two additional locks and dams would permit traffic above St. Anthony Falls and truly make their city the head of navigation. With insistent lobbying by Minnesota Senator Henrik Shipstead, they pushed to have the channel project extended upstream. In August 1937 Congress granted their wish by enacting the Upper Minneapolis Harbor Development Project, for which Minneapolis would contribute \$1,744,000.³⁷

The project called for building a lower lock and dam and an upper lock, for dredging a 9-foot-deep, 150-foot-wide channel, and for modifying bridges and utilities. It would extend the channel 4.6 miles above the Washington Avenue terminal to the Canadian Pacific Railroad bridge. Because of the area's fragile geology and the density of urban development, the Corps devised an innovative design and unique construction methods. World War II, complex economic and engineering studies, and land acquisition delayed construction until 1948, when the Corps began dredging. It replaced de la Barre's lower dam with a new one tied into the old hydro plant and, after delays caused by foundation problems and floods, the lower lock and dam opened in 1956.³⁸

Meanwhile, in 1949, the Corps had broken ground for work on the upper lock. On September 21, 1963, the towboat *Savage*, pushing a barge loaded with cast-iron pipe, became the first to pass through the lock, fulfilling a century-old dream. Barges and tows could now move from the heart of Minneapolis to the Gulf of Mexico. At 49.2 feet, this lock has the highest lift of any on the Mississippi River. Nearly 300 years after Hennepin had estimated the falls' height at 50 feet, his calculation was finally accurate.³⁹

The Upper Harbor Project locks and dams completed the final transformation of St. Anthony Falls. An engi-

neering marvel, the upper lock obliterated Upton Island, the site of the first hydroelectric plant and the west-side row mills. It also removed Spirit Island, where eagles had once nested. To allow modern barges and towboats to move above the falls, the Corps replaced one section of the Stone Arch Bridge with a steel truss. With the west-side mills largely gone or using electricity, the Corps filled in the waterpower canal that had propelled St. Anthony to international flour-milling fame. The lock is now a dominant feature on the west bank.

FROM ANCIENT TIMES TO THE PRESENT, 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. While the cataract is still important for energy, visitors are now returning to admire its power as they did centuries earlier. Recognizing St. Anthony's role in local, regional, and national history, government agencies are focusing attention and funding on the falls. The Minneapolis Park and Recreation Board has created Mill Ruins Park and removed the fill placed in the west-side waterpower canal to reveal the archaeological remains of the old tailraces. The Minnesota Historical Society's Mill City Museum in the ruins of the Washburn A Mill will explore St. Anthony's influence on the region's history. Private interests are working to establish a kayaking course that would capture the approximate 26-foot drop and provide a whitewater experience on the river. The National Park Service's Mississippi National River and Recreation Area, a partner in many of these activities, will help integrate the St. Anthony story with the broader history of the metropolitan river. Together, these activities will help restore St. Anthony Falls' renown as a geologic marvel and a geographic anchor to the city it built. ❖

Notes

1. Here and below, Louis Hennepin, *Father Louis Hennepin's Description of Louisiana, Newly Discovered to the Southwest of New France by Order of the King*, trans. Marion E. Cross (Minneapolis: University of Minnesota Press, 1938), 90, 94, 104, 114, 117; Louis Hennepin, *A Description of Louisiana*, trans. John G. Shea (1880; reprint, Ann Arbor: University Microfilms, 1966), 220; William W. Folwell, *A History of Minnesota* (1956; reprint, St. Paul: Minnesota Historical Society, 1979), 1: 27–30; William E. Lass, *Minnesota, A History* (1977; rev. ed., New York: W. W.

Norton, 1998), 59–60. This article is based on an historic-resources study of the 72-mile Mississippi National River and Recreation Area, a unit of the National Park Service.

2. Archaeological sites associated with the falls may exist along the entire route of its upstream migration; Scott F. Anfinson, *Archaeology of the Central Minneapolis Riverfront*, pt. 1, *Minnesota Archaeologist* 48 (1989): 17–20.

3. S. Anfinson, *Archaeology of the Riverfront*, 19; Lucile M. Kane, *The Falls of St. Anthony: The Waterfall that Built Minne-*

apolis (1966; rev. ed., St. Paul: Minnesota Historical Society Press, 1987), 2; David Wiggins, program mgr., St. Anthony Falls Heritage Zone, personal communication, Apr. 27, 2000.

4. Hennepin, *Description of Louisiana*, trans. Cross, 117.

5. Henry R. Schoolcraft, *Travels through the Northwestern Regions of the United States* (1821; reprint, Ann Arbor: University Microfilms, 1966), 291.

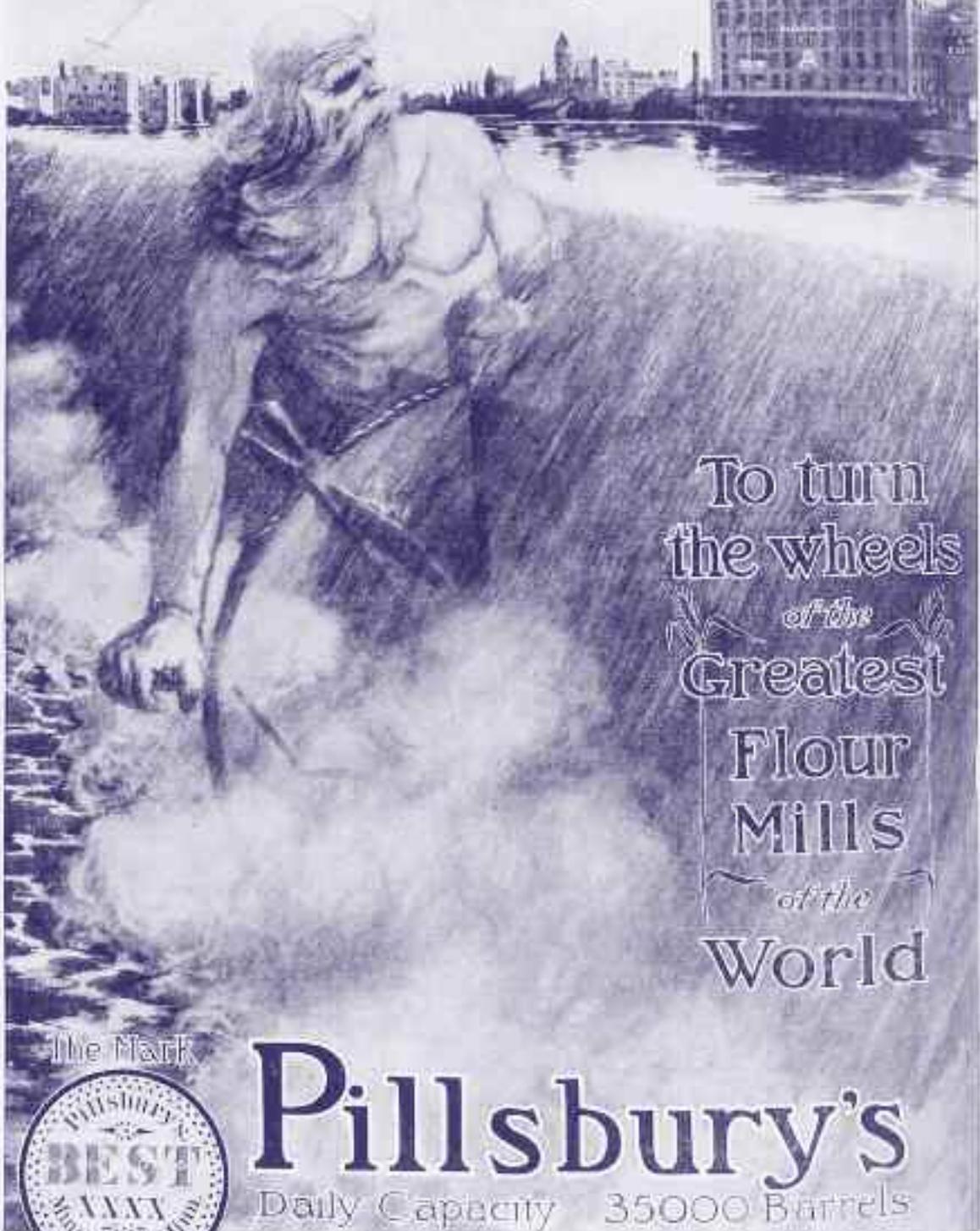
6. S. Anfinson, *Archaeology of the Riverfront*, 19–20, 21.

7. Hennepin, *Description of Louisiana*,

- trans. Cross, 90, and Hennepin, *A Description*, trans. Shea, 200, give the figures 40-to-50 feet. Hennepin, in *New Discovery of a Vast Country in America*, ed. Reuben G. Thwaites (Chicago: A. C. McClurg, 1903), 223, gives the figures 50–60 feet. See also, “Relation of M. Pénicaut,” trans. A. J. Hill, in *Minnesota Historical Society Collections* 3 (St. Paul, 1880): 6; *The Journals of Jonathan Carver and Related Documents, 1766–1770*, ed. John Parker (St. Paul: Minnesota Historical Society Press, 1976), 93; Kane, *Falls of St. Anthony*, 5.
8. Jonathan Carver, *Travels through the Interior Parts of North America in the Years 1766, 1767, and 1768* (3rd ed., 1781; reprint, Minneapolis: Ross and Haines, 1956), 93; Stephen H. Long, “Voyage in a Six-Oared Skiff to the Falls of Saint Anthony in 1817,” in *Minnesota Historical Society Collections* 2 (St. Paul, 1889): 35–36.
9. Parker, *Carver*, 93; Schoolcraft, *Travels*, 290.
10. Kane, *Falls of St. Anthony*, 3; George W. Featherstonhaugh, *A Canoe Voyage Up the Minnaw Sotor* (St. Paul: Minnesota Historical Society, 1970), 1: 253–54.
11. Here and six paragraphs below, Kane, *Falls of St. Anthony*, 13–16, 18, 26–27, 31–32.
12. Gary C. Anderson, *Kinsmen of Another Kind: Dakota-White Relations in the Upper Mississippi Valley, 1650–1862* (St. Paul: Minnesota Historical Society Press, 1997), 184–89; Kane, *Falls of St. Anthony*, 34–38.
13. Kane, *Falls of St. Anthony*, 37, 42, 44, 49–51.
14. Kane, *Falls of St. Anthony*, 43; Scott F. Anfinson, “Minnesota Waterpower Canal: History, Archaeology, and Interpretive Potential,” in *Canals and American Cities*, ed. Ronald C. Carlisle (Easton, PA: Canal History and Technology Press, 1994), 19; Merlin H. Berg, “Abstract of Available Historical Data on St. Anthony Falls” (St. Paul District, Corps of Engineers Records, ca. 1939), 3, St. Paul District Office.
15. Kane, *Falls of St. Anthony*, 53–54. The company lengthened the canal to 600 feet in the mid-1860s and to 950 feet in the mid-1890s. It created a head of about 35 feet and “turned a six-block riverfront strip into the country’s most densely industrialized, direct-drive waterpower district”; see Jeffrey A. Hess and Scott Anfinson, St. Anthony Falls (SAF) Historic District, National Register of Historic Places, nomination continuation form, 1991, p. 8–4, State Historic Preservation Office (SHPO), Minnesota Historical Society, St. Paul; S. Anfinson, “Waterpower Canal,” 19–20.
16. Kane, *Falls of St. Anthony*, 57, 58, 106.
17. Berg, “Abstract,” 3–4.
18. Kane, *Falls of St. Anthony*, 71, 72; *St. Paul Daily Press*, Oct. 6, 1869.
19. Berg, “Abstract,” 4–5; Jane L. Carroll, *Engineering the Falls: The Corps of Engineers’ Role at St. Anthony Falls* (St. Paul: District Corps of Engineers, n.d.), 11.
20. Here and two paragraphs below, Berg, “Abstract,” 4–8, 10; Carroll, *Engineering*, 16–17.
21. Berg, “Abstract,” 16–18; Kane, *Falls of St. Anthony*, 63–64; Carroll, *Engineering*, 11–17. The Minneapolis Mill Company had begun an apron in 1866, but a flood ripped it apart the next June.
22. Kane, *Falls of St. Anthony*, 106, 107; Scott Anfinson, personal communication, Apr. 2000. From 1899 to 1905, the steam-powered mills of north Minneapolis made the city the nation’s leading sawmilling center, but lumber production soon declined; see Kane, *Falls of St. Anthony*, 108, 115, 125.
23. S. Anfinson, *Archaeology of the Riverfront* 48: 26, 28; Kane, *Falls of St. Anthony*, 107–08, 122.
24. Donald B. Dodd and Wynelle S. Dodd, *Historical Statistics of the United States, 1790–1970*, vol. 2, *The Midwest* (Tuscaloosa: University of Alabama Press, 1973), 24–25.
25. S. Anfinson, *Archaeology of the Riverfront*, 24; Kane, *Falls of St. Anthony*, 59, 99–101.
26. Kane, *Falls of St. Anthony*, 99.
27. Dodd and Dodd, *Historical Statistics*, 24–25; Kane, *Falls of St. Anthony*, 98–99, 101–04, 113.
28. Kane, *Falls of St. Anthony*, 86, 104, 105, 123; Hess and Anfinson, SAF National Register nomination continuation form, p. 8–8.
29. Kane, *Falls of St. Anthony*, 86, 87, 116, 123, 147.
30. Here and below, Kane, *Falls of St. Anthony*, 98–99, 115, 150–151, 172–173; Hess and Anfinson, SAF National Register nomination continuation form, p. 8–6, 8–7.
31. S. Anfinson, *Archaeology of the Riverfront*, 29; Hess and Anfinson, SAF National Register nomination continuation form, p. 7–3, 8–7, 8–9; Kane, *Falls of St. Anthony*, 173.
32. Kane, *Falls of St. Anthony*, 135.
33. Kane, *Falls of St. Anthony*, 134–37, 140–41.
34. Philip V. Scarpino, *Great River, An Environmental History of the Upper Mississippi, 1890–1950* (Columbia: University of Missouri Press, 1985), 22.
35. Here and two paragraphs below, Kane, *Falls of St. Anthony*, 117, 149, 151–57, 165, 171–72. The Corps of Engineers removed the lower dam when it built Lower St. Anthony Lock and Dam in the early 1950s, and the station collapsed in 1987 after the river undermined its foundation.
36. Lucile M. Kane, “Rivalry for a River: The Twin Cities and the Mississippi,” *Minnesota History* 37 (Dec. 1961): 310–11; John O. Anfinson, “The Secret History of the Mississippi’s Earliest Locks and Dams,” *Minnesota History* 54 (Summer 1995): 254–67.
37. Raymond H. Merritt, *Creativity, Conflict and Controversy: A History of the St. Paul District, U. S. Army Corps of Engineers* (Washington D.C.: GPO, 1979), 148; Berg, “Abstract,” 21.
38. Clarence Buending, “A Review of the Construction of the St. Anthony Falls Project,” 2, 8, historical files, 1962, St. Paul District, Corps of Engineers; Francis Mullen, “The St. Anthony Falls Navigation Project,” *Proceedings of the American Society of Civil Engineers* 89 (Mar. 1963): 4, 6, 8, 10–11; Martin Nelson, “Nine-foot Channel Extension Above St. Anthony Falls,” *Minnesota Engineer*, June 1960, p. 7–9; “Flooding and Untimely Thaws Test Contractors’ Mettle on River Job,” *Construction Bulletin*, Mar. 6, 1952, p. 36–41; Merritt, *Creativity*, 148.
39. Kane, *Falls of St. Anthony*, 154, 174–76; Buending, “Review of the Construction,” 1–8; Mullen, “St. Anthony Falls Navigation Project,” 1–18; Nelson, “Nine-Foot Channel Extension,” 6–9.

The falls photo on page 253 is by Whitney and Zimmerman; apron by Zimmerman; Stone Arch Bridge by Hibbard; Upper Lock by Steve Plattner. All the images, including the ad (right) from the March 16, 1912, issue of Bellman, are from the MHS collections.

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St. Anthony Falls, an icon that represented Minneapolis to the world, featured in a magazine advertisement



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