

# *Mills Machines and Millers* Minnesota Sources for Flour-Milling Research

By Robert M. Frame III

MAY 2, 1978, marked the 100th anniversary of the famous Washburn Mill explosion, a blast that leveled five Minneapolis mills, killing eighteen men and making headlines in newspapers of New York City and other cities.<sup>1</sup> The mill-rebuilding process began almost before the dust had settled and signaled Minnesota's emergence as a major contender for supremacy in the international flour-milling industry. From the end of the 1870s through the 1880s the entire state embarked on an ambitious mill building and remodeling campaign. The whirlwind of record-breaking activity resulted in giant mills, ever-increasing production capacities, and endless railroad trains of incoming grain and outgoing flour shipments. Perhaps now is the time, during observance of the anniversaries of the milling events of a hundred years ago, to reconsider the flour-milling heritage of Minnesota.

From the 1880s through the 1930s Minnesota was the flour-milling capital of the world. Today the once powerful image of that half-century industrial role is slowly vanishing from the collective memory of the state's citizens. Fewer and fewer people in Minnesota remember that the call letters of WCCO radio were taken from the

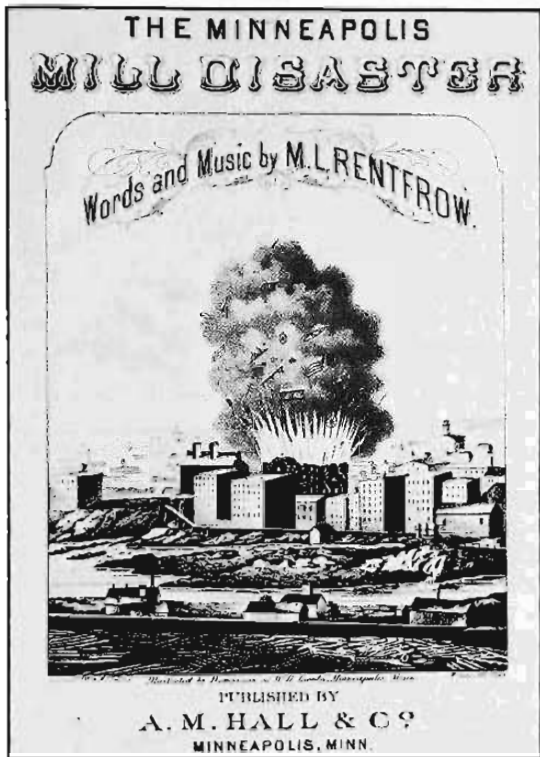
name of the station's creator and one of Minnesota's most famous milling firms, the Washburn-Crosby Company. Fewer and fewer people remember that Minneapolis once had a baseball team called the Millers. St. Anthony Falls in Minneapolis no longer is advertised as the site of the greatest flour mills in the world, and many of the famous millers who founded these mills are known only by the streets and schools that bear their names. To a visiting journalist of eighty years ago Minneapolis was synonymous with flour milling. Today, national magazines featuring articles on Minnesota fail to mention flour milling even in passing.<sup>2</sup>

The mills themselves are almost all gone. Of the more than twenty flour mills that once formed a tight knot of furious activity at the falls — mills with stone and brick walls several feet thick, then thought strong enough to last many lifetimes — only five remain. The great canal which supplied water to Minneapolis' west-side milling district was closed in 1960 and soon replaced by the present lock and dam. Flour milling in the famous Washburn A Mill ceased in 1965, and milling in the landmark Pills-

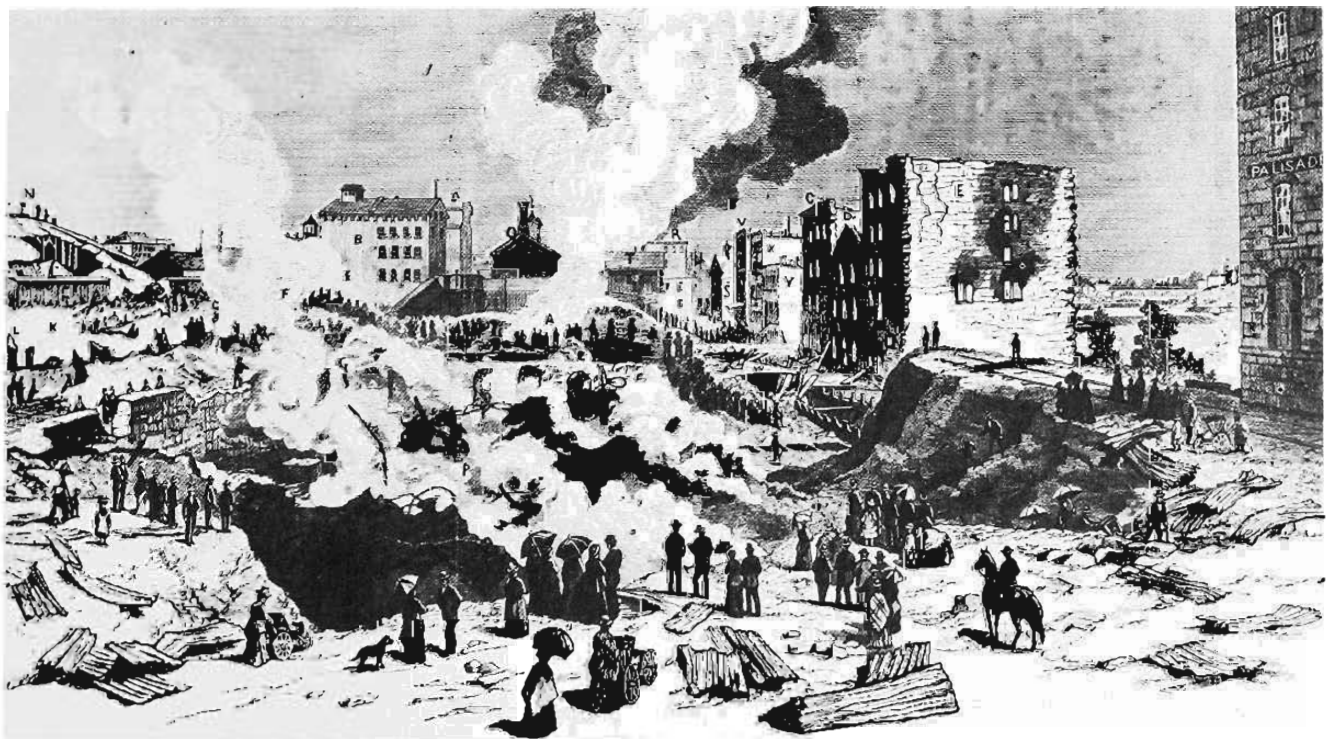
*Mr. Frame, research historian with the Minnesota Historical Society's state historic preservation office, is the author of Millers to the World: Minnesota's Nineteenth Century Water Power Flour Mills, a report printed in 1977 by the society's field services, historic sites, and archaeology division. He is now writing a Ph.D. thesis on flour milling in Minnesota for the University of Minnesota American Studies program and is a director of the Society for Industrial Archaeology.*

<sup>1</sup> Lucile M. Kane, *The Waterfall that Built a City: The Falls of St. Anthony in Minneapolis*, 102 (St. Paul, 1966).

<sup>2</sup> Charles F. Sarjeant, ed., *The First Forty: The Story of WCCO Radio*, 69-71 (Minneapolis, 1964). For an example of a nineteenth-century article, see "The Flour Mills of Minneapolis," in *Leslie's Illustrated Newspaper*, 64:123, 125 (April 9, 1887). For examples of recent national articles neglecting milling, see "Minnesota: A State That Works," in *Time*, August 13, 1973, p. 24-35, and "Minnesota: Where Water Is the Magic Word," in *National Geographic*, February, 1976, p. 200-229.



*"THE CRASH it came like quick'ning Thunder, Which caused brave men to stare with wonder, As the Mills like bubbles burst asunder, Crumbling to the ground." With these words Milton L. Rentfrow described the May, 1878, Minneapolis mill explosion in his song published later that year. Above (right) and below are views of the rubble after the disaster. The letter A in the picture below marks the site of the Washburn A Mill where the explosion originated.*





bury A Mill, directly across the river, has receded to a tiny corner of the giant building which once was the world's largest single flour mill. Elsewhere in the state the number of nineteenth-century flour-mill buildings has shrunk to a few dozen, all that remain of the 512 mills the United States Census reported in 1900.<sup>3</sup>

Despite Minnesota's unrivaled position in the development of flour milling, there has been very little historical study of the subject, especially in comparison with the ever-growing bibliography of works on lumbering and mining. And despite the seemingly universal romantic appeal of old mills, there have been relatively few amateur mill buffs in Minnesota. Needless to say, this may relate to the paucity of picturesque old mills in the state. With their advanced technology, their metal turbines and rollers, Minnesota's factory-like mills hardly seem attractive enough in the traditional sense to compare with those farther east where the Society for the Preservation of Old Mills, the only national grist-mill history organization in the United States, is headquartered. Yet, even the scholarly International Molinological Society, based in The Netherlands, seems to know little of the history of Minnesota milling.<sup>4</sup>

Nevertheless, when the few major works on milling in America have been written, they have had close ties to Minnesota. The first serious study of American flour milling was drafted as a Ph.D. thesis at the University of Minnesota by Charles B. Kuhlmann. Published in 1929, Kuhlmann's prize-winning book, *The Development of the Flour-Milling Industry in the United States*, emphasizes economic aspects of flour-mill history.<sup>5</sup>

The second of the only two American milling histories has a curious background. In 1945 General Mills seriously considered establishing a Museum of Milling History at its Minneapolis headquarters. The project was

abandoned, but two of its participants, historian John Storck and industrial designer Walter Dorwin Teague, collaborated on what has remained the definitive technological history of flour milling and the only remnant of the museum project. Their study, *Flour for Man's Bread: A History of Milling*, was published by the University of Minnesota Press in 1952. Lucile M. Kane's *The Waterfall that Built a City: The Falls of St. Anthony in Minneapolis*, published in 1966 by the Minnesota Historical Society, records the rise and decline of the Minneapolis water-power mills in an urban-historical context.<sup>6</sup>

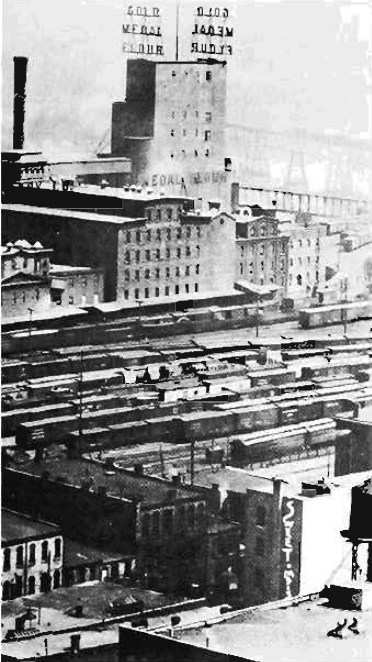
Still, there remains a rich lode of untapped resources in the history of flour milling, much of which has been quietly residing in the collections of the Minnesota Historical Society, virtually untouched by researchers. The single greatest source for any study of flour milling in Minnesota is the *Northwestern Miller*. This was a weekly tabloid trade journal and all-purpose newspaper for millers that ceased publication in 1973 on its 100th anniversary, although its owner, Miller Publishing Company,

<sup>3</sup>Robert M. Frame III, *Millers to the World: Minnesota's Nineteenth Century Water Power Flour Mills*, 93-145 (St. Paul, 1977); Lucile M. Kane, "Foundations of a City," in *Minnesota History News*, December, 1960, p. 1; *United States Census*, 1900, *Manufactures*, vol. 9, part 3, p. 358.

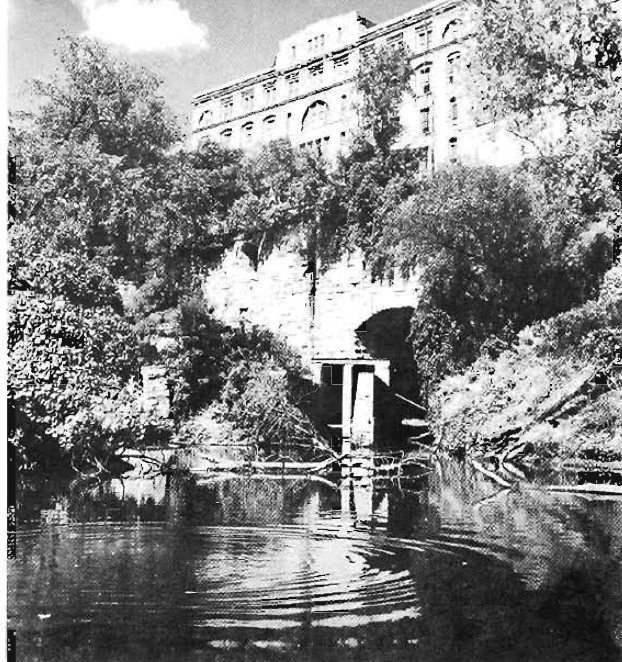
<sup>4</sup>For information about the Society for the Preservation of Old Mills, contact the president, P.O. Box 435, Wiscasset, Maine 04578. For information about the International Molinological Society, contact J. Kenneth Major, membership secretary, 2 Eldon Road, Reading, RG1 4DH, England.

<sup>5</sup>Charles B. Kuhlmann, *The Development of the Flour-Milling Industry in the United States With Special Reference to the Industry in Minneapolis* (Boston, 1929).

<sup>6</sup>John Storck and Walter Dorwin Teague, *Flour for Man's Bread: A History of Milling*, v (Minneapolis, 1952).



THE MINNEAPOLIS flour milling industry was reaching the peak of its prosperity when this panorama (made up of two separate views taken by the same photographer) of the west-side milling district was taken in 1908. Visible across the river in the distance at far left and in the present-day view at right is the still functioning Pillsbury A Mill.



remains active. By the 1890s the *Northwestern Miller*, despite numerous competitors, had established itself as the world's most important milling periodical and as one of the finest trade journals of any kind published around the turn of the century.

The *Northwestern Miller* originated in La Crosse, Wisconsin, at a time when it was thought that La Crosse might emerge as a flour-milling center.<sup>7</sup> Amasa K. Osterlander, a journalist, combined talents with Albert Hoppin, a machinist working for a firm making a mechanical millstone grinder or "dresser." Together they designed the *Northwestern Miller* to function as an advertising vehicle for their machine. Before long journalism overtook manufacturing, milling geography changed, and in 1879 the *Miller* moved to Minneapolis, where young William C. Edgar soon was hired as business manager. The marriage of Edgar and the *Miller* was to be an event of profound significance for both.<sup>8</sup>

A born writer and raconteur, Edgar was not about to let himself be reduced to the level of mere management and uninspired technical journalism. Single-handedly, he raised the content and graphic quality of the *North-*

*western Miller* to the point where the annual Christmas "holiday number," packed with quality writing and art, achieved international artistic and literary acclaim.

The papers of Edgar are filled with correspondence from the renowned writers and artists of his day, many of whom he commissioned to prepare works for the *Miller*. Stories by such writers as Hamlin Garland, O. Henry, and Frank R. Stockton were illustrated by Howard Pyle, Frank X. Leyendecker, Frederic Remington, and others. Mark Twain once wrote to Edgar: "I have in my mind a small yarn wherein a western flouring mill figures rather picturesquely, & if I can put it on paper in a way to satisfy me you can have it for five hundred dollars if you like. I can't undertake to furnish it to you, I can only undertake to *try*." Twain's story has never been located in the pages of the *Northwestern Miller*, and no literary manuscripts have survived in Edgar's papers.<sup>9</sup>

Through his journal Edgar became the voice of Minnesota flour milling which at that time meant "progressive" milling. "It cannot be successfully denied," he wrote in 1892, "that an American mill properly located, equipped according to modern ideas of mill building, and operated with skill and intelligence can outstrip that of any other country on the face of the earth in the production of a wholesome flour at the very lowest cost." Low-cost mass production was the ideology of big-city progressive milling.<sup>10</sup>

Edgar's archrival was the *American Miller*, a competing journal published in Chicago and founded the same year as the *Northwestern Miller* (1873). Unlike that of Edgar's publication, the *American Miller's* audience was composed of smaller, more rural millers who were, Edgar once sniffed, "the few followers of the old method of milling, as moss-grown, out of date, and decrepit as the crumbling and neglected mills they owned." Writing

<sup>7</sup> For a discussion of the decline of outlying regional milling centers relative to the rise of Minneapolis' dominance of the industry, see Charles N. Claab and Lawrence H. Larsen, "Neenah-Menasha in the 1870's: The Development of Flour Milling and Papermaking," in *Wisconsin Magazine of History*, 52:19-34 (Autumn, 1968).

<sup>8</sup> "Northwestern Miller to Celebrate 85th Birthday," in *Greater Minneapolis*, publication of the Minneapolis Chamber of Commerce, January, 1958, p. 86-88, 93.

<sup>9</sup> Samuel L. Clemens to William C. Edgar, May 8, no year, photocopy in Edgar Papers, in the Minnesota Historical Society; original owned by the Minneapolis Public Library.

<sup>10</sup> Edgar, "The Miller and His Mill," in *Chautauquan*, 16:169 (November, 1892).

in his favorite poetic form, doggerel, under the pen name of "The Lusty Lyre," Edgar good-humoredly hammered away at the backward and unprogressive *American Miller*:

A miller whose back was of moss  
Said, "The 'Merican Miller's the boss.  
When it's read upside down  
It's as good. I'll be boun';  
'Twixt either side up it's a toss."<sup>11</sup>

Progressive milling generally implied big-business milling, and captains of the progressive Minnesota milling industry were, as Edgar once put it, "men of affairs." Such a person was likely to be "a manufacturer of flour and a dweller in cities," one who studied "international and not neighborhood conditions." The cosmopolitanism of milling magnates such as the Pillsburys and William Hood Dunwoody, for example, is reflected in their personal papers in the society's collections. In the Pillsbury Papers the flour-milling industry can be found intertwined with lumbering, real estate, mining, politics, and the University of Minnesota, through the many enterprises of John S. Pillsbury, his brother George A., and nephew Charles A. In the Dunwoody Papers is information on milling's international connection — exports to England, mills in Budapest, and foreign competition — along with Dunwoody's far-flung and diverse economic investments, such as gold in Alaska and gas and electric development in Seattle.<sup>12</sup>

THE TECHNOLOGICAL SIDE of the development of flour milling also is well represented in the society's manuscript and library collections, although, like the literary aspects of Edgar, it has been little studied. Of great significance here are the papers of millwright-engineers Otis A. Pray and William de la Barre. Again, however, not to be missed are the pages of the *Northwestern Miller*, which not only spread the word about each new machine and technique but noted in detail when, where, and by whom these advances were used.

The lives of Otis A. Pray and William de la Barre, like many of the significant Minnesota milling figures, are success stories directly linked with the dramatic rise of Minnesota milling. Pray arrived in territorial Minnesota from his native Maine under conditions so primitive that when his steam packet sank on the way upriver to St. Paul he simply walked the rest of the way, casually noting in his diary for April 22, 1857, merely that the day had been "Pleasant" and "the Tide and Times [steam packet] had a hole stove in her side she sank 12 miles below St. Paul. I came on foot to the City I took the stage to Minneapolis." Within twenty years of this inauspicious arrival, Pray had become successful enough to be owner of Pray Manufacturing Company, one of Minneapolis' major mill-furnishing firms. By 1887, when the firm went bankrupt, his career had touched some of the

most significant events in Minnesota milling history.<sup>13</sup>

Of profound importance to the revolutionary technological changes occurring in milling was the invention in Minnesota around 1870 of the middlings purifier. This machine allowed millers to grind the northern-grown hard spring wheat by successfully separating out such "impurities" as bran dust and wheat germ, thus leaving a "pure" white flour which was desired by consumers of the time.<sup>14</sup>

The identity of the purifier's true inventor became a matter of much dispute in the 1870s, since the person who controlled the patent controlled a significant industry in purifier manufacturing. The main parties were the La Croix brothers, Nicholas and Edmund, and George T. Smith. Smith eventually obtained the patent and was vindicated by the United States Patent Office, although William C. Edgar thought him an evil man of "underhanded cunning" for stealing the invention from the La Croix brothers. As it happened, Otis A. Pray furnished the iron work for the La Croix machine but, upon discovering that Smith was moving more quickly and successfully in the patent process, dropped the La Croix venture and bought a half interest in the Smith patents, copies of which can be found in his papers.<sup>15</sup>

The major parties in the dispute, which grew into what became known as the "purifier war," appear in person in a fascinating but virtually unknown series of printed volumes of legal actions. The result of patent lawsuits, these proceedings contain the transcript testimony of those who witnessed and participated in a major event in the development of flour milling.<sup>16</sup>

Pray also was involved in much of the significant mill construction at St. Anthony Falls. In 1859, only two years after his arrival in Minneapolis, he worked on William W. Eastman's and Paris Gibson's Cataract Mill, the first private mill on the west side of the falls. His papers include his "Time Book," recording his hours spent on the

<sup>11</sup> Storck and Teague, *Flour*, 256: "The Growth of Eight Years," in *American Miller*, 9:91 (March 1, 1881). Edgar, in *Chautauquan*, 16:170; poem from clipping in William C. Edgar Scrapbook, circa 1880-96, in Edgar Papers.

<sup>12</sup> Edgar, in *Chautauquan*, 16:171. See discussion of Minneapolis mill owners in Kane, *Waterfall*, 98-113.

<sup>13</sup> Otis A. Pray Diary, 1857, Pray Papers, "Death of O. A. Pray," in *Northwestern Miller*, 29:310 (March 21, 1890).

<sup>14</sup> The development of the middlings purifier is discussed in detail in Storck and Teague, *Flour*, 196-222.

<sup>15</sup> William C. Edgar, *The Story of a Grain of Wheat*, 158 (New York, 1903). "Death of O. A. Pray," in *Northwestern Miller*, 29:310.

<sup>16</sup> American Middlings Purifier Company v. Atlantic Milling Company, United States Circuit Court for the Eastern District of Missouri, and American Middlings Purifier Company v. John A. Christian et al., United States Circuit Court for the District of Minnesota, *Record*, 2 vols., n.d.; Consolidated Middlings Purifier Company v. LaCroix Middlings Purifier Company, United States Circuit Court for the District of In-

construction. By the 1880s he had expanded into the Pray Manufacturing Company which occupied a full block along First Street South where he turned out equipment for Minnesota mills, including the great Pillsbury A Mill in 1881. When Pray died in 1890 the *Northwestern Miller* eulogized: "He participated in the upbuilding of his city and . . . saw it develop from a mere village to its present proportions."<sup>17</sup>

Mill machinery also was responsible for the presence of William de la Barre in Minnesota, and his papers are another significant source of flour-mill information. Unlike the self-taught Pray, de la Barre was educated at the Vienna Polytechnic College in Austria. In 1878, while working as an engineer in Philadelphia, he was engaged by Cadwallader C. Washburn to install the Behrns Millstone Exhaust in the new Washburn A Mill. This was a device designed to reduce the flour dust in mills and prevent a repeat of the great explosion of the same year. As a result of this involvement, de la Barre's papers contain significant documentation about the equipment and design of the Washburn A Mill. De la Barre's presence as an engineer reflects the increased sophistication of the milling industry and the need for considerable technical expertise. He went on to become a consequential figure in the complex development of the water power at St. Anthony Falls.<sup>18</sup>

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diana, no title, 2 vols., n.d. The Minnesota Historical Society has copies of both sets of volumes. For details of the "purifier war," see William D. Gray, "A Quarter-Century of Milling," parts 3-6, in *Northwestern Miller*, 48:843-844 (November 1, 1899), 48:899-900 (November 8, 1899), 48:994-996 (November 22, 1899), and 48:1048-1049 (November 29, 1899).

<sup>17</sup>"A Representative Industrial Establishment," in *Northwestern Miller*, 12:397 (December 2, 1881), "Death of O. A. Pray," in *Northwestern Miller*, 29:310.

<sup>18</sup>For a discussion of the life and work of de la Barre, see Kane, *Waterfall*, 117-121; on de la Barre and the Washburn A Mill, see Storck and Teague, *Flour*, 245-251.

<sup>19</sup>Gray and the development of the roller mill are discussed in Storck and Teague, *Flour*, 223-240. Gray's long series of articles appeared under the title of "A Quarter-Century of Milling" in *Northwestern Miller*, beginning October 18, 1899, and ending March 21, 1900.

<sup>20</sup>An 1889 middlings purifier from the George T. Smith Company remains in the Stockton Roller Mill; Frame, *Millers to the World*, 54. The Washburn C Mill is discussed in Storck and Teague, *Flour*, 245-251; demolition date from D. Schaetzl, "Minneapolis Plant History," June 1, 1965, General Mills Archives, General Mills Public Relations Department.

<sup>21</sup>*United States Census, 1890, Manufactures*, vol. 6, part 1, p. 474; Kuhlmann, *Development*, 128. For discussions of prominent outstate millers, see George D. Rogers, "History of Flour Manufacture in Minnesota," in *Minnesota Historical Collections*, 10:35-55, and Paul R. Fossom, "Early Milling in the Cannon River Valley," in *Minnesota History*, 11:271-282 (September, 1930). The Minnesota Historical Society has the papers of several outstate millers, including Henry G. Page and Elmer E. Adams (both of Fergus Falls), Edwin Clark (Melrose), and John M. Allen (Pine City).

In many ways the growth of Minnesota as a world milling center turned on such major technological developments as the purifier and, later, the roller mill, the machine which replaced the ancient millstone. (The term "roller mill" is also used to describe the mill buildings which housed these machines.) The roller mill was first engineered in its modern form by William D. Gray, who was associated with Edward P. Allis and Company (now Allis-Chalmers) of Milwaukee, a major national mill equipment manufacturer. Gray was responsible for the installation in Minnesota mills of some of the nation's earliest roller machinery. Later he wrote a lengthy series of articles on the history of milling technology for the *Northwestern Miller*.<sup>19</sup>

While many of these surviving documents, both manuscript and printed, can tell a great deal of the story, historians of technology have come to realize that in many cases the machine itself is the most important evidence. Tragically, most of the early milling machinery has been lost. Although the first purifiers were built and used in Minnesota, there are none in the society's collections. Nor are there any roller mills, despite knowledge of Gray's Minnesota work. When the world's first all-roller automatic gradual reduction mill, Minneapolis' Washburn C Mill engineered by Gray, was demolished in 1960, no artifacts were acquired.<sup>20</sup>

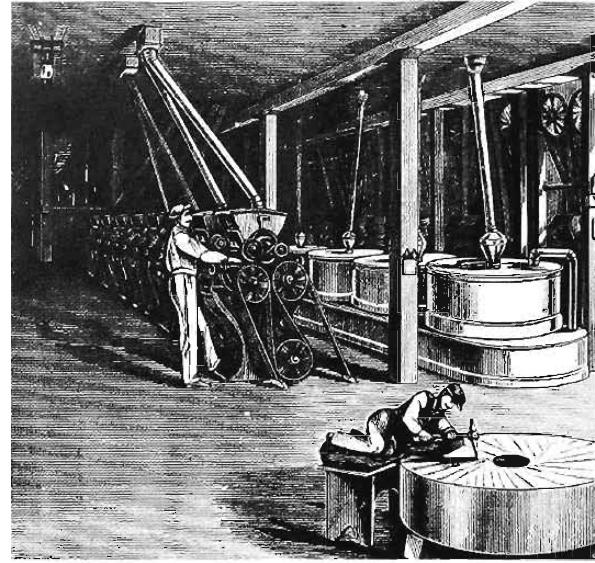
Nor has anyone worked to preserve and record any of the many lesser machines and objects that were invented locally in the 1880s and 1890s when Minnesota millers and millwrights were constantly trying out new ideas and the *Northwestern Miller* reported new Minnesota milling patents practically every week. Today there is scarcely even a wooden flour barrel to be found, although at one time local mills daily filled thousands of the wood barrels built in nearby cooper shops. Some of this equipment still may be found in small mills surviving in rural areas. An attempt should be made to locate and preserve examples of these important Minnesota-related items.

AT TIMES it is easy to think that Minnesota milling really meant only Minneapolis milling, but such was not the case. Milling activity was statewide. Of the 307 mills standing in the state in the 1890s, only twenty-four were in Minneapolis. The early middlings purifier experiments of the La Croix brothers were conducted at their mill in Faribault, and some of the state's most prominent millers were from outside the Twin Cities. Among them were Charles Espenschied, who was known as the "Duke of Hastings" and operated the large Gardner Mill there (now the Peavey Company Mill); John S. Archibald, who was one of many innovative millers in the Cannon River Valley; and Jesse Ames, a prominent Northfield miller whose mill building now houses the Malt-O-Meal Company plant.<sup>21</sup>

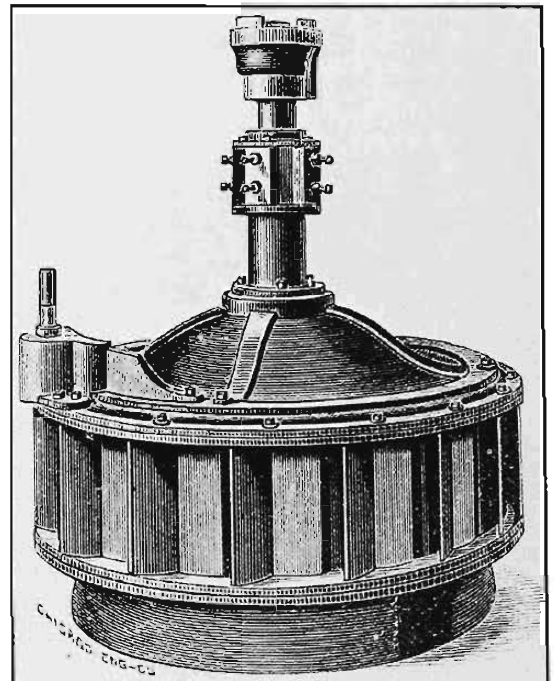
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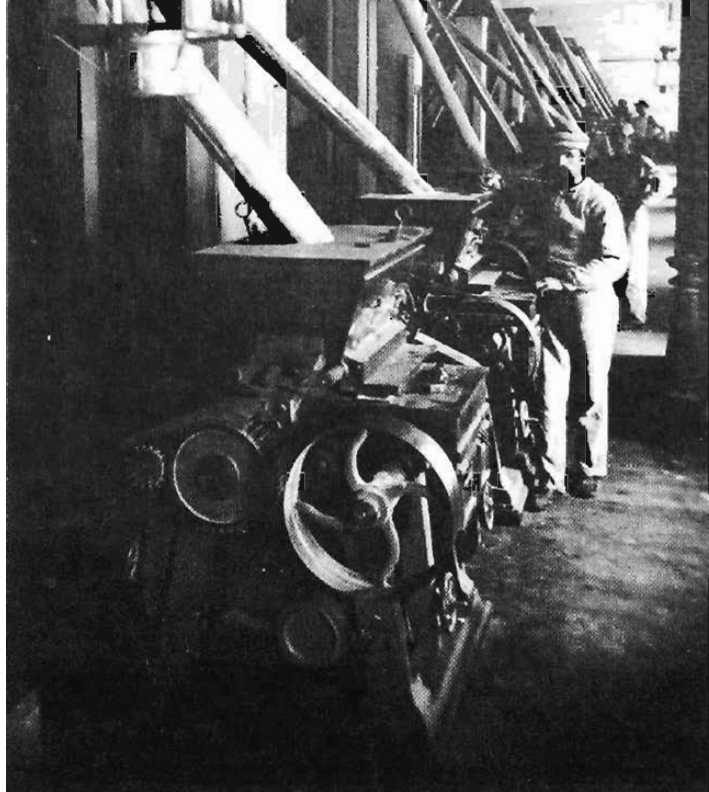
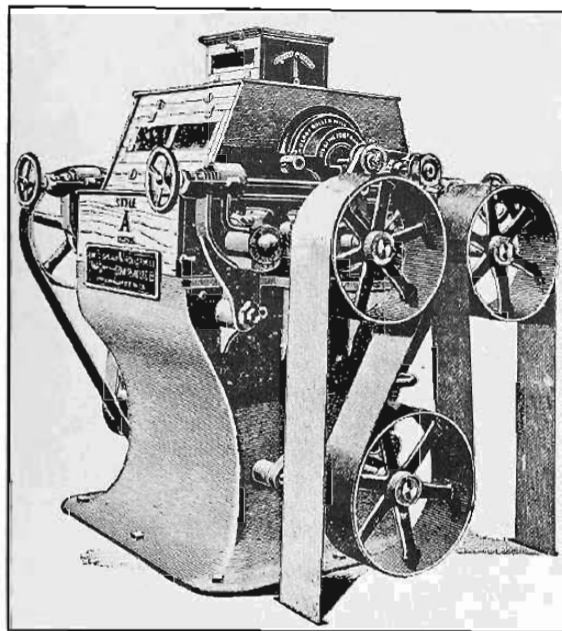


MINNEAPOLIS in the late nineteenth century was in the forefront of technological change in the flour-milling industry. Above, left, a workman in a Minneapolis mill about 1860 "dresses" a millstone (recutting the grooves) while leaning on his "bist" (cushion filled with bran). By the late 1870s millstones were being replaced with roller mills, although some flour mills, such as one in Minneapolis (above, right) retained the older millstones until millers were sure of the new technology. An earlier innovation in milling was the turbine (below, right) which



replaced the old water wheel. The turbine shown below was installed in the Pickwick Mill in Pickwick in the 1870s, where, as pictured (below, left) the old water wheel was "put out to pasture" in the grass beyond the mill's tailrace. The roller mill was first engineered in its modern form (opposite page, top left) by William D. Gray for the Edward P. Allis Company of Milwaukee. Gray helped design the Washburn A Mill in Minneapolis as rebuilt after the disastrous explosion of 1878 (far right). One theory to explain the 1878 explosion

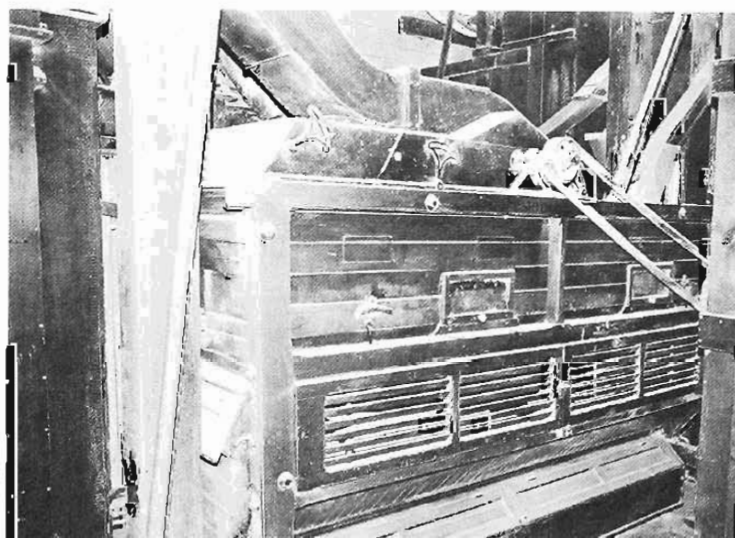
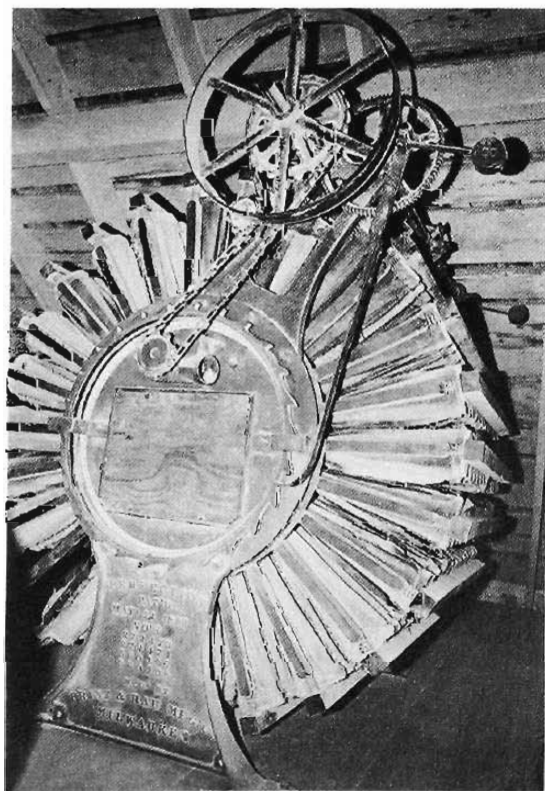
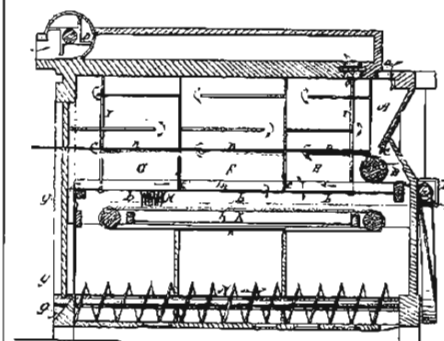




was the increased amount of dust in mills due in part to the use of a pivotal modern innovation, the middlings purifier, which allowed the production of "pure" white flour. At right is an early design patented by George T. Smith, and below, right, is one of Smith's purifiers still in usable condition in the Stockton Roller Mill in Stockton. Also to be found in good condition in the Stockton mill is an early dust collector (below) of a kind designed by a Milwaukee firm to decrease dust in mills and prevent mill explosions like the one in Minneapolis in 1878.

*G. T. Smith,  
Machine for Bolting Flour,  
Substance Filed May 4, 1872*

Fig. 3.



Minnesota, however, nothing compares with the manufacturing schedules of the United States Manuscript Census for 1860, 1870, and 1880. Of particular note is the 1880 census which includes a special survey of flour and grist mills. These handwritten census returns, filled out by local enumerators, contain such details as the amount paid to workers in the mills (usually from \$1 to \$2.50 for a twelve-hour day), the amount and value of grain bought and flour produced, the streams on which water-power mills were located, and even the type, dimensions, and horsepower of the water wheel or steam engine used for power. Other lists of mills for alternate and later years can be found in state and city business directories, often with power and capacity statistics.

While the census provides an extremely detailed view of the flour mills at ten-year intervals, it is necessary to go to narrative sources for the chronological, year-to-year story of changes in ownership and operation. Most helpful here are county histories, local newspapers, and, again, the *Northwestern Miller*. Not only do these sources recount the growth of individual mills, but sometimes they connect the miller with other events in the county or community. Often mill owners, as opposed to less wealthy mill operators, were men of some capital and standing and active in local affairs. Often, too — like the Pillsburys and Washburns in Minneapolis — they became involved in other businesses and industries. Some water-power mills, such as the Central Minnesota Power and Milling Company in Sauk Centre, were early sources of electricity because they could connect electrical generators to their water turbines. Other mills established lines of country grain elevators to insure adequate supplies of wheat.

Maps are a valuable source of milling information because both the census and the county histories usually are vague about mill locations. A relatively accurate but not necessarily complete statewide source for mill locations is the *Illustrated Historical Atlas of the State of Minnesota*, published by Alfred T. Andreas in 1874. It is, of course, limited to those counties which were well developed by that year, but nevertheless is a good starting point. Mill sites are indicated by an asterisk on the county maps, but often no indication of mill type, grist or saw, is given. For more detailed locations it is necessary to turn to an early volume of county plat maps. In many cases, such as the 1894 *Plat Book of Goodhue County*, not only can the mill be located but also the course of the old mill water race way. If the site is in an undisturbed area the remains of the race often can be found today and followed from an old dam site on the water source along the headrace to the mill location and then along the tailrace back to the stream.<sup>22</sup>

For mills located in cities or larger communities the maps produced by the Sanborn and Rascher insurance companies are extraordinary documents. First published

toward the end of the nineteenth century and continuing into the twentieth, they provide precise outlines of the mill buildings, describe the materials used in construction, such as brick, metal, or wood, and, in some cases, indicate where various operations were conducted within the structure. The drawings often are accompanied by a descriptive paragraph about the mill operation.

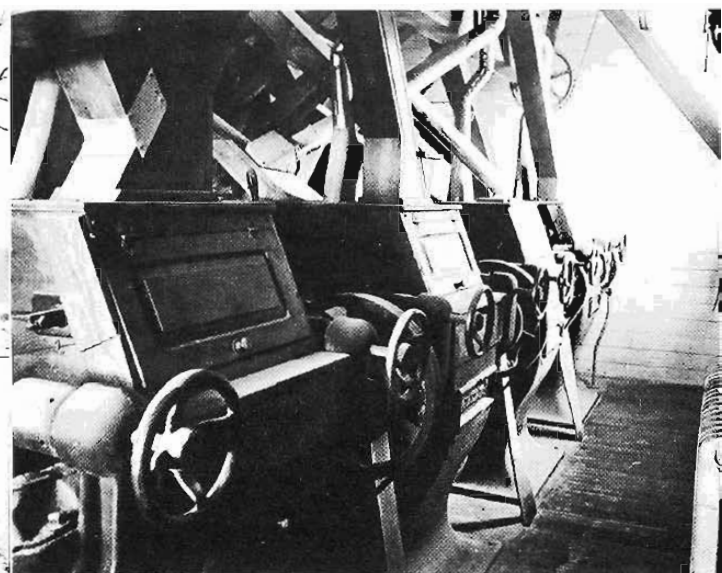
Finally, no researcher in the history of Minnesota flour milling should miss visiting the state's few remaining mills. Despite the international importance of Minnesota in the industry, little has been done in the way of mill preservation over the years. Virginia, for example, has almost 400 old mills compared to Minnesota's surviving few dozen.<sup>23</sup> There is no center for the history of flour milling in the state such as exists for the two other major state industries: mining, at the Iron Range Interpretative Center in Chisholm, and lumbering, at the Forest History Center near Grand Rapids.

FOR MILL HUNTERS, a good place to begin is at St. Anthony Falls where there are five old mills remaining. Here stand the giants of almost a hundred years ago, the Pillsbury and Washburn A mills, and, nearby, the Humboldt, Standard, and Crown mills. Once throbbing with production, they are all quiet now except for packaging operations along with a tiny graham flour operation continuing in the Pillsbury mill.

Although the great milling companies still flourish in the St. Anthony Falls area, the atmosphere of early milling is gone. In the 1880s, 3,000 people would turn out for the annual picnic of the Minneapolis Head Millers' association. Members of the Head Millers' and Operative Millers' associations would meet early in the morning at the office of the *Northwestern Miller* and, with "Danz's string band" in the lead, they would march down Washington Avenue to the depot. It would take forty-three cars in three special trains to transport all the picnickers to the Hotel Lafayette at Lake Minnetonka. Once there, speakers such as humorist Bill Nye would spin milling yarns — like the one about going into a nine-story flour mill as a young man and telling the head miller that he wished to begin at the bottom and work up. "So he set me at work in the basement chopping ice from the turbine wheel." The remainder of the day would include the traditional baseball game between the teams from the Pillsbury and the Washburn mills, fol-

<sup>22</sup>Charles M. Foote and J. W. Henion, *Plat Book of Goodhue County* (Minneapolis, 1894).

<sup>23</sup>For a brief discussion of the numbers of surviving mills in Virginia, see "Virginia Old Mill List," in *Old Mill News*, publication of the Society for the Preservation of Old Mills, April, 1978, p. 18; for surviving mills in Minnesota, see Frame, *Millers to the World*.



lowed by the sack race, the greased pole climb, the greased pig catch, tub race, canoe race, and foot race (for a first prize of "\$10 opera glasses"). Throughout the day Danz's band would provide music for dancing in the hotel parlors while the steamer *Belle of Minnetonka* took excursionists out on the lake.<sup>24</sup>

The millers probably deserved their brief annual holiday, for daily life in the mills seems to have been dusty monotony punctuated by gruesome tragedy. It is not for nothing that gristmills have produced clichés for dullness like "run of the mill" and "same old grind." In the nineteenth-century diaries of Blue Earth County miller Andrew Friend and miller-millwright Otis A. Pray can be found countless daily entries of nothing more than "worked on mill" or "ran mill."<sup>25</sup>

At the same time, milling machinery accidents, occasionally bloody, were reported in the milling journals with a fatalistic acceptance. Catching loose clothing and hair in gears and pulleys was common and occasionally led to frightening but less-than-fatal encounters. In 1881 the *American Miller* reported the man-versus-machine struggle of Austin miller James Donelson, whose coat became enmeshed in a conveyor gear. "Before the mill could be stopped the gear had stripped every stitch of clothing from him except his boots, and with that exception he was left as naked as the day he was born." Donelson survived by bracing himself against a post while the

*THE STOCKTON ROLLER MILL* in Stockton is Minnesota's sole surviving commercially active waterpower flour mill. The view at left across the millpond was taken in 1959. At right is a present-day view of the mill's interior.

machinery chewed up his clothes which "had to be cut away from the shaft with a chisel, and altogether it was lucky that there was no mince meat mingled with them."<sup>26</sup>

Walking today along First Street South where a wood plank-covered canal once supplied water to the mills' giant turbines, it is difficult to imagine that a century ago this was the heart of the city's industry, whirring and humming twenty-four hours a day. Across the river on old Main Street, the center of attraction no longer is the Pillsbury A Mill, largest mill in the world and once pictured on postcards that awestruck tourists sent home to friends. Present-day visitors quickly pass the looming stone A on their way to restored and renovated buildings up the street which now house restaurants and shops.

For the atmosphere of an early flour mill it is necessary to travel into rural Minnesota. At least three old mills remain commercially active: the Stockton Roller Mill (1889) at Stockton in Winona County; the Faith Flour Mill (1916) at Faith, near Twin Valley in Norman County; and the Swaney White Flour Mills, formerly the Freeport Roller Mill (circa 1898), at Freeport in Stearns County. Both the Stockton and Faith mills have been entered in the National Register of Historic Places. Both were built to operate with water turbines, whereas the mill at Freeport originally used steam power. Both the Freeport and Faith mills have been converted to electricity, while Stockton remains Minnesota's sole surviving water-power commercial mill.

<sup>24</sup> For reports of millers' picnics, see *Northwestern Miller*, 17:618 (June 27, 1884), 19:610 (June 26, 1885), and 21:615 (June 25, 1886).

<sup>25</sup> For Otis Pray, see various diaries in the Pray Papers; Andrew Friend Diary, 1857-1880, typescript copy in manuscripts division, Minnesota Historical Society, location of original unknown.

<sup>26</sup> *American Miller*, 9:149 (April, 1881).

At all three places a visitor still can be thrilled by a working mill. The experience is at its best, perhaps, at Stockton where the shafts and belts slowly pick up speed when the water gates for the turbine are opened. Soon the entire wood-framed building is quietly vibrating as grain makes its way invisibly and mysteriously, to the uninitiated, through the sequence of machines via a maze of elevators and conveyors, untouched by the millers who peer into the equipment from time to time, checking adjustments.

In each mill can be seen operating historic middlings purifiers, roller mills, and the many other devices necessary for making flour, such as cleaners, scourers, sifters, reels, and packers. For the casual tourist, the mill buff, or the scholar studying architecture, technology, or perhaps the sociology of milling and the work process, there is no substitute for the actual mill. Various individuals and local organizations in the state are attempting to preserve other old mill buildings, any of which it would be both enjoyable and profitable to visit.<sup>27</sup>

These small rural milling operations are as important, historically, as the mighty urban installations in Minneapolis. Each tells an important part of the story of the era when Minnesota was known around the globe for its vast production of fine flour. Though neglected by historians, the mill buildings and machines are as vital as the society's rich manuscript and library holdings. Together,

all of these resources make Minnesota, and the Minnesota Historical Society, as central to national milling research as the state itself was to the national development of the industry.

<sup>27</sup>Old flour mills involved in preservation and restoration programs, both public and private, include the Fairhaven Mill (Wright County), Phelps Mill (Otter Tail County), Pond Mill (Minnesota Valley Restoration Project, Scott County), Schech's Mill (Houston County), Fugle's Mill (Olmsted County), Terrace Mill (Pope County), and Tunnel Mill (Fillmore County); Frame, *Millers to the World*, 147.

THE ENGRAVING showing the rubble after the 1878 explosion on p. 153 is from Jacob Stone, *The Flouring Mills of Minneapolis, Minn. and Their Immediate Exposures As Viewed by an Underwriter* (Minneapolis, 1878). The engraving of the inside of a Minneapolis mill on p. 158 is from the *Northwestern Miller*, Holiday Number, 1884-5, p. 11. The engraving of the turbine is from an ad in *The Miller's Journal*, 16:492 (May 17, 1882). The George T. Smith patent drawing on p. 159 is from the Otis A. Pray Papers, division of archives and manuscripts, Minnesota Historical Society. The roller mill on p. 159 is from William C. Edgar, *The Story of a Grain of Wheat* (New York, 1903). The two photographs of machines in the Stockton mill on p. 159 and the interior view of the same mill on p. 161 were taken by Robert M. Frame III. The picture of the Pillsbury A Mill on p. 155 is by Alan Ominsky and the outside picture of the Stockton mill on p. 161 by Eugene D. Becker. These and all other illustrations are in the collections of the MHS audio-visual division.

## BOOK REVIEWS

*The Northern Expeditions of Stephen H. Long: The Journals of 1817 and 1823 and Related Documents.* Edited by Lucile M. Kane, June D. Holmquist, and Carolyn Gilman.

(St. Paul, Minnesota Historical Society Press, 1978. xii, 407 p. Illustrations. \$17.50.)

AS AN OFFICER in the Topographical Engineers, Stephen Harriman Long (1784-1864) headed five government-sponsored exploring expeditions into the American West between 1816 and 1823. The journals of his two northern expeditions constitute 60 per cent of the pages in this book and are his only personal journals known to have survived the ravages of time. The four small leatherbound volumes — the second of two for the 1817 trip and three for the 1823 expedition — have been in the possession of the Minnesota Historical Society since the early 1860s when they were acquired from the scien-

tist, Edwin James, the official chronicler of Long's more famous Rocky Mountain expedition of 1819-20.

In 1860 the Minnesota Historical Society published the 1817 journal in its *Collections* under the title "Voyage in a Six-Oared Skiff to the Falls of St. Anthony . . ." but the present volume is its first annotation and the first publication for the 1823 journals. The book is a handsome and scholarly work, not pretentious but attractive and easy to read and one of which the society may justly be proud.

Long's 1817 reconnaissance of the Mississippi River as far north as present-day Minneapolis and of the Wisconsin River as far east as the portage to the Fox was a modest assignment, requiring the assistance of but seven soldiers and two and one-half summer months. He examined the fortifications at Forts Crawford (Prairie du Chien, Wisconsin), Armstrong (Rock Island, Illinois), and Edwards (Warsaw, Illinois), inspected sites for new posts, and gathered information on the Indian tribes. By contrast, the 1823 expedition was much more ambitious. While its stated objectives were purely scientific, the British suspected it had hidden motives, and Long himself undoubtedly hoped to locate and mark the northern boundary of the United States along the forty-ninth parallel. The complement of scientists he recruited included astronomer James

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