



# OLD GRAUE MILL

AN ILLINOIS HISTORIC MECHANICAL  
ENGINEERING LANDMARK

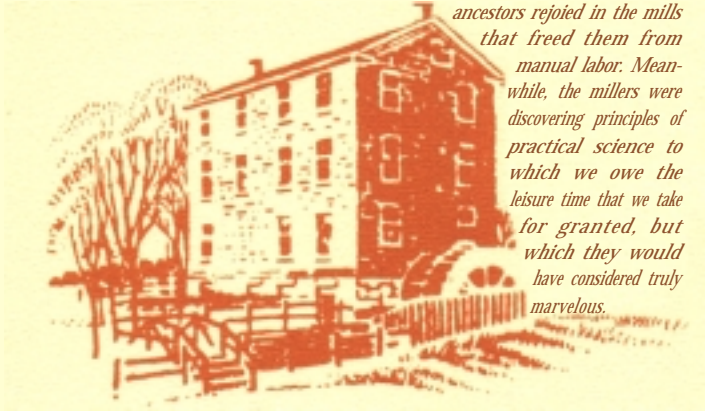
---

FOX VALLEY SECTION ● THE AMERICAN  
SOCIETY OF MECHANICAL ENGINEERS

---

OAK BROOK, ILLINOIS  
MAY 2, 1981

*When you visit restored or running mills, take advantage of the chance to explore them. They reveal only gradually the complexity of their inner workings, their strengths and stubborn flaws, the variety that gives each its peculiar distinction. Their machinery illustrates the first tremendous advance in the use of natural power, and the gradual evolution of mechanical engineering. Our ancestors rejoiced in the mills that freed them from manual labor. Meanwhile, the millers were discovering principles of practical science to which we owe the leisure time that we take for granted, but which they would have considered truly marvelous.*



from **The Mill**

*Fox, Brooks and Tyrwhitt  
N.Y. Graphic Society  
Boston, 1976*



*Frederick Graue*

## **THE ENGINEERING SIGNIFICANCE OF THE GRAUE MILL**

The recognition of the Old Graue Mill as an Illinois Historic Mechanical Engineering Landmark by the American Society of Mechanical Engineers is especially significant. As the only grist mill so designated on a national or local level, it stands as a representative of an important technology and era in the history of America and its mechanical engineering profession—now entering its second century. Only a relatively few restored mills remain as reminders of the many hundreds that exploited the rich water resources and ingenuity of the early millwrights of this country, making possible its preeminent growth in agriculture and food processing—despite the limited manpower available during its westward expansion.

The original engineering features of the Graue mill in the mid nineteenth century—its undershot water-wheel, wooden gearing system, belt power transmission, bucket elevators and associated bolters and sifters—were representative of an ancient technology that began with the Roman engineer Vitruvius, and was brought to the threshold of the modern industrial era in the early 1800's by the celebrated American, Oliver Evans, who is considered by many to be the first thoroughgoing plant engineer.

This particular mill, which was constructed and put into operation around 1852 by Frederick Graue (Anglicized soon after arrival from Germany to Gray) and William Asche, became an important early economic unit and landmark in the community of Brush Hill (now Hinsdale-Oak Brook) and the surrounding countryside. The present partial restoration of the mill and its machinery by the Graue Mill Corporation in 1950 recreates some of the marvelous "feel" of these early mills—the sounds of water-wheel, creak of wooden gearing, rumbling of the buhrstones and the vibration of power.

## **HISTORY OF THE GRAUE MILL**

Frederick Graue was the builder, and the mill was owned and operated by three successive generations of Graues before it outlived its usefulness. It ground wheat, corn, oats and buckwheat and is still remembered vividly by older local residents as a leading economic unit in the community.

The original dam at this site was built of brush in 1837 by Nicholas Torode, and by Sherman King, who came to this area the year before. It was used to power a sawmill, but was washed out a few years later, and about 1844 was replaced with a log dam. At that time they also built a log mill which was burned in 1848.

In 1849 Fred Graue, who is listed in Richmond's history as one of the settlers prior to 1835 in York Township, together with William Asche, purchased this mill site following the destruction of the log mill by fire. Graue was 31 years old, having been born in Hanover, Germany, January 25, 1819, while Asche was 10 years his senior. They erected a sawmill, and after three years' association together in business Mr. Graue bought the entire interest. By the summer of 1852 he had completed the brick mill, a building 45 feet by 28 feet in size, three stories high with a basement. He put in two runs of buhrs and according to Blanchard's history, "has since run same mostly on custom grinding. He has about 200 acres of land which he carries on, but gives his attention personally to his milling."

The mill machinery was installed by a millwright brought from New York. None of the original plans of the building are on record, although the Historic American Building Survey has developed accurate plans of the structure as it stood in 1934.



The brick in the building was made from clay taken from Mr. Graue's farm and burned in a kiln near the site. The stone for foundations and trim came from a limestone quarry near Lemont, Illinois. The timbers for posts, girders and joists are of white oak out of a timber tract along the Illinois and Michigan Canal near Lemont.

As the accompanying plan illustrates, the mill-race led easterly from the south side of the mill-pond to the wheel (later a turbine) and emptied the water under an arched opening at the lower end of the race, the water joining the stream well below the dam. Just west of the mill were gates in the race by which the flow of water past the wheel was regulated to relieve somewhat the flow over the dam. At such times the wheel was allowed to idle.

The log dam was replaced by a crib and plank dam in 1879. Some time before 1874 the water power furnished by this dam across Salt Creek was supplemented by steam power, a boiler and stack being built on the opposite side of the race, on the island to the north of the mill. Richmond's history says, "A steam flour mill is now in operation at Brush Hill, owned by F. Gray. This mill has two run of stones." Blanchard's history states, "It has recently been remodeled by Mr. Graue by putting in a Jonathan [ed: probably means Jonval turbine] mill with a capacity of 125 barrels superfine flour per day. It runs by steam and water power both." Records indicate that a 56-inch Standard Leffel Upright Turbine was installed in 1868.

This first steam power plant was destroyed by explosion about 1880 and the smoke stack on the island was blown down. The steam plant and stack were then built in 1884 on the east side of the mill building south of the mill-race. The addition was frame and the stack was of brick. To the west of the brick mill building another frame wing was built, perhaps a little after 1890.



**MILL AND DAM AS THEY APPEARED ON POST CARD ABOUT 1900**

During the Civil War syrup was reportedly made in this mill from cane. It was boiled in steam. In 1893 a hydraulic cider press was installed in the mill.

The mill dam provided resource for another industry that was important to Hinsdale and the surrounding communities. The J. F. Ruchty Ice Co. began cutting ice during the winter on Salt Creek in 1880, storing it in an ice house west of the mill on the south side of the creek, and distributing it by wagon during the summer.

In 1916 the crib dam built in the 1870's was washed out. For 18 years there was no dam at this site until the new concrete and stone structure was constructed.

After 1916 and up to about 1924 the mill was operated occasionally. The miller foreman for many years was Patrick Kammeyer, who died in 1928. Mr. F. O. Butler acquired the property in 1921, and in 1931 the mill was added to the properties of the DuPage County Forest Preserve District, forming an addition to the fine Fullersburg Forest preserve tract in Oak Brook which lies along Salt Creek and constitutes one of the leading recreational areas in the county.

## **RESTORATION**

In 1934 the DuPage County Forest Preserve Commissioners, realizing the historical value of the old structure, became interested in the possibility of restoring the old Graue Mill. About the same time an historical society was organized in the county and planned to cooperate in securing adequate treatment of the mill for historical preservation and restoration, and as an educational exhibit. It was decided that the mill should be restored to the period of 1852-1868 as authentically as possible.

In the next year, 1935, after the wooden wings were removed, the Civilian Conservation Corps company built a new concrete dam, faced with stone, on the site of the former crib dam. The camp personnel also reconstructed the stone mill-race and made investigations and studies for the reconstruction of the mill itself.

Late in 1935 the Forest Preserve Commissioners undertook repair of the windows and other parts of the building in accord with the carefully studied restoration plans, and reconstructed the mill wheel and a part of the mill machinery through a Federal Works Progress Administration project. Detailed drawings for the restoration of a portion of the wooden cog wheel and trundle gear system based on research by Joseph F. Booten, Chief of Design, Illinois State Division of Architecture, were prepared. Materials for the wheel were purchased under this project but the work was delayed for several years due in part to the difficulty of obtaining skilled labor on WPA rolls.

Although the restoration project was eventually completed, it suffered from neglect for about a decade. The mill property was subsequently leased to the DuPage Graue Mill Corporation, a non-profit civic group, who funded the repair of the water-wheel, the gear system and operating mill stone in 1950. The mill was listed in the National Register of Historic Places, May 12, 1975.

Power to the stones and gear system is currently supplied by electric motor. The water-wheel is allowed to idle in the mill race.

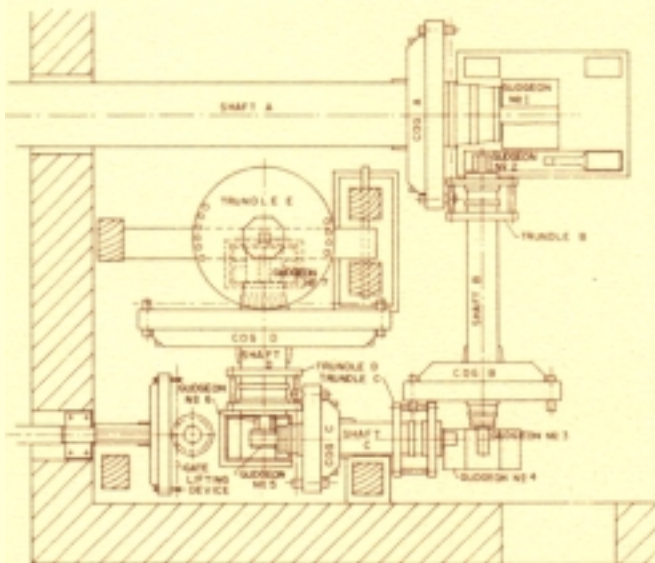
## **ASME NOMINATION AND RESEARCH**

The nomination of the Old Graue Mill as a mechanical engineering landmark was made in June, 1977, by J. D.Geller, then chairman of the Fox Valley Section, ASME, based upon a preliminary investigation by A. R. Neinast. It was approved as a local landmark in December, 1978, by the ASME History and Heritage Committee. Wording for the plaque was approved in 1980.

Additional research has been carried out by the Fox Valley Section with special attention being given to the authenticity of the water-wheel and gear restoration. Although there is reliable evidence of the existence of the original undershot water-wheel and the associated wooden gear system, it now appears that the original gear system was somewhat less complex than the restored version. This conclusion is based on evidence that the original dam (hydraulic head on the wheel) was significantly higher (as much as five feet higher) than the 1934 restored dam height of three feet.

This situation was suspected by Joseph Booten in 1939 who stated in the Chicago Regional Planning Association report that, "It was evident from the beginning that one or more of the known factors was not in common with the original and it appeared to be the water head. Try as I might, I could not turn the stones with the proper speed, and fit the machinery around the beams and columns in less than four sets of gears and trundles. I am quite sure the original must have been of a simpler arrangement."

A drawing of the restored four stage gear system having a gear ratio of 15 to 1 is illustrated here.



COG A: 47 COGS    TRUNDLE B: 18 ROUNDS  
 COG B: 39 COGS    TRUNDLE C: 18 ROUNDS  
 COG C: 27 COGS    TRUNDLE D: 18 ROUNDS  
 COG D: 66 COGS    TRUNDLE E: 37 ROUNDS

**DRAWING OF RESTORED GEAR SYSTEM IN NORTH WEST CORNER OF MILL BASEMENT**

With 8 feet of hydraulic head, a gear ratio of about 8 to 1 would have been sufficient to turn the pair of four feet diameter mill stones at the desired speed (about 125 rpm). Furthermore, this could have been accomplished with only two sets of cog wheels and trundles and would fit within existing beams and columns. Only about one half the water flow would be required in this case compared to Booten's restoration plan.

**BIBLIOGRAPHY**

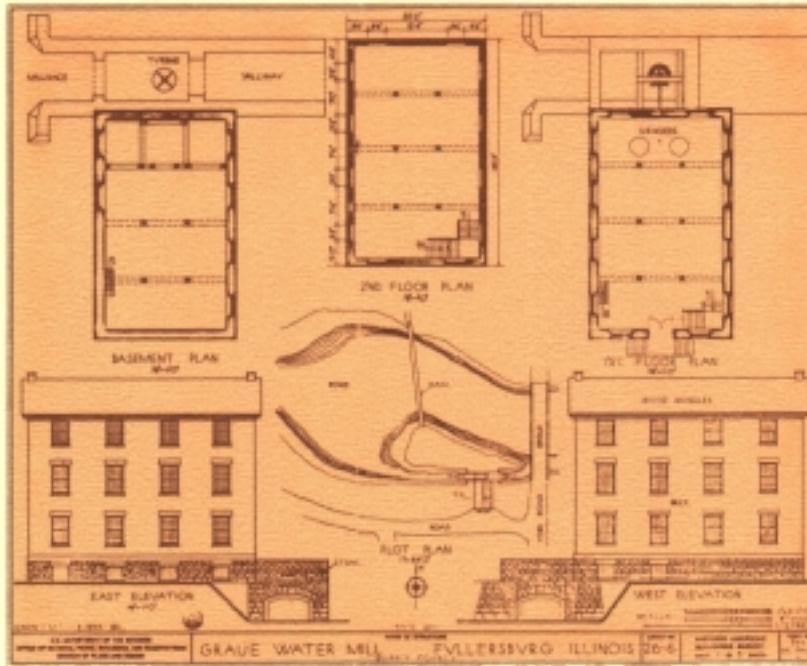
1. Dugan, H. H., Village on the County Line - A History of Hinsdale, Illinois, Lakeside Press, 1949.
2. Evans, O., The Young Mill-Wright and Miller's Guide, Lea & Blanchard, 13th edition, 1850 (reprinted in 1972 by Arno Press Inc.).
3. Chicago Regional Planning Association, The Old Graue Water-Mill at Fullersburg (Near Hinsdale) DuPage County, Illinois. April 1939.
4. Fox, W., B. Brooks & J. Tyrwhitt, The Mill, N. Y. Graphic Society, Boston, 1976.
5. Selby, P. and N. Bateman, Historical Encyclopedia of Illinois, DuPage County, Vol. II, Addison Township, 1913
6. Richmond, C W and H. F. Vallette, History of DuPage County. (1857).
7. Combination Atlas of DuPage County, 1874, Thompson Brothers and Burr, Elgin, Illinois.
8. Blanchard, Rufus, History of DuPage County, O. L. Baskin & Co., Historical Publishers, 1882.
9. Lowise, M. and B. Todd, An Index to the Names of Persons Appearing in History of DuPage County, Illinois by Rufus Blanchard, prepared by the Genealogy Projects Commission to Winnetka Public Library, Winnetka, Illinois, 1972.
10. Hindle, B. (ed.), America's Wooden Age: Aspects of its Early Technology, Sleepy Hollow Restorations, Tarrytown, N. Y., 1975

**THE NATIONAL HISTORIC MECHANICAL ENGINEERING LANDMARK PROGRAM**

There are as of the date of this publication 55 National Landmarks and 5 State landmarks that have been designated by ASME. It is especially significant that Dr. Daniel C. Drucker, Dean of the College of Engineering at the University of Illinois, who will make the presentation of the plaque at this first Illinois landmark, also made the inaugural presentation of the National Mechanical Engineering Landmark program in 1973 when he was President of ASME.

Some of the National Landmarks in the Chicago area are:

- |                                                      |                                                                       |
|------------------------------------------------------|-----------------------------------------------------------------------|
| State Line Generating Unit # 1<br>Hammond, Ind.      | A. O. Smith Chassis<br>Frame Factory<br>Milwaukee, Wisc.              |
| Cooperative Fuel Research Engine<br>Waukesha, Wisc.  | Pioneer Zephyr Winton<br>8-201-A Diesel Engine<br>Chicago, Ill.       |
| Port Washington Power Plant<br>Port Washington, Wisc | East Wells Power Plant<br>(Oneida Street Station)<br>Milwaukee, Wisc. |
| Vulcan Steel Plant<br>Appleton, Wisc.                |                                                                       |



RESTORATION PLAN & ELEVATION DRAWING OF MILL CIRCA 1868



ETCHING OF GRAUE MILL AS IT APPEARED FROM NORTH OF SALT CREEK PRIOR TO 1874



## ACKNOWLEDGEMENTS

The Fox Valley Section of the American Society of Mechanical Engineers gratefully acknowledges the efforts of all who cooperated on the landmark designation of the Old Graue Mill.

### *The American Society of Mechanical Engineers*

Dr. Charles E. Jones, President  
Mr. Warren C. Fackler, Vice President, Region VI.

### *The ASME National History and Heritage Committee*

Prof. J. J. Ermenc, Chairman  
Prof. R. S. Hartenberg, Northwestern University  
(emeritus)  
Ms. Jill Birghenthal, Administrator

### *The ASME Fox Valley Section*

Dr. Nelson Koopman, Chairman  
Mr. Larry Oyen, Past Chairman  
Mr. Jay Geller, Past Chairman  
Mr. Allen Neinast  
Dr. Tuncer Kuzay  
Dr. Gerald Moyer  
Prof. Robert Harvey  
Mr. William Smith  
Mr. Rick Hudson

### *The DuPage Graue Mill Corporation*

Mrs. Beverly Vosseller, Board President  
Mrs. Chris Meier, Mill Manager  
Mr. William Whitney  
Mr. Wilson Connell, Jr.  
Mr. Donald Schmidt (ex-board member)

### *DuPage County Forest Preserve*

Mr. Howard C. Johnson, Director  
Mrs. Carolyn Sechnick

### *Village of Hinsdale Residents*

Mr. and Mrs. T. A. Olson  
(granddaughter of Fred Graue)  
Mr. George E. Ruchty

### *DuPage County*

Mr. William J. Faedtke

### *DuPage County Historical Museum*

Mrs. Louise Spanke

Material for this brochure was compiled and edited by Gerald Moyer and Tuncer Kuzay. Mr. Christopher Svoboda, engineering student at the College of DuPage, assisted with the analysis of the water-wheel and gear system. Most of the Graue Mill history was taken from the 1939 Chicago Regional Planning Association Report.

# ILLINOIS HISTORIC MECHANICAL ENGINEERING LANDMARK

THE GRAUE MILL,  
DESIGNED AND BUILT BY FRED GRAUE,  
BEGAN OPERATION IN 1852 AS A  
WATER-WHEEL POWERED GRIST MILL,  
SUCCEEDING A SAWMILL ON  
THE SAME SITE. IT SERVED AS A  
LABOR-SAVING UTILITY FOR PERSONS  
IN THE VILLAGE OF BRUSH HILL  
(HINSDALE) AND SURROUNDINGS UNTIL  
WORLD WAR I. THE MILL REPRESENTS  
THE MILL MACHINERY DESIGN OF  
THE EOTECHNIC PERIOD  
(10TH TO 19TH CENTURIES)  
WHEN WOOD WAS THE PRINCIPAL  
MATERIAL OF CONSTRUCTION.

THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS  
FOX VALLEY SECTION

1980