Pencil Factory Kiosk

Mills Along Nashoba Brook

Harnessing Water

The basic features of all water-powered mills include the following:

- A dam to create a mill pond and a vertical drop in the water flow. The pond serves as a reservoir to even out the flow of water over dry and wet seasons. The vertical drop (head) creates a pressure difference that is one factor determining the amount of power available to run the mill.
- A sluiceway that channels water from millpond through the mill. In wet seasons some of the water spills over the dam or through an overflow sluiceway that bypasses the mill.
- A water wheel or turbine in the path of the water flow that rotates as the water pushes on its blades. A gate controls the water flow through the wheel.
- A power train (shafts, gears, pulleys) that transfers the power of the water wheel or turbine to the machinery of the mill.

What Happened to the Mills?

Advancements in technology, and transportation during the 19th century brought competition as well as opportunity for the mill owners.

Power looms and spinning machines replaced much of the home manufacture of cloth and the functions of the carding and fulling mills were absorbed into large textile mills situated on major rivers.

As the up-and-down saw was replaced by higher-powered circular and band saws, the relatively low-power sawmills on Nashoba Brook were at a competitive disadvantage to large-river millsites.

Improved transportation, including the construction of a railroad along Nashoba Brook in the 1870s, allowed these larger mills easy access to local markets. The railroad, however, also provided increased opportunities for the local mills to manufacture specialized products to be sold in a larger geographical market. Products such as bellows, pencils, sashes, blinds and plaster that used moderate amounts of water power were made at the Nashoba millsites during the 19th century.

As electrical power and machinery became more available and economical toward the end of the century, the need for water power decreased. Eventually all the millsites were abandoned.

The First Mills

The English colonists who moved into the Nashoba Valley during the late 17th and 18th centuries were mainly farmers who needed lumber to build homes and barns, iron implements and

hardware for home and farm, milled grain to feed their livestock and to make bread for themselves, and cloth from which to make clothes. To meet these needs, some of them took advantage of the Nashoba Brook watershed by constructing water-powered sawmills, forges, gristmills, and fulling mills and became part-time or full-time millers. In the early 19th century, a carding mill for preparing wool and cotton was established.

Types of Early Mills

- Gristmills were used to grind grain grown by local farmers. A large vertical water wheel turned a horizontal circular grindstone on top of a similar stationary stone. Grain placed between the stones could be ground finely for making bread or coarsely animal feed.
- Sawmills were used to cut logs into lumber. A vertical saw was moved up and down by the power from a small-diameter, fast-turning water wheel that sounded like a bird as it turned (hence the name 'flutter' wheel). The same wheel powered a carriage on which the log was mounted to drive the log into the moving saw.
- Fulling mills were used to finish home-woven cloth. The cloth was placed in a tub along with detergent water and beaten with water-powered hammers to rid the cloth of excess oils and make the fibers more compact or fuller.
- Carding mills were used to prepare wool or cotton. The materials passed between rollers with fine-wire teeth to make the fibers straighter and more uniform in preparation for spinning into yarn. The name 'carding' originated from the hand-held cards used in the home.
- Forges were used to process iron. Water power was used to work the bellows that supplied air to the furnaces used in these processes. Water also powered a large hammer that formed wrought iron bars. In some mills, these wrought iron bars were further processed by water-powered rolling and slitting machinery.

Site 1: A gristmill and sawmill were operated here in the 1730s by Thomas Wheeler, Jr. and later owned by Gershom Davies and his descendants. In 1811, a gristmill and sawmill at this site were assessed to John Hayward, Jr. and Phineas Wheeler and later to their descendants. From 1868 through 1890, Francis Robbins was assessed for "sawmill, 2 shops and wheels, water power." In the early 20th century, the property was assessed to his son Spoffard Robbins, a wood turner, but water power was not specified, perhaps because it was no longer used.

Site 2: In the 1820s, a gristmill, fulling the mill, and carding factory were owned by Uriah Foster and Jeremiah Hosmer. In the 1830s, Eben Wood had a pencil factory here (see other panel).

Site 3: Ebenezer Davis, Jr. built a mill here in 1848 which was used at various times for the manufacture of bellows, pencils and sashes and blinds for windows. The pencil works continued until 1888 under the ownership of Lewis Ball, then Martha Ball, and finally Henry Smith.

Site 4: John Barker built a forge here in 1728 equipped with "a trip hammer and other implements and conveniences for working in iron." In the 1790s a sawmill was established by

Joseph Robbins and stayed in business for almost 100 years. A gristmill owned by Daniel Wetherbee in 1840 continued operations until the early 20th century, producing plaster in its later years.