

PREINDUSTRIAL MILLS IN NEW ENGLAND AND NEW YORK

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The basic technology for harnessing waterpower existed well before the Industrial Revolution. From the beginning of the colonial era in the mid-1600s to the late 1800s, the hundreds of streams and brooks that flowed across New England and New York powered thousands of small rural gristmills, sawmills, and fulling mills. Country mills were integral parts of the preindustrial American economy and laid the groundwork for the United States' Industrial Revolution. Most rural communities had at least one such mill, and many had several (1). In the late 1700s, Thomas Jefferson thought that every "neighborhood" in America had a gristmill, and in 1820 Connecticut luminary and Yale President Timothy Dwight remarked that gristmills and sawmills were "furnished in abundance in every parish" in New England and New York (2). One English traveler in America shortly after the Revolutionary War counted 1,100 mill privileges in New Jersey, a thousand in frontier Kentucky, and in Pennsylvania "almost innumerable mill seats ... conveniently distributed by Providence throughout the State" (3). A scholar of frontier New York has estimated that by 1825 there was on average one gristmill and one sawmill for every two townships (4). When the United States census began recording the number of country mills in 1840, the nation boasted more than 28,000 gristmills and nearly 32,000 sawmills (5). When the Industrial Revolution began in the late 1700s and early 1800s, it would build upon the knowledge of old-time country millers, already in place.



Windham, Connecticut's famous Frog Pond was a preindustrial millpond. The water in the pond could be channeled through sluice gates into a narrow raceway that carried it to turn a wooden waterwheel. The mill at the Frog Pond was a gristmill, used by farmers to grind grain. The Frog Pond is shown in this c. 1910 postcard. From the collections of the Windham Textile and History Museum.

Still, there were important differences between the old country mills and modern industrial mills. Most of the country mills in old-time New England were small, simple affairs, run by just the millers themselves, with perhaps a hired hand or two. Many operated as “custom” mills, meaning that instead of being paid in cash, the millers took part of the product (flour, meal, boards, shingles, or fulled cloth) as payment, returning the remainder to the farmers who had brought in the grain, logs, or homespun cloth (6). Country mills required far less waterpower than would the later industrial mills. Unlike the industrial mills, they were usually located alongside small streams and brooks rather than large rivers, because the large waterways were too wide to dam cheaply.



This c. 1910 postcard shows the ruins of a preindustrial gristmill that once ground grain in Windham, Connecticut. Preindustrial mills like this were much smaller than the textile mills of the industrial age. From the collections of the Windham Textile and History Museum.

In western New York, where in the early 1800s most of the population had migrated from New England, a country millstream was usually a middle-sized brook with a swift current, rocky bottom, and steady flow (7). Country sawmills in New Brunswick, Canada, were mostly on small streams and brooks, where undershot wheels, although less efficient than overshot wheels, allowed for falls of 1.5 meters or less (8). Johnson's Creek in Essex County, Massachusetts, a typical New England millstream, was only 5 kilometers long, but in 1820 it could power five country gristmills and four sawmills (9). Country millhouses and milldams were as modest as the millstreams. A country millhouse was generally only a one- or two-story wooden structure with one waterwheel. Country sawmills usually had only one or two saws; and gristmills just one or two pairs of millstones (10). The dams were either made of fieldstone packed with clay or log cribs covered with stones and earth, although sometimes boards were used. Dams were about 3-4.5 meters high, but shorter dams were used with undershot wheels (11).

Sluice gates and flashing, which controlled the amount of water passing the dam, and raceways, which carried the water to the waterwheels, were generally made of planks, although sometimes the raceways were ditches, a meter wide and a half meter deep, lined with stone (12). A typical country gristmill on Columbia Lake Brook in Columbia, Connecticut, featured an overshot wheel and a log dam covered with earth, 4.5-5.5 meters high, spanning a small, rocky brook (13).

Rural mills in Maine were similar to those in Connecticut, Massachusetts, New York, and New Brunswick. They were usually constructed alongside small and middle-sized streams and brooks. As elsewhere, dams were of fieldstone, earth, or logs. Wing's Mills on the Messalonskee Stream had a log crib dam. John Damren's nearby sawmill had an earth dam reinforced with planks. Daniel Sargent's Seguedunk Stream sawmill had a stone dam, the relicts of which were measured at just over 2 meters high in 1988 but that were reported to have been almost 5 meters high a century before; it was 50 meters long and almost 2 meters thick.

The dam at White's Mills on the Kenduskeag Stream was 3.6 meters high and 68.5 meters long and created a 1- to 1.5 hectare millpond. Maine country millhouses were wood-frame structures, usually built just below the dam but sometimes directly on top of it. Damren's wooden millhouse was two-and-a-half stories on the downhill side and one-and-a-half stories on the uphill, with a shingled roof and clapboarded walls. Wing's Mills (also of wood) was one-and-a-half stories and resembled a large barn. In addition to the milldams, which were built to raise the water level so that it could be channeled into the raceways, which then carried it steeply downhill to turn the mill wheels, most Maine millers also erected crude water storage dams upstream to pond additional water – often by flooding bogs or raising the water level in natural lakes (14).

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When the first industrial mills were built in the late 1700s and early 1800s, they would utilize the same technology as the country mills – milldams, millponds, sluice gates, raceways, and mill wheels – but on a much more massive scale.

Notes

1. Louis C. Hunter, *A History of Industrial Power in the United States, 1780-1930* (Charlottesville, VA: 1979), 1: 116-118.
2. Thomas Jefferson to Brissot de Warville, August 16, 1786, in *Papers of Thomas Jefferson*, ed. Julian P. Boyd, et al. (Princeton, NJ: 1954), 10: 262; Timothy Dwight, *Travels in New England and New York*, ed. Barbara Miller Solomon (Cambridge, MA: 1969), 1: 379-380.
3. W. Winterbotham, quoted in Hunter, *History of Industrial Power*, 2-3.
4. William Wyckoff, "Frontier Milling in Western New York, *Geographical Review*, 76 (1986): 85.
5. *Report of the Manufactures of the United States at the Tenth Census* (Washington, DC: 1883), vii.
6. Hunter, *History of Industrial Power*, 4.
7. Wyckoff, "Frontier Milling," 82.
8. Graeme Wynn, *Timber Colony: A Historical Geography of Early Nineteenth-Century New Brunswick* (Toronto: 1981), 87.
9. Steven A. Spaulding, "The Groveland Mills on Johnson's Creek," *Essex Institute Historical Collections*, 119 (1983): 192.
10. Hunter, *History of Industrial Power*, 4.
11. Wynn, *Timber Colony*, 87.
12. Marion Nicholl Rawson, *Little Old Mills* (n. p.: 1935), 91-96, 162.
13. Personal inspection by Jamie Eves, November 1988.
14. Jamie H. Eves, "Shrunk to a Comparative Rivulet: Deforestation, Stream Flow, and Rural Milling in 19th-Century Maine," *Technology and Culture*, 33 (1992): 45-46.

