

The Surge of the Merrimack River

A walking tour
of Lowell, MA
that explores the
history of the
Merrimack River
and how it carried
this city to
industrial success.



Introduction



The Merrimack River carries runoff from the White Mountains of New Hampshire reliably south toward Boston. As seen on the cover page map, it takes an abrupt turn eastward just past the Massachusetts border and redirects its waters out to the Atlantic Ocean north of Cape Ann. This unexpected change of course reminds us that the Merrimack runs on its own authority.

The Merrimack has always been a vital ecological connection between the interior of mountainous New Hampshire and the coastal shoreline. Indeed, long ago—thousands of years ago—it ran directly into what is now Boston Harbor. The diversion that it has since charted came by way of the retreating Laurentide Ice Sheet which left glacial deposits that filled in the lower valley and rerouted the river northeast at what is now Lowell (detailed in the map above).¹ This area is an inflection point, showing the modern course of the river (modern in geological time, that is). The river can tell us much more about modernity, too, as we examine how it connected mountainous and coastal New England both culturally and economically and brought the region unprecedented prosperity.

In some ways, this is a history of the Merrimack River itself. But it is also a history grounded in a particular bend in that river, this inflection point at Lowell that surged in the early nineteenth century to generate staggering power. Lowell was America's first industrial city—incorporated in 1823 and named after Francis Cabot Lowell, millwright of the Waltham System. This system revolutionized New England industry because it was the first on this side of the Atlantic to integrate all the steps of textile production. Lowell and his peers built this system largely by pilfering patents from England and recreating them through trial and error stateside. Named posthumously, the city of Lowell brought this technology to life and created a surge of activity in the area throughout the nineteenth century.

The vast industrial production of this period was made possible by a studied command of the river's power. Not only did millwrights use the river's waterpower to spin their turbines, but the river remained a crucial shipping artery of the region as well. Because of the Merrimack's burgeoning activity in the nineteenth century, one commentator deemed it "the busiest, merriest, noblest water-way in New England."² The river remains, of course, absolutely central to the story of textile mills in Lowell—the industrial success that the city enjoyed would not have been possible without it. Since Lowell was a planned city, the site was specifically chosen to harness the natural power of Pawtucket Falls. Yet it was more than this unique environmental feature that caused Lowell become such an industrial powerhouse. Longstanding yankee culture along with nascent attitudes toward the convergence of nature and human development were also crucial in positioning Lowell to surge to such prominence.



Passaconaway Rock

Northern side of
Mammoth Rd bridge



In telling the story of this river, let us begin at this modest monument to Passaconaway, chief of the Pennacooks. The rock feels somewhat insufficient in marking the mutual influence between this man and his people and the river it overlooks. The Merrimack River was central to the Pennacooks—an allied network of native peoples that spanned across much of northern Massachusetts, central New Hampshire, and southern Maine. Many of these tribes concentrated in the Merrimack River valley where not only was the land fertile for agriculture, but the waters teeming with fish. The Pennacook tribes—and the other indigenous cultures that preceded them—depended on and shaped the riparian ecosystem for millenia; evidence from the Neville archaeological site near present-day Manchester points to the presence of fishermen in the region up to 8,000 years ago.³

Though he presided over the whole region, it is thought that Passaconaway probably lived further north up the river, closer to present-day Concord. The subgroup that frequented the Lowell area was known as the Pawtucket—eponymous with the falls before us. They celebrated this location as particularly fertile and would congregate seasonally not just to fish the bountiful waters, but also to attend to other cultural affairs. As historian JW Meader wrote of this area in 1869: “then [in the time of the Pawtucket], as now, it contained a large community, was a place of great note and importance, supplied the community with sustenance; then, as now, derived its importance solely and entirely from these falls.”⁴ Today, a dam constructed in the early nineteenth century pools water above the falls and diverts plenty to Lowell’s power canal system, causing the falls to run substantially drier.

Note that this monument to Passaconaway overlooking the river does not commemorate his relationship with the river itself, nor his leadership of his people. What it commemorates specifically is Passaconaway’s supposed conversion to Christianity in 1648. Though not the direct subject of this tour, I do believe this topic warrants further discussion.

Though it is not clear to what extent Passaconaway ever truly embraced Christianity, English settlers did indeed proselytize heavily in native communities in the mid-seventeenth century. The man here credited with converting Passaconaway, John Eliot, was one of the most fervent and active Puritan missionaries. He was one of few early English settlers to make a concerted effort at learning the language of the Massachusetts, and was the first to translate the Bible into a native language, even though most Indians could not read.⁵ One of Eliot’s more ambitious projects was the establishment of “Praying Towns” throughout southern New England at which Eliot would preach in an attempt to persuade Indians to convert to Christianity. Eliot founded a praying town here in 1653 known as Wamesit. In 1674, it had 75 inhabitants.⁶ Here, two cultures clashed in complicated ways. In a time when New England settler identity was primarily defined by religion, these “praying Indians” treaded the line precariously between two cultures. At best they were considered confused and at worst they were deemed duplicitous. To most they were not fully Indian nor fully Christian, and were easily betrayed by either side.

When King Philip’s War brought carnage all across the region in 1675—Wannalancit, son of Passaconaway, now sachem of the Pennacooks—retreated north with many of his people, heeding the advice of his father who had warned in his abdication speech never to fight with



The memorial to Passaconaway stands on the southwest corner of Mammoth Rd and Varnum Ave.

the English.⁷ Those that stayed, especially the “praying Indians” who were caught between two cultures, “suffered at the hands of both Philip and the colonials. They were killed indiscriminately by both sides; they were confined to their village; many were interned on Deer Island in Boston Harbor.”⁸ King Philip’s War was not only a turning point for the Wamesit Village,

but for New England native peoples broadly—no American war has since brought more carnage relative to the population size. It escalated the broader conflict between the two ethnic groups, both of whom feared being tainted by the other. Similarly observing the potential of the Merrimack River Valley, English settlers in Massachusetts Bay Colony continued to move inland and encroach on Indian lands in the following decades, soon driving them from the region almost entirely. Many English remained committed to Christian conversion and continued to organize missionary efforts well into the nineteenth century.

J Frederic Burtt wrote in the 1970s that “Arrowheads and other Indian artifacts can still be found occasionally on the banks of the Concord and Merrimack rivers—small relics of a well ordered, socialistic society depending upon cooperative labor, a society antithetical to the driving, capitalist, laissez faire industrialism of the successors to Passaconaway’s kingdom.”⁹ This positioning of the two cultures as “antithetical” to one another strikes me as somewhat of a gross oversimplification.

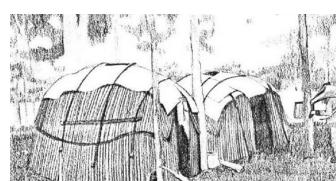
Indeed the conflict of King Philip’s War itself was largely predicated on the observed blending between the two cultures, which only accelerated as contact grew more intimate (though it was certainly never a balanced or harmonious fusion).

One of the chief similarities, of course, was that both cultures took shrewd advantage of all that the Merrimack River had to offer. Naturally, this looked quite different for each. As white settlers gradually supplanted native inhabitants in the Merrimack River Valley, their use of the river became more about capital extraction and property ownership. This started out on the scale of subsistence but eventually grew into an industrial surge. Even as the region became Anglicized, the Pennacooks weren’t forgotten. On a canoe voyage up the river in 1839, Henry David Thoreau observed the following:

We saw near the river, where the sand was blown off down to some ancient surface, the foundation of an Indian wigwam exposed, a perfect circle of burnt stones four or five feet in diameter, mingled with fine charcoal and the bones of small animals, which had been preserved in the sand. The surrounding sand was sprinkled with other burnt stones on which their fires had been built, as well as with flakes of arrow-head stone, and we found one perfect arrowhead. In one place we noticed where an Indian had sat to manufacture arrow-heads out of quartz, and the snake was sprinkled with a quart of small glass-like chips about as big as a fourpence, which he had broken off in his work. Here, then, the Indians must have fished before the white arrived. There was another similar sandy tract about half a mile above this.¹⁰



An array of Native American arrowheads, similar to those Thoreau would have found on the riverbank.



Drawing of Pennacook-style wigwams.



Atlantic Salmon swimming upriver.



Pawtucket Gatehouse

Southern side
of Mammoth Rd bridge



Retreating almost forty years before the onset of King Philip's War, we see English settlers in Massachusetts Bay Colony keen to anticipate the need for future farmland as their settlements became more established and their population grew. In 1638, the Massachusetts courts ordered an exploratory survey of the Merrimack River to investigate sites for potential farms. A few years prior, Passaconaway joined with other tribal leaders in deeding a large parcel of land to John Wheelwright—an Englishman who was exiled by the Congregationalist theocracy in Massachusetts—on which the latter founded the town of Exeter, New Hampshire.¹¹ Many Pennacooks, however, still populated the Merrimack Valley to the northwest, and continued to rely upon the river as they had for centuries.

The 1638 survey was captained by an Englishman named Woodward who brought four passengers to accompany him, including an Indian guide and a 15-year-old English map-maker named John Gardner. Together for two weeks they “penetrated the trackless wilderness of the Merrimack Valley nearly as far as Lake Winnepaukee.”¹² At the headwaters, they marked a tree and aptly named it “Endicott Tree” (the name Endicott meaning one who settles beyond the furthest cottage). Fourteen years later, Endicott Tree was replaced by Endicott Rock—a more permanent and obvious marker.¹³ This 1652 voyage by Captains Symon Willard and Edward Johnson formalized the findings of the initial survey and set the Massachusetts Bay Colony on a path toward settling interior New Hampshire.

As the Merrimack Valley grew more populated by English settlers throughout the eighteenth century, the river continued to be used for the two main purposes of fishing and transport. Like the Native Americans, English settlers depended on the stock of fish that inhabited the river. In fact, demand for fishing on the Merrimack was so high that in several places, authorities regulated fishing to just three days of the week and “on the lawful days scores of teams of every description, with drivers in picturesque and ludicrous costumes, came pouring in from all directions, eager to fill their carts for their own use, and for peddling about their neighborhood.”¹⁴

The river was also, of course, used as a means of transportation of goods and people between the Massachusetts Bay ports and the New Hampshire interior. Timber, particularly integral to the burgeoning shipbuilding industry on the coast, was one of the most valuable commodities to come out of the White Mountains. Merchants would float the logs—the longest and straightest of which were fit to become ship masts—down the river. As one historian observes, “they cannot all ‘head the procession,’ some strike a more rapid current than others, some meet with obstructions by which their advance is retarded or suspended, but the van moves steadily and rapidly on, and soon the river surface is thickly dotted with logs for a distance of from thirty to fifty miles.”¹⁵ Upon encountering rapids or falls, of which there are many along the Merrimack, the river men had their most challenging task: “‘Running the falls’ is a wild, exciting, and very interesting spectacle, lasting many days. Sweeping toward the head of the falls like a vast host in solid column, or like an Alpine avalanche, they plunge down the roaring, boiling, seething rapids in furious, headlong haste.”¹⁶ On the other side of this treachery was a calm reward – “soon after leaving Lawrence, the river shows the effect of tidewater very distinctly, its current being less perceptible, moving as a compact body rather than a collection of buoyant particles, sluggish and darker than when rippling and bounding



A statue of a Native American man now stands atop Endicott Rock in Laconia, NH.

over its rocky and descending bed.”¹⁷ Where the river meets the sea at Newburyport was a tremendous shipbuilding industry where logs could fetch great prices. Goods would likewise be shipped up the river to supply the towns in the Merrimack Valley.

As economic connectivity grew throughout New England, a cultural shift, too, was underway. The most major political and cultural change throughout the eighteenth century was, of course, the movement toward independence



Many parts of the Merrimack River are not easily navigable by boat.

and nationhood. As the British colonies morphed into an American republic, consequently the people turned from royal subjects to civic citizens. As historian J.M. Opal writes, “rejecting monarchy as both repressive and archaic, North American republicans invited ordinary men (and men alone) into the public realm of statecraft. By insisting that such people were capable of ‘public spirit,’ republicanism gave ‘honest’ folk a new image of themselves: guardians of the public good rather than dependent and infantilized subjects.”¹⁸ As Opal notes, this pivot toward the sovereignty of the people defined the self-concept of many Americans. As emigrants, and often radical reformers, many New England settlers were comfortable reaching beyond the social status prescribed to them by the British monarchy. Puritan culture had nonetheless remained largely bound to traditional family and religious structures. Only when a sentiment of national unity emerged after the Revolution did American identity start to take a new—more ambitious—form that looked beyond the household.

The idea of ambition did not sit well at first with many old-fashioned New Englanders. Many considered “ambition and virtue...as oil and water, or perhaps as fire and forest. Virtue summoned a man to a sense of public duty; ambition enticed him with the desire for public honor. Virtue was humble, candid, and selfless; ambition was haughty, malicious, and selfish.”¹⁹ In this way, the virtue of public duty was an appropriate aspiration for a young republican, whereas the honor sought by ambition was seen as a tasteless yearning for monarchical accolades.

The familiar ‘Protestant work ethic,’ raised children to be “diligent and patient in the work given to them.”²⁰ “These qualities,” writes Opal, “drew together in the word ‘industry.’ To be industrious was to be a reliable contributor to the working household, not a go-getter with discrete [capitalistic] aspirations.”²¹ Since provincial life revolved around the household unit—most often the subsistence farm—to look beyond these bounds, to be individualistic, to aspire to greatness was often seen as unscrupulous. Indeed, “pride, not greed, was the sin that New England children learned first and best. From pride grew ambition, the ‘predominant vice’ of adolescents and headstrong youth...the best answer to ambition, of course, was industry.”²² Here, Opal sets up an interesting and surprising tension between early American conceptions of industry and ambition. Soon enough, industry on the Merrimack River would surge precisely because of the capitalistic ambitions of its leaders. In the intervening decades, the two concepts would first have to reconcile.

This process was in part influenced by the introduction of Enlightenment ideas to the New England ethic. The concepts of and relations between the individual and the common good that were advanced by Enlightenment philosophers allowed Puritan conceptions of duty to loosen. As Opal writes, New Englanders began to see that “children were made not only for their families but also for ‘mankind in general.’”²³ Thus, the bounds of productive and virtuous work inched beyond the confines of the household.

As the nation became more unified politically, commercially, and culturally, it became more common and gradually more acceptable for young people to hold “personal ambitions that looked past the household altogether.”²⁴ Many started moving farther away from home to begin their lives, and populations started to concentrate in denser areas. Surely some arrived at an ambitious sensibility by way of desperation—we sometimes forget how plainly difficult the subsistence farming that engaged most early New England families was. It was often in the

For more on family farms in early New England, check out the Little Compton tour.



For more on the impacts of industry, check out the New Bedford tour.



best interests of parents to have a dozen children—to help with the work—until the children grew up and parents had to allocate their assets to the next generation, either in the form of a land parcel or a dowry. Constricted by the availability of fertile land, many New Englanders turned to trades for income, even if it was to break from familial tradition and duty. Eventually, “the commercial aesthetic of the new republic thus turned a social phenomenon—the growth of trade and population in town centers—into a measure of moral progress.”²⁵ It soon became virtuous to pursue ends beyond the household that served the greater good of society. In fact, many of the more “enterprising men were eager to announce the civic conscience behind their ambitious ventures.”²⁶

One such example to be found on the Merrimack River was a simple bridge in the town of Concord, New Hampshire. For most of the town’s history, a small ferry was the only way to cross the river which ran through the middle of the town. In the 1780s, when civic sentiment was strong (despite the economy being weak), a group of investors financed the construction of a bridge that would be available for public use and open lucrative new trading opportunities. In an expression of the demographic trend noted above, many of the proprietors of the Concord Bridge, “barely qualify as home-grown...in fact, fifty-four of the seventy-six investors (71 percent) were not Concord residents in 1790 [the year the bridge opened].”²⁷ The following excerpt describes the opening ceremony of the Concord Bridge:

After ten months of construction, the proprietors opened the bridge and announced the dawn of a new age. They had planned the spectacle three days earlier, and it would linger in local memory as a definitive moment. With townspeople watching, the sixteen proprietors walked across first, followed by Concord’s minister, who was also the largest shareholder. Next in line were the other shareholders, followed by the laborers...a shadowy group of workers who otherwise elude historical detection. At last, ‘the spectators in regular order’ crossed from both sides of the river, completing the enterprise and initiating the celebratory feast. The sequence of the event made clear who had done what for an enterprise that so easily passed as a public blessing. No one could object to a bridge that would collect no tolls while promoting trade and travel; even the ferry owner received handsome compensation for lost business. All the more reason, then, for those who had built the bridge—or, rather, those who had paid for it—to exhibit themselves as the virtuous few who had involved ‘their’ town in the larger work of enterprise.²⁸

As seen here, eighteenth century New Englanders inverted the traditional Puritan sense of ambition as vice by fusing it with a republican will for serving the common good. This was an important step not only in the development of American industry, but also of American identity and democracy. Going forward, Americans would retain this unique sense of public duty: “Beneath and against the relentless fanfare of enterprise, moreover, nineteenth-century Americans continued to convey the sensible and fundamentally democratic notion that commerce should serve the people, not vice versa.”²⁹

While the bridge in Concord was fundamentally changing townspeople’s interaction with the Merrimack River up in New Hampshire, a much bigger construction project was underway further downstream. Until the Pawtucket Canal broke ground, it remained that “the descent of the river at Pawtucket Falls was so precipitous,—the current so violent, and the channel so rocky,—that great difficulty was experienced in passing rafts down the rapids.”³⁰ Lumber traveling down the river was often offloaded onto land and pulled by oxen to circumvent these falls before heading back down the river east. To ameliorate this situation, an ambitious 1.5 mile canal was built that would bypass the falls and provide safe passage for boats, rafts and masts down the river. Construction of the Pawtucket Canal—overseen by the Proprietors of Locks and Canals on the Merrimack River—began in 1792 and was completed five years later with four locks to manage the 32-foot elevation drop. This canal was one of the very first built in America and allowed merchants to transport goods between the mountains and the coast with newfound ease.

This impressive feat of both engineering and financing left businessmen longing for even better access to markets—those more prosperous ports in Boston Harbor. Soon after the construction of the Pawtucket Canal, the much larger Middlesex Canal was conceived. It would extend 31 miles south, reaching the shipyards in Medford and eventually Boston Harbor. Construction was completed in 1804 for \$700,000.³¹ The canal was essentially a 24-foot wide, 4-foot deep ditch that carried the waters of the Merrimack and Concord Rivers to Boston Harbor and halved the travel time between Chelmsford (which would later become Lowell) and Boston. Barges pulled by horses could make the trip in just 2-3 days. Eventually steamboats

would travel on the canal but by the time that technology was widely available, it was more useful for an entirely different set of machinery that would radically change the course of the Middlesex Canal.

The railroad, ironically, ran an almost parallel course to the canal—and the canal was even instrumental in transporting building materials for rail construction. Unlike the ferry operator in Concord, no financial arrangements were made to support the proprietors of the canal and soon after the Boston-Lowell railroad took its first trip in 1834, the canal was rendered almost useless. Not only were the trains faster, but they could operate around the clock, unlike canal traffic which was limited by daylight hours and the capacity of individual locks. By 1853, navigation on the canal was entirely discontinued and large portions were subsequently filled in.³² Some sections still remain—including pieces of the Shawseen Aqueduct foundation which was built to carry the canal over an intersecting river. The monument to the Middlesex Canal seen below greatly understates the importance of this feat of civil engineering to the transformation of the region in the early republic. For more on the Middlesex Canal I strongly encourage a visit to the Middlesex Canal Museum in Billerica.



Middlesex Canal marker at Hadley Field in Lowell.



Shawsheen Aqueduct.



Remants of the Middlesex Canal at present day Mount Pleasant Golf Club.

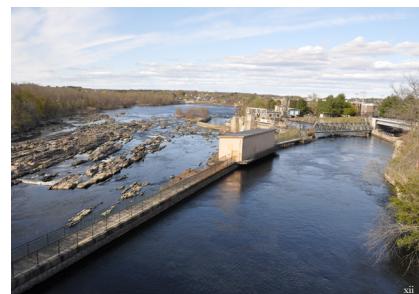
The beginning of the old Middlesex Canal actually lies about two and a half miles up the river from this gatehouse. The entrance to the Pawtucket is about 900' in the same direction. The canal seen moving parallel to the river here at this juncture is the Northern Canal—one of the several additional waterways eventually built to divert waterpower to industrial mills. It draws water from above the Pawtucket Dam and supplies the 5 mile network of power canals that weaves throughout downtown Lowell.

The Pawtucket Dam was built in 1825, two years after Lowell was incorporated as a town. Though it appears much calmer today, the large rock outcroppings now visible help us easily imagine the turbulence of the river when downstream water levels were significantly higher before construction of the dam. The dam now generates substantial hydroelectric energy for the city. The brick gatehouse seen here was built in the 1840s to control the flow into the Northern Canal—an important development that would help industrialists fine-tune their use of the Merrimack's power.

Though the Pawtucket Falls—and, more generally, the rapids all along the Merrimack River—were a liability for navigation throughout the eighteenth century, shrewd industrialists turned them into an asset for manufacturing power moving into the nineteenth.



The Pawtucket Gatehouse can raise and lower the dam to control how much water enters the city's industrial canal system.



The Northern canal (foreground) diverts water from above the dam to create a more navigable and useable channel than the rocky riverbed below.



Northern Canal Island

Northern Canal
Riverwalk, entrance
on east side of bridge



N ↑

While people had been extracting resources from the Merrimack River for thousands of years, the first canals in Lowell (Pawtucket, Middlesex, and then Western), along with Pawtucket Dam, now enabled them to derive capital far more efficiently. This technology allowed humans to control the flow of the river to suit the supply needs and aspirations of their industrial machinery. Ultimately, as industrialization accelerated to new heights and demanded more of the river's power on its own terms, industry—and the built community surrounding it—remained dependent on nature's will. Thankfully, many continued to regard the river highly reminding us of the fact that it was indeed "that noble artery of nature" whose waters "move the great wheels of her industry."³³ Others, including Henry David Thoreau, acknowledged more directly, and perhaps wistfully, the impact of industry on the river: "its real vessels are railroad cars, and its true and main stream, flowing by an iron channel further south...Instead of the scream of a fish-hawk scaring the fishes, is heard the whistle of the steam-engine arousing a country to its progress."³⁴ It was indeed a complicated and at times fraught relationship between the Merrimack River and the emerging industry that it powered.

Long before the first railroad arrived, mills had already begun to pop up along the shores of the river. Throughout the eighteenth century, sawmills, grist-mills, and powdermills used the river's rapids to power their machinery and manufacture goods for the local economy. Industry on the river began to really take off at the founding of the city of Lowell in 1823.

By the time the Boston-Lowell railroad arrived in 1835—it was one of the nation's very first—the landscape of the Merrimack River had already changed substantially. On Henry Thoreau's weeklong voyage up the Concord and Merrimack Rivers in 1839, he ruminated on nature, Classics, Native Americans, and other worldly themes, developing some of the foremost themes of Transcendentalism. The reflections in this book—while expansive and abstract in many ways—are also grounded in his observations of the natural environment of the two rivers themselves. In particular, he writes within the context of rampant industrialization on the Merrimack River, which he contrasts tightly with the more placid Concord River stemming from his hometown. Of the Middlesex Canal, on which he travelled briefly to connect the two rivers, he wrote: "there appeared some want of harmony in its scenery, since it was not of equal date with the woods and meadows through which it is led," clearly juxtaposing the natural forest with the unnatural built environment that cut through it.³⁵

Insofar as Thoreau's Transcendentalism was an expression of theology, it revered Nature as ultimately divine. This was not at odds with Christianity entirely, rather it was deeply connected to the emergent ideologies of Unitarianism and its predecessor Deism, which had begun to think of God in a more rational, liberal, and "natural" (meaning manifest in the natural, observable world) sense.

This reverence of divine Nature led Thoreau to view its disruptor, industry, as an arch foe. In many ways it seems like he found the unrelenting progress—the ambition—of the mid-nineteenth century exhausting. He turns to this boating trip with his brother to process and calm "all anxiety and stated toil...in the infinite leisure and repose of nature."³⁶ This is not in response



A railroad bridge crosses the river in Bedford, NH.



A beaver passes time in the wash of a man-made dam.

only to industrial progress, but to social progress as well. He writes, “it is a great pleasure to escape sometimes from the restless class of Reformers.”³⁷ Funny enough, many considered Thoreau and his fellow Transcendentalists to be part of the class of Reformers themselves. Not only were they exploring new theological directions – and often rebuffed by more traditional Congregationalist clergy – but they connected these themes more broadly to politics and became leaders in the regional movement for abolition and other lyceum topics.

American democracy at this time, as famously observed by Alexis de Tocqueville, was both a beacon of radical egalitarianism amidst an otherwise aristocratic West, and simultaneously a risky incubator of self-centered individualism. The social mobility promised by democratic governance and, in turn, the emergent honor inherent in work, contributed to a sense of restlessness among early Americans. Furthermore, industry promised a quicker (if riskier) path to prosperity than did farming. “Democracy, therefore,” writes Tocqueville, “does not simply multiply the numbers of workers, it leads men into one type of work rather than another. While it gives them distaste for agriculture, it does direct them toward commerce and industry.”³⁸ Tocqueville notes this trend with caution and describes the perils of prosperity in a manner reminiscent of the concerns about ambition that worried Puritan New Englanders in prior centuries. Ambition, particularly industrial ambition and its economic reward, held the power to corrupt both moral and political intentions as it scaled.

These tensions between nature and industry, between culture and progress, are illustrated in the story below:

In 1845, a group of Boston investors incorporated the Winnipissiogee Lake Cotton and Woolen Manufacturing Company of New Hampshire (Lake Company), which did not, in fact, manufacture anything. Rather, it owned the rights to lakes and other waterways in the region, amassing, by 1856, 103 square miles of control (Lake Winnipesaukee itself is 71 sq. miles.) The Lake Company also constructed dams to control the outflow of the lakes that supplied water to the Merrimack River. This fine-tuning of the landscape to suit industrial needs a hundred miles downstream provoked opposition from many New Hampshireites. When the dams were raised in winter and spring, farm fields were flooded. When they were lowered to increase flow in the summer, portions of the upper river were rendered unnavigable.

The cash consequences of the Merrimack’s flow stoked an emerging culture war between rural New Hampshire landowners and wealthy Massachusetts industrialists. This was manifest in New Hampshire’s law that granted landowners the right to destroy dams that flooded their properties. None took advantage of this law quite to the extent of James Worster, who repeatedly bought or rented land nearby dams owned by out-of-town industrialists and lodged attacks on their assets. Worster and his daughter Adeline took on the Lake Company, among others, with lawsuits claiming damages to their property inflicted by the dams. When the case failed in court, Worster turned to direct physical damage—dismantling flashboards and planking from the dam itself. Industrial lobbyists maintained a tight grip on their resources and the Lake Company even built security offices directly on top of the Lake Village Dam to prevent any further trouble. However, this did not stop Worster and his allies from leading an assault on the dam on September 28th, 1859. After a failed attempt in the morning, “fifty angry men with axes and iron bars bashed away at the hated structure” at nightfall in an effort to destroy the dam, drain their flooded farmlands, and achieve victory over the out-of-towners. The affair had prolonged consideration in court; ultimately Worster was imprisoned and fined and the Lake Company continued to control the waterways until the early twentieth century.³⁹

The island that separates the Northern Canal from the Merrimack River is yet another location at which nature and industry converge. This canal was one of the last to be built in the Lowell Power Canal System, with construction completed in the late 1840s. The project’s civil engineer, James B Francis, turned the island into a public promenade. Carefully landscaped trees lined a romantic riverside walkway to remind denizens of Lowell of a world beyond the planned industrial hellscape in which they lived.

More broadly, the field of landscape architecture was emerging all across the country around this time in large part as a reaction to industrialization, with Mt. Auburn Cemetery in Cambridge dedicated in 1831 and the famed work of Frederick Law Olmsted soon to come. Today, the Northern Canal Island continues to provide a walking path lined by trees but is markedly less manicured than Francis’ original park as can be seen on the NPS plaque on site.



The Northern Canal Promenade May, 2022.



Wannalancit Mills

660 Suffolk Street



At last, with the river's context in our pocket, we turn to the familiar history of Lowell that is most often told—that of the massive brick textile mills that rise several stories and turn these power canals into shadowy moats.

Lowell is widely known and celebrated as America's first industrial city. And it has no shortage of [local historians](#) proudly reviving this history for the public. If you are walking this tour as intended, you have probably already come across several signs from the [National Historical Park](#) describing the important sites. This abundance of public history is what makes Lowell both an excellent and a particularly tricky location for a tour like this. As you have hopefully seen by now, my goal with this website is to push place-based histories beyond local lore and to contextualize them within the greater historical landscape that is sometimes neglected in preference for more renowned stories. That said, some time is certainly owed to Lowell's unique claim to fame.

Lowell was a planned city, built by industrialists that sought to expand the aforementioned Waltham system of vertically integrated mills. This was possible at such a large scale in Lowell mainly because of the river site chosen. Not only did such control over the landscape promise commercial success, but it also offered an opportunity for "aesthetic and moral triumph over the old countryside."⁴⁰ Lowell sought to be both more prosperous than its peer towns in New England like Concord and more humane than the emergent industrial centers in England like Manchester. It was planned with near utopian precision and ambition. Not only did the machines themselves have to work perfectly, so too did the social order of the town.

Lowell's mill system was built primarily on two innovations, both of which originated in England: the spinning jenny and the power loom. The former mechanized the process of spinning fibers into thread, and the latter wove those spools into fabrics. Taken together, they constitute the vertically-integrated Waltham-Lowell system.

For centuries, textile production had been a hands-on labor-intensive artisanal craft with several discrete steps. First, raw fibers had to be cleaned and sorted, a process known as carding. They then had to be drafted, twisted, and wound into strands on spindles. The medieval invention of foot-operated flyers allowed these three steps to happen simultaneously and was commonplace in colonial American households despite being a technology several hundred years old. After spinning, taugh parallel yarns were fitted to a loom to create the warp, between which the weft was guided by heddles to create a woven textile. Mechanizing these steps incrementally elevated an ancient domestic handicraft to an industrially produced commodity.⁴¹

Professional spinners and weavers often spoke out against new inventions for fear of job losses brought on by new efficiencies. Nonetheless, English inventors at the forefront of the industrial revolution continued to work toward upending the methodology of textile produc-



Wannalancit Mills, built as Suffolk Mills in the 1830s and later renamed after the son of Passaconaway, has since been converted into office space.

tion. The spinning jenny, invented in the 1760s, allowed its operator to work several spools simultaneously. The water-powered Arkwright system that came along by the end of that decade improved on this technology and others, synthesizing several different components into a complex system. Soon the spinning mule came along as well, continuing to improve upon the nascent technology. Such machines “required a new kind of worker – the unskilled operative whose labor was paced, for the first time in history, by the constant demands of mechanized production.”⁴²

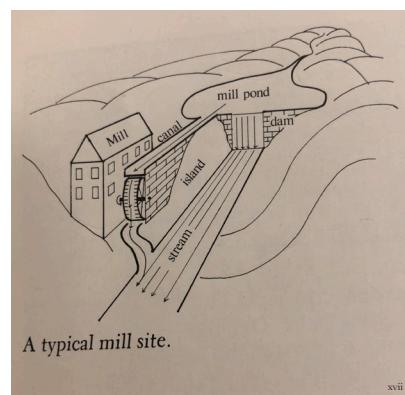
As manufacturing technology began to transform both the economy and culture of England, Americans—subjects of the British crown with growing resentment—watched closely. There was plenty of disagreement among Americans as to whether such industrialization was desirable in the new world. Did it promise to bring prosperity or corruption, opportunity or vice, independence or reliance? Soon enough, northerners gave into curiosity and market forces and sought to bring mechanized textile production across the Atlantic. The endeavor was mixed in its tactical approach: “grants supported local experimenters while bounties encouraged technological espionage,” writes Steve Dunwell.⁴³ Americans replicated the jenny fairly quickly but the more comprehensive Arkwright system proved to be a much tougher nut to crack. Rhode Islanders Almy and Brown came close but it was the help of Samuel Slater—an English millwright who covertly brought blueprints across the ocean—that made it finally work. Soon enough, Slater’s mill in Rhode Island boomed and attracted the attention of many aspiring industrialists all across New England. This mill model was largely dependent on child labor to operate spinning machinery. Spools were then either hand-woven into textiles in house, or sold on consignment to home weavers. The operations of the mill shaped the entire town around it and cultivated a growing mutual dependence between young workers, their families, and the mill owners who administered almost all aspects of their lives. As Dunwell writes, “dividing their time between crowded tenements and the hostile interior of the factory, workers may have preferred the industrial life-style over the rigor and hardship of New England farming, but it was often only marginally attractive.”⁴⁴ Nonetheless, it was a hub for production and a model for growth. Ambition radiated from Slater’s Mill. As aspiring industrialists tried to replicate Slater’s success all throughout the region, it was determined that four elements were essential to a successful new mill: waterpower, labor, capital, and machinery.

Most notably, at this bend in the Merrimack River could be found one of the best water-power spots in all of New England – the precipitous Pawtucket Falls. Dunwell writes, “even a primitive wooden wing dam across the top of the rapids could draw off as much as three thousand potential horsepower—enough for fifty mills on the Waltham scale.”⁴⁵

Labor was reliably found in the form of workers seeking opportunity beyond the confines of their rural farm communities. With no nearby port cities to provide competing economic opportunities, Lowell was in a prime location for attracting labor—particularly by young women who soon came to be known as mill girls. In contrast to the exploitative child labor upon which the Rhode Island model had relied, mill girls brought rectitude to Lowell’s factories: they were “intelligent and dexterous” as well as “well educated and virtuous.” They “matched the machine perfectly.”⁴⁶ The women, too, stood to benefit from coming to work in Lowell’s factories—the job was a rare opportunity to look beyond their homesteads. For many mill girls, “tenure at Lowell was more than just a job, it was an education.”⁴⁷

There was no shortage of capital from The Boston Associates, a group of investors eager to fund new industrial development in the region when the circumstances aligned. And the circumstances most certainly aligned for the town of Lowell, which was built on its namesake’s integrated technology, family reputation, and previous business success.

It was the Waltham power-loom that was Francis Lowell’s most exceptional contribution. Quite



Waterpower: a diagram of how mills typically used canals.



Labor: a mill girl operates a spinning jenny.

similar to the Cartwright system that had emerged in England, Lowell also managed to mechanize both spinning and weaving together. Unlike spinning where efficiency came from completing steps simultaneously, the discrete steps of weaving had to be done in sequence. This made it a much more difficult engineering puzzle to solve. Looms had to complete the steps of “shed-changing, weft-insertion, beating, and cloth take-up” with great precision in order to produce a workable textile.⁴⁸ That feat was accomplished by Francis Lowell’s Waltham system. Shortly after Lowell’s death in 1817, his associates embarked on a new venture in his name, incorporating the Merrimack Manufacturing Company in 1822 and the town of Lowell in 1823. which would become a textile manufacturing hub designed to capitalize on this technology.

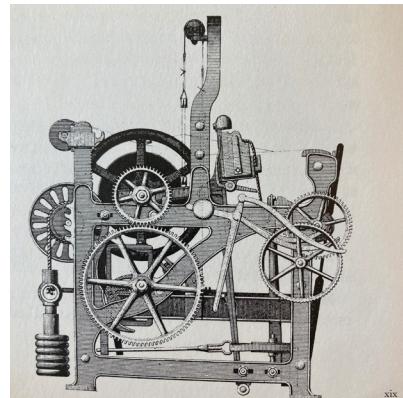
Soon enough, Lowell did indeed become a manufacturing center and many more mills joined the Merrimack Manufacturing Company to capitalize on the waterpower, labor, and machinery available. Yet the original corporation remained among the most prosperous. As Charles Cowley wrote in 1869, “For many years, fabrics bearing their imperial name [Merrimack Manufacturing Company] have commanded a cent a yard more than the fabrics of other companies equal in cost and equal in intrinsic quality.”⁴⁹ Not only did the Boston Associates manage to make a return on their investment in a risky emergent industry, but they also cultivated a prestigious reputation in an age that largely predicated commercial advertising.

As “the most astonishing industrial city in American history,” Lowell led the regional textile industry which increased its production fifteen-fold between 1820 and 1860.⁵⁰ In 1850, 896 mills were in operation in New England, many of which were on the Merrimack.⁵¹ As more and more mills popped up, controlling the flow of water that powered them became all the more competitive. The Lowell power canal system, owned and operated by the Proprietors of Locks and Canals, consists of over five miles of canals that reroute water from the river

to supply the wealth of mills built a few blocks from inland. These man-made canals provided the opportunity for more precise control over power supply to factories and allowed millwrights to optimize their operations. As noted in the previous story of the Lake Company, control over the watershed extended much farther upstream as well. By 1868, the Merrimack River had been engineered to supply Lowell’s factories with nearly ten thousand horsepower, roughly three times the output of the average windmill built in 2020.⁵²

In the second quarter of the nineteenth century, spirits in Lowell were high. All eyes were on this “shock city of Jacksonian America.”⁵³ Many

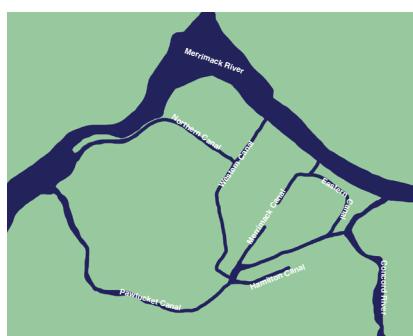
regarded its surge as “one of the grandest epochs in the progress of mankind...the most elaborate and mature system of industry the world has ever seen.”⁵⁴ On one hand, “The machinists’ creations seemed ‘gifted with intelligence.’ Americans beheld the mechanized mill interior with ‘admiring wonder’ and judged it ‘one of the marvels of the world.’ The machine promised to liberate humanity from needless toil and drudgery, joining its hum with the roar of the waterfall to sing a song of triumph and exultation at the successful union of nature with the act of man.”⁵⁵ Yet on the other hand, some were more skeptical of this notion of progress. To them all of the industrial development had made the landscape almost unrecognizable: “it was no longer possible to look past the factories to the river beyond. The mills created an almost solid wall between the city and the river.”⁵⁶ Such is the never-ending friction of change.



Machinery: Side view of Horrock's power loom, similar to the design patented by Francis Cabot Lowell.



Capital: seal of the Merrimack Manufacturing Company.



Map of the Lowell power canal system as it is today



Boott Mills

115 John Street



Let us once again visit sagacious Tocqueville to understand the complexities of emergent industry here on the Merrimack. Though Tocqueville did not visit Lowell on his famed 1831-32 journey during which he gathered notes for *Democracy in America*, his ruminations on “how an aristocracy may emerge from industry” nonetheless feel remarkably germane to the situation here. He identifies two principles as crucial to efficiency and growth in industry: siloed repetition of a singular process by workers and maximal scale of production overseen by employers. The application of these practices to politics is what concerns him, as he foresees greater specialization and scope leading to greater stratification among individuals. Tocqueville is skeptical of industry here, fearing that it would erase much of the social equality and commonality on which American democracy is founded.

Since such a process was to come from capitalistic innovation and not from feudalistic ownership, Tocqueville didn’t anticipate as rigid of a social class system emerging as he had seen in European aristocracies. American industrialists, eager to prove their nation could deliver on the ideals it so radically articulated 50 years prior, similarly stressed the importance and virtues of social mobility. In fact, this perspective led them to view extremely high turnover in their factories as beneficial since it was understood to prevent the formation of a “helpless caste” that would undermine the national project.

However, as with many new technologies, textile mills proved transformative to society in ways more profound than any could anticipate. With the advantage of hindsight, Dunwell writes that “this industrial growth was part of a rapid and decisive evolution of American society as the liberal spirit of the eighteenth century gave way to the exploitative drive of the nineteenth.”⁵⁷ To many, this may be a more familiar take on how we have now come to see the effects of industry on workers. It is important to remember that the often harmful effects of this industry on individuals complicate, but do not negate, the tremendous positive impact that it had more broadly on our development as a country.



Boott Mills is a fantastic study in what daily life looked like for mill employees in the mid-nineteenth century. It remains the most intact mill complex in Lowell, and has been converted into apartments, offices, and museum space for the National Historical Park. Lowell’s mills were unique not only in how they manufactured textiles, but also in how they managed their employees—the first generation of factory workers in America who were bound to “the constant demands of mechanized production.”⁵⁸ Millwrights had the authority and incentive to oversee all aspects of employee conduct. This can be seen clearly in the architecture of Boott Mills’ courtyard, at the center of which stands a bell tower that would announce to its patrons the rigid rhythms of the workday. An NPS plaque in the courtyard shows how Boott Mills began as four separate buildings in the 1830s, between which one could see both the Merrimack River and the Eastern Canal. From the 1840s through the 1870s, new construction gradually

encroached on this open space, boxing in a millyard insulated from the water on its north and south. Almost entirely hidden from view, one can easily forget about the rest of the city of Lowell when in the middle of Boott Millyard. Inside the [museum](#) is a weave room exhibit with power looms from the 1920s that are still in operation, along with lots more information particularly on the daily lives of mill workers, many of whom were immigrants.

Within the individual mills, too, was an opportunity for industrialists to exert paternalistic control over every detail of employees' operation. As Dunwell writes, "it is the millwright, not the architect, who determines the mill's form."⁵⁹ Design was starkly utilitarian in nature, with every component fine tuned for efficiency. This manner of conduct, which may seem almost obvious in today's hyper-optimized surveillance state, was at the time a stark departure from the modus operandi of detached family farms. Even earlier mills like Slater's had more closely resembled familial organizational structures than the purely industrial ones that were now emerging in Lowell.



All of this was in service of efficiency and financial prosperity, which became increasingly difficult as competition increased and profit margins grew slimmer. Aware of the potential for economies of scale, it didn't take long for factories to "become pawns in much larger capitalistic schemes."⁶⁰ When such development became detached from the ground it was built on, and it veered into the world of speculation, outcomes were less predictable. Take the example of the city of Lawrence, a mill town that attempted to replicate Lowell's success about thirty miles downstream. A cadre of investors from Boston, led by Abbot Lawrence, sought to build "an imperial manufacturing city," from the ground up.⁶¹ Development of Lawrence would require significantly more initial investment but promised even greater reward, a risk that the Boston investors were eager to take, but would soon come to regret. Between 1845 and 1849, the Essex Company—incorporated for this sole purpose—built "a skeleton city." Despite millions of dollars of investment, the project did not turn out to be economically feasible. Competition was tough: "squeezed between high prices for raw cotton, low product demand, and excess production capacity, New England mills paid dearly for their overexpansion."⁶² Lawrence's investors lost at least six million dollars in this failed experiment and proved that even with waterpower, machinery, and capital, a mill could get nowhere. That fourth puzzle piece of labor continued to be integral to the prosperity of the industry going forward. In this environment, workers gained more leverage and started to organize into the beginnings of an industrial labor movement that would continue to pick up steam as the nineteenth century progressed.

The American Civil War also complicated things for these manufacturers of cotton textiles. Raw fiber prices had grown increasingly volatile as sectional divisions between north and south grew more pronounced. When war eventually broke out, northern mill personnel had to pick sides. Workers tended to stay loyal to the union, while many mill owners became southern sympathizers to preserve their business interests. Nine mills in Lowell made the unique choice to cease production entirely during the war, expecting it to become utterly infeasible anyway. This decision ended up being a "stupendous blunder" that alienated workers, driving many out of town, and brought disastrous financial outcomes to the city's textile industry.⁶³

At the same time, the growing ubiquity of the industrial steam engine lessened the imperative that a successful mill town be located on an ideal waterpower site: "While waterpower had led to a dispersion of isolated factories, steam mill economy favored concentration at a few coastal locations where transportation costs were minimized, labor was plentiful, and local investment capital was available."⁶⁴ These forces allowed other cities like Fall River and New Bedford, that were well-positioned for shipping, to thrive in textile production as Lowell stagnated. Its textile industry did continue to plod along into the twentieth century, though it had long been clear that the days of the Merrimack's biggest surge were over.



Concord River Greenway

15 Davidson Street



Here we arrive at a different river, the Concord River, which appears quite placid in comparison with the Merrimack. With this tour I originally set out to write a history of the Merrimack River, a story in which the Concord River plays a supporting role. It is a tributary of the Merrimack and was a major source of water supply for the Middlesex Canal. It was also the co-subject of Thoreau's 1849 book. It is the Transcendentalist themes approached in this work that help us think about the relationship between systems of natural ecology and those of human industry, which are not, after all, diametrically opposed. As we look at the rivers today, both the Merrimack and the Concord, it is clear that these formidable natural sources continue to exert influence on the communities surrounding them. Though by this point far removed from the surge of the early nineteenth century, much of the textile mill infrastructure is still in use today by the city of Lowell and other towns along the river.

Remember, though Lowell can be thought of as an inflection point in the history of the river, it has had significant bearing on both the interior of New Hampshire and the coast of Massachusetts as well. More than anything, it made a certain type of New England industrialization possible in the opening decades of the nineteenth century when everyone from old-fashioned Puritans to southern agrarians to speculative capitalists were unsure of the consequences of such development.

Perhaps we wound up with a different type of commerce than the early anecdote about the Concord Bridge would have suggested—one that was less civic-minded and more interested in single-minded profit. Perhaps we wound up with a commerce more similar to Tocqueville's warnings—one that was exploitative of its workers and undermined the American promise of social mobility. Perhaps this is the natural course of industry. This tour has intentionally remained neutral on this point, preferring to examine the causes of industry rather than its effects. Much has been said on the social history of the New England textile industry, particularly by Lowell public historians. Moving stories of mill workers and immigrant communities comprise much of the interpretation offered by the Lowell National Historic Park—I suggest starting there for more on that topic. Here, hopefully, you have found some sense of the power of the Merrimack River and its surge that brought the surrounding towns rushing into the nineteenth century.



Many old mill buildings in Lowell have been put to adaptive reuse such as condominiums.



Looking quite different than it does in Lowell, the Merrimack River enters the Atlantic Ocean at Newburyport, Massachusetts.

Thank you for completing the tour!
[Return to website here.](#)

Endnotes

- 1 George Waldo Browne, *The River of Broken Waters: The Merrimack* (Manchester, NH: Standard Book Co., 1918), 19..
- 2 Ibid., 25.
- 3 Dena Ferran Dincauze, *The Neville Site: 8,000 Years at Amoskeag, Manchester, New Hampshire* (Cambridge, MA: Harvard University Press, 2005).
- 4 J.W. Meader, *The Merrimack River: Its Source and Its Tributaries* (Boston: B.B. Russell, 1869), 242.
- 5 Jill Lepore, *The Name of War: King Philip's War and the Origins of American Identity* (New York: Vintage, 1998), 29.
- 6 Ibid., 37.
- 7 Meader, 243-44.
- 8 Arthur L. Eno ed., *Cotton Was King: A History of Lowell, Massachusetts* (Somersworth, NH: New Hampshire Pub. Co., 1976), 7.
- 9 Ibid.
- 10 Henry David Thoreau, *A Week on the Concord and Merrimack Rivers*, Carl Hovde, William Howarth, Elizabeth Witherell eds. (Princeton, NJ: Princeton University Press, 1980), 146.
- 11 Richard Howe, "The Wheelwright Deed," *RichardHowe.com*, July 17, 2021, <https://richardhowe.com/2021/07/17/the-wheelwright-deed/>.
- 12 Browne, 11.
- 13 Ibid.
- 14 Meader, 248.
- 15 Ibid., 286.
- 16 Ibid.
- 17 Ibid., 292.
- 18 J.M. Opal, *Beyond the Farm*, (Philadelphia: University of Pennsylvania Press, 2008), 7.
- 19 Ibid.
- 20 Ibid., 26.
- 21 Ibid.
- 22 Ibid., 30.
- 23 Ibid., 70.
- 24 Ibid., 45.
- 25 Ibid., 67.
- 26 Ibid., 54.
- 27 Ibid., 51.
- 28 Ibid., 52.
- 29 Ibid., 191.
- 30 Charles Cowley, *Illustrated History of Lowell*, second revised edition (Lowell: B.C. Sargeant and J. Merrill & Son, 1868), 24-25.
- 31 Ibid., 26.
- 32 Ibid., 27.
- 33 Ibid., 2.
- 34 Thoreau, 87.
- 35 Ibid., 62.
- 36 Ibid., 125.
- 37 Ibid., 126.
- 38 Alexis de Tocqueville, *Democracy in America; and, Two Essays on America*, trans. Gerald Bevan (Penguin, 2003), 641.
- 39 "The Winnipesaukee Water War and the 1859 Fight for NH Property Rights," New England Historical Society, <https://www.newenglandhistoricalsociety.com/winnipesaukee-water-wars-fighting-nh-property-rights/>
- 40 Opal, 157.
- 41 Steve Dunwell, *The Run of the Mill: A Pictorial Narrative of the Expansion, Decline and Enduring Impact of the New England Textile Industry* (Boston: David Godine, 1978), 6.
- 42 Ibid., 9-10.
- 43 Ibid., 12.
- 44 Ibid., 4x.
- 45 Ibid., 4x.
- 46 Ibid., 32.
- 47 Ibid., 47.
- 48 Ibid., 29.
- 49 Cowley, 48.
- 50 Dunwell, 37; 51.
- 51 Ibid., 51.
- 52 According to the Department of Energy, the average windmill built in the US in 2020 had a nameplate capacity of 2.75 megawatts. <https://www.energy.gov/eere/articles/wind-turbines-bigger-better>
- 53 Dunwell, 42.
- 54 Cowley, 28.
- 55 Dunwell, 54.
- 56 Ibid., 68.
- 57 Ibid., 51.
- 58 Ibid., 9-10.
- 59 Ibid., 24.
- 60 Ibid., 88.
- 61 Ibid., 82.
- 62 Ibid., 84.
- 63 Cowley, 48.
- 64 Dunwell, 104.

Image Sources

i Photo by the author.

ii <https://blogs.lowellsun.com/history/files/2017/05/passaconaway.jpg>

iii <https://forums.arrowheads.com/forum/general-discussion-gc5/native-american-arrowheads-other-lithic-artifacts-gc7/181755-flint-artifacts-from-new-england>

iv <https://www.cowasuck.org/facts/wigwam.html>

v <https://blog.education.nationalgeographic.org/2014/11/21/you-wont-believe-the-source-of-the-worlds-most-sustainable-salmon/>

vi <https://www.winnipesaukee.com/forums/showthread.php?p=13016>

vii-xvi Photos by the author.

xvii-xx Steve Dunwell, *The Run of the Mill: A Pictorial Narrative of the Expansion, Decline and Enduring Impact of the New England Textile Industry* (Boston: David Godine, 1978).

xxi-xxvi Photos by the author.