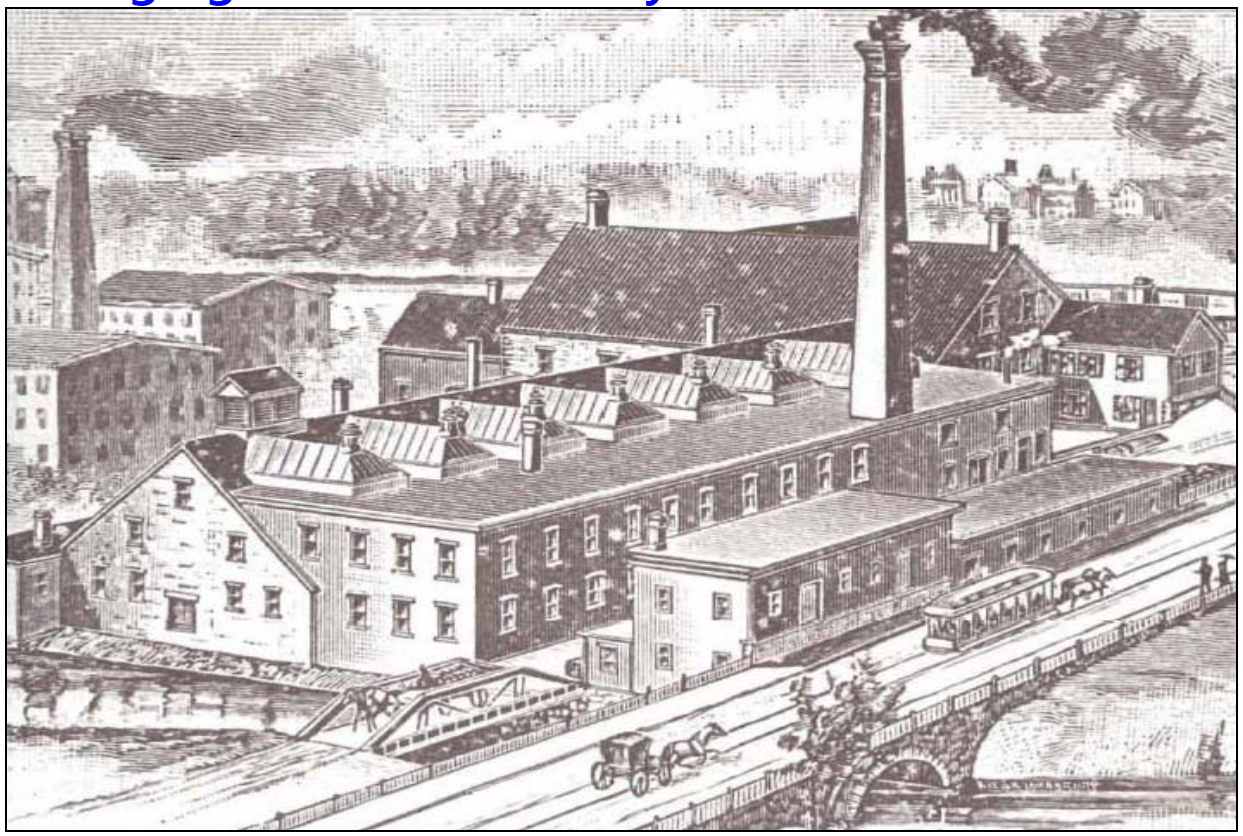
Changing Course: A History of River Meadow Brook



Former Whipple's Mills at Lawrence Street, crossing River Meadow Brook, ca. 1880, *Lowell Mail Souvenir*

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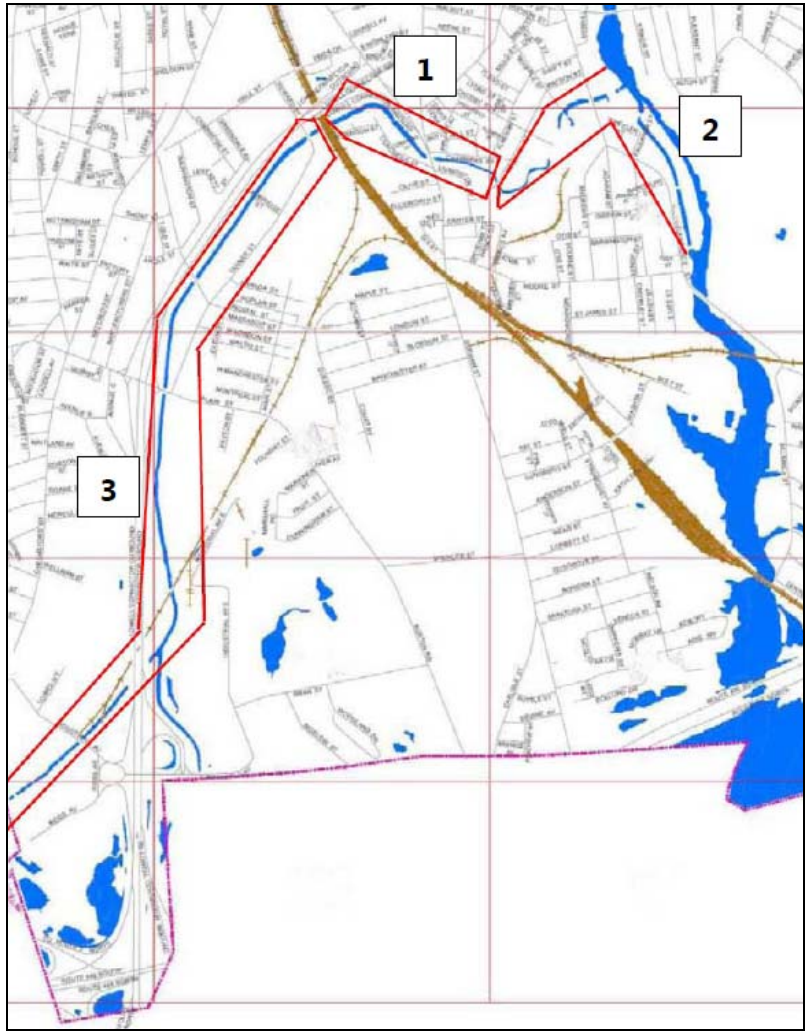
INTRODUCTION

In addition to the two major and well-known rivers, the Merrimack and the Concord, that flow through Lowell, there are a number of brooks that meander through marshy areas, neighborhoods, and formerly industrialized sections of the city. Two of these small streams, River Meadow Brook, which extends through the southern part of Lowell and into the Concord River, and Beaver Brook, which winds through Dracut and the Pawtucketville neighborhood of Lowell and into the Merrimack River, once included stretches of factory buildings and provided water power and boiler water for steam power for a number of these mills.

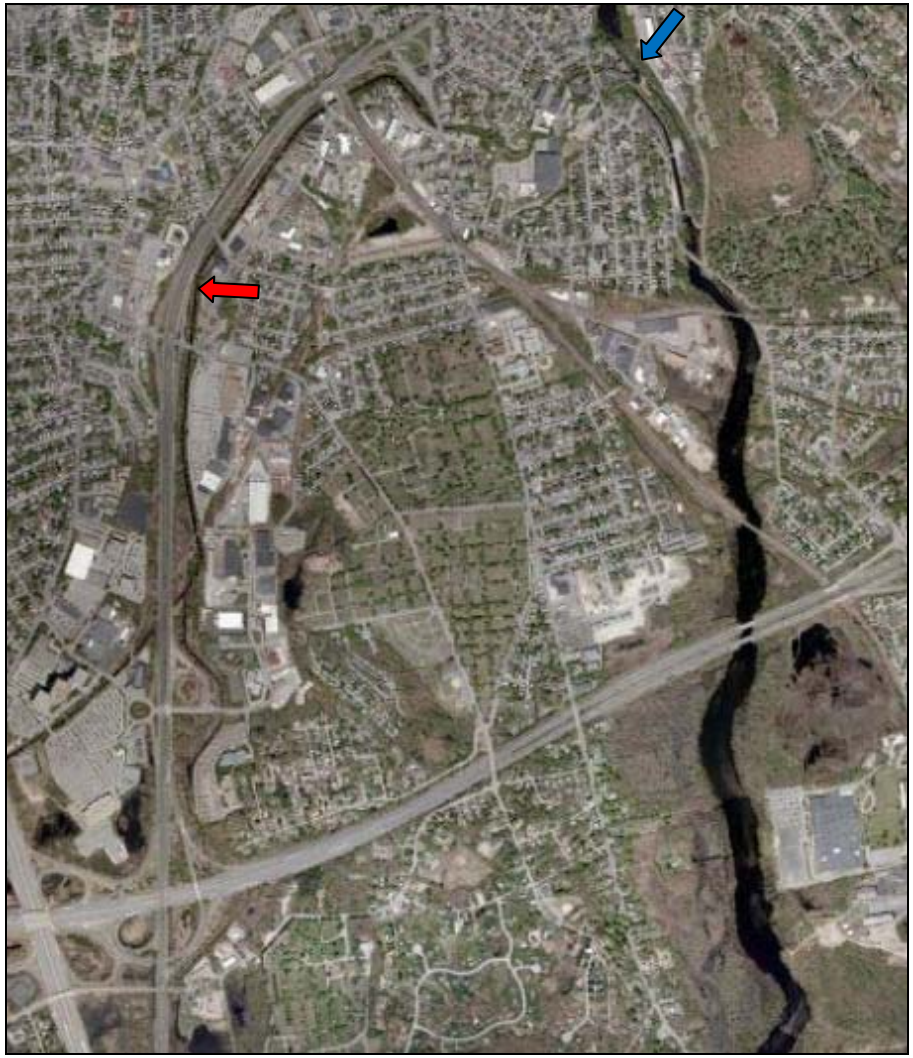
Today, much of the industry is gone. These waterways, however, continue to be largely neglected or ill-treated tributaries to rivers that, by contrast, are being recognized for their natural beauty and the fundamentally important role they play as part of a healthy ecosystem. At long last interest is blooming in restoring these streams to an equally healthy condition. As a first step in this process, this study examines the history of land and water use associated with River Meadow Brook. Its focus is on the nearly 2.5 mile stretch of this stream as it enters Lowell from the south at the Chelmsford line, flows north alongside the Lowell Connector highway, and then arcs eastward in its modest descent into the Concord River.

Geographic Districts and Methods

The survey area has been divided into three geographic districts that conform, to some extent, to the historic uses of the land along the brook. These districts include: (1) Hale's Mills; (2) Wamesit Canal and Bleachery; (3) Ayer's City.



This map shows the three geographic districts created for the organization of this report: (1) Hale's Mills District; (2) Wamesit Canal and Bleachery District; (3) Ayer's City District.



Satellite image of River Meadow Brook (red arrow) as it flows through Lowell and empties into the Concord River (blue arrow).

This project was divided into three major phases: (1) field work and photography; (2) library and archival research; (3) the writing of this report. Among the most important sources consulted were map and atlas collections at the University of Massachusetts Lowell's Center for Lowell History, Lowell's Pollard Memorial Library, the digital map collection at Harvard University, and the digital Levanthal Map Collection at the Boston Public Library.

In addition, periodicals, especially local newspapers, were extensively researched. Also especially important were the digitized property deeds of the Northern Middlesex Registry of Deeds in Lowell. Finally, a number of published local histories of Chelmsford and Lowell were consulted in the research on individuals and companies that were significantly involved in land ownership and development in the study area.

Invaluable assistance for this project was provided by Jane Calvin, executive director of the Lowell Parks & Conservation Trust, Lori Weeden of UMass Lowell's Department of Environmental, Earth and Atmospheric Sciences, Richard Howe, Jr., Register of Deeds, Northern Middlesex Registry of Deeds, Martha Mayo, of UMass Lowell's Center for History, Dr. Patrick Malone, of Brown University, and Charles Parrott, of Lowell National Historical Park.

Part I: Geology and Early History of the Brook

With headwaters at Heart Pond (which was also known as Baptist Pond) in Chelmsford, Massachusetts, River Meadow Brook, also called Hale's Brook, flows nearly six miles through parts of Chelmsford, Carlisle, and Lowell, where it empties into the Concord River.[1] Along the way some six brooks, including House, Patch Meadow, Farley, Putnam, Beaver, and Golden Cove, feed into the meandering stream. River Meadow Brook drains an area of nearly 24 square miles, including Tophet Swamp in Carlisle. Entering Lowell in the southwestern section of the city, the brook flows about 2.5 miles, extending northward along the Lowell Connector, this section of the stream having been relocated and straightened in conjunction with the highway construction in the early 1960s. It then turns abruptly to the east, descending nearly 15 feet over the last half mile, before its confluence with the Concord River.

Geologists in the 19th century, most notably Nathaniel S. Shaler of Harvard College, pointed out that part of the River Meadow Brook Valley was the pre-glacial channel of the Merrimack River, which, in turn, was a tributary of what would become Boston Harbor. But it was William O. Crosby, a geologist at the Massachusetts Institute of Technology, who did the most extensive amount of field work in the Lowell area. Using data from test borings that were done for the city of Lowell in developing a well field along the brook in the 1890s, Crosby noted that a "deep rock valley" underlay River Meadow Brook. Crosby found that in the vicinity where Plain Street crossed the stream "bed rock was reached at 83 feet, or about 73 feet below the level of the Merrimack, and 19 feet above low tide." He concluded that the pre-glacial Merrimack most certainly flowed "southeastward from River Meadow Brook" where there is found "a direct and unobstructed course for its buried gorge."[2]

The gigantic ice sheet, which, until the late Pleistocene era, covered much of North America reshaped land and streams, carving out valleys while moving vast quantities of rock and earth. Advancing and retreating glaciers scoured the land and deposited a massive amount of sediment, one result of which was the alteration in the course of the Merrimack River. Instead of flowing through the pre-glacial valley to the

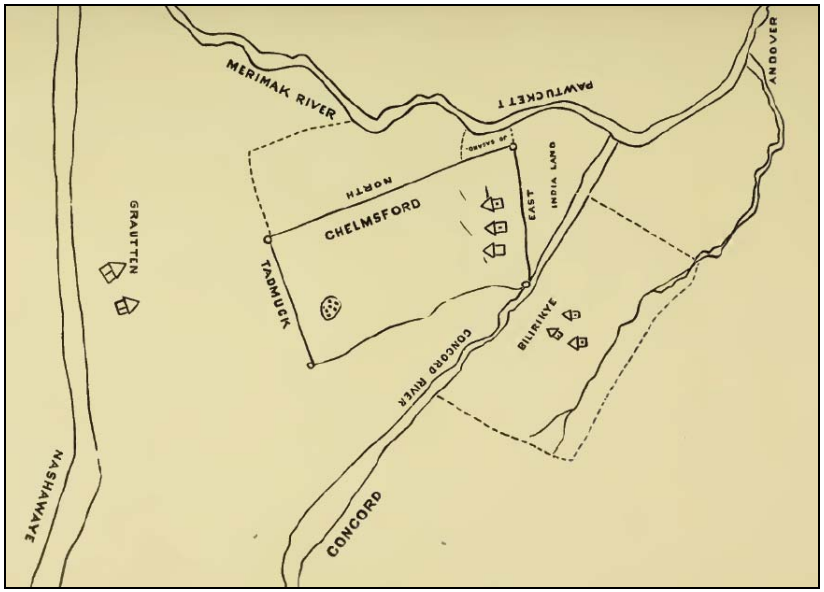
[1] Early descriptions of River Meadow Brook note that it originates at the outlet of Heart Pond. See, for example, T. J. Pinkham's letter, titled "River Meadows" and dated February 18, 1859, to the editor of the *New England Farmer*, v. 11, (Boston, 1859), p. 207. However, in a U.S. Geological Survey (USGS) report produced by C.H. Pierce and H.J. Dean, titled "Surface Waters of Massachusetts," *USGS Water Supply Paper 415*, (Washington, D.C., 1916), the brook's source is identified as being "about three-fourths mile southeast of Nashoba [Carlisle Station] at altitude 220 feet above sea level." This paper appears to draw from the earliest topographic map of Lowell, produced by the USGS in 1893. But more recent USGS maps clearly show Heart Pond as the headwaters of the brook.

[2] W. O. Crosby, "Geological History of the Nashua Valley during the Tertiary and Quaternary Periods," *The Technology Quarterly and the Proceedings of the Society of Arts*, v. 12, (Boston: 1899), especially pp. 301-302. Glacial action in the Merrimack River Valley has long interested amateur and professional scientists alike. For an early study of the Pleistocene-era valley in the vicinity of Concord, New Hampshire see William Prescott, "On the Alterations of the Channel of the Merrimack River: Read before the New Hampshire Historical Society at its Annual Meeting, in June, 1853."

southeast, the river turned abruptly north and east, its waters streaming beyond Lowell and toward the sea. Around 11,000 years ago the first humans moved into this area as a boreal forest was overspreading the vast stands of spruce and pine.[3]

Prior to English settlement in the area that became Chelmsford in the 17th century, many generations of Native Americans hunted and foraged in meadows, bogs, and forests in the vicinity of River Meadow Brook and fished in the stream. A number of tribes settled in or moved through this area. These tribes, identified by Europeans as members of the Pennacook Confederacy, included the Pennacooks, the Wamesits, the Pawtuckets, the Nashobas, and the Souhegans. As historian Frederic Burtt noted, their language was of Algonquian origin, which comprised many dialects. In the vicinity of the Concord and Merrimack rivers, Indians worked the land and grew a variety of crops, notably corn, squash, and beans. Through controlled burns, they cleared vegetation and trees, keeping fields open for hunting game, and fostering the growth of edible fruits and berries, as well as for growing their crops. Although the population fluctuated over the course of each year, in spring large numbers of Indians from various tribes gathered for the fishing season at Pawtucket Falls where an abundance of salmon, shad, sturgeon, alewives, and eels were caught and eaten or preserved by smoking.[4]

[3] Brian Donahue, *The Great Meadow: Farmers and Land in Colonial Concord*, (New Haven, CT: 2004), pp. 36-37.
[4] J. Frederic Burtt, "Passaconoaway's Kingdom," in Arthur L. Eno, Jr., *Cotton was King: A History of Lowell*, Massachusetts, (New Hampshire Publishing Co., 1976).



As shown in this plan of Chelmsford from ca. 1655, a part of River Meadow Brook was within the "India Land" known as the Wamesit Reservation, a large irregular triangular parcel that extended west and southwest from the confluence of the Merrimack and Concord Rivers. (Source: Wilson Waters and Henry Spaulding Perham, *History of Chelmsford, Massachusetts,* 1917, p.7)

According to some of the earliest accounts of English colonists, Pawtuckets were numerous along the Concord River in the area which, two centuries later, would become Lowell. As many as 2,000 Pawtucket Indians lived here prior to Native American contact with Europeans. They established villages that included longhouses, built of logs, wooden poles, and covered with bark, and were located near their cultivated fields. Much of the early exchange between Englishmen and Indians centered on the trade for beaver skins and other animal pelts. This

commercial exchange intensified throughout much of the 17th century as European demand for fur grew and pushed English traders ever deeper into the hinterlands. As early as 1635, Simon Willard of Cambridge established a trading post in the Musketaquid Valley, the Indian name for grassy plain. A settlement the English called Concord took root here. Willard and his fellow traders journeyed along the Concord River to its confluence with the Merrimack and beyond Pawtucket Falls, north to the lakes region of New Hampshire.[5]

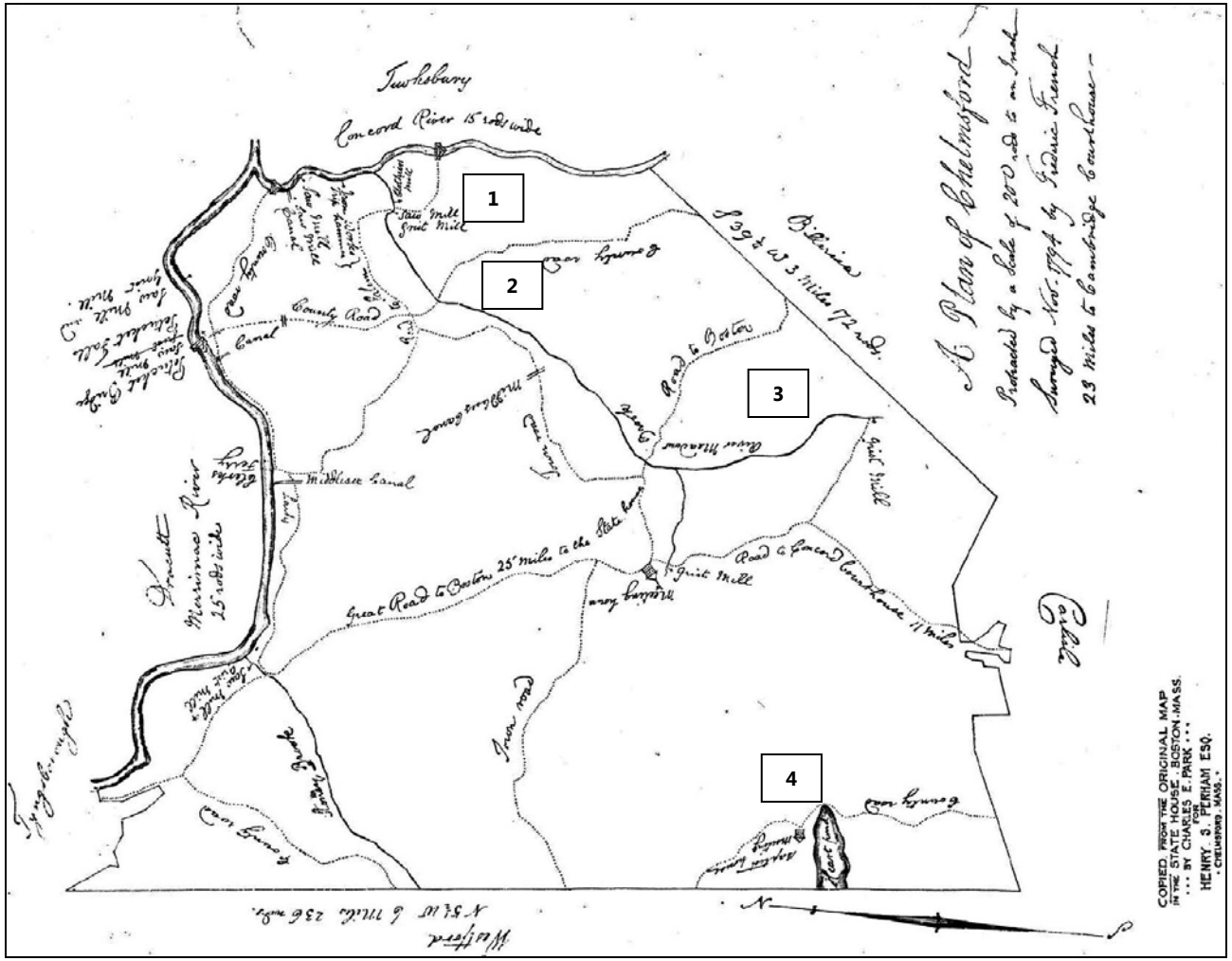
By the late 1640s John Eliot, an Episcopal clergyman from Roxbury and one of the few Englishman who became proficient in the Algonquian language, established a series of "praying villages" to teach Native Americans the Christian faith. One of these villages was located at Wamesit, an area extending on both sides of the Concord River, west and north toward Chelmsford neck. On a hill south of the Merrimack River and west of the Concord, Eliot had a log building constructed to serve as a meeting house and dwelling during his visits to the Wamesit grant. Eliot's ministerial labors among the Indians helped bring about a longer-term native settlement at Wamesit. At the same, however, a growing number of whites claimed land and began to clear and farm the area west of Wamesit.[6]

This illustration depicts the meeting house at Wamesit erected in the 1650s under the aegis of Reverend John Eliot. It stood until the 1820s and its location is near the site of the Eliot Presbyterian Church on Summer Street. (Source: Charles Cowley, "John Eliot's Work at Wamesit," *Contributions of the Old Residents Historical Association*, v.3, 1904.)

In 1653 about 30 of these settlers petitioned the General Court to grant them title to property on a large tract of land they called Chelmsford. The General Court assented, but it also set aside nearly 15 acres of land for Indian territory in the vicinity of the praying village. Relations, though occasionally strained between colonists and Native Americans, remained relatively peaceful until the 1660s and 1670s, when even Eliot and English settlers sympathetic to the Christianized Indians, were unable to alleviate a growing hostility between colonists and natives that sparked a brutal and bloody conflict. In addition to the violence and death suffered by colonists and natives alike, one result of King Phillip's War in 1675-76, was the ouster of

[5] Donahue, *The Great Meadow*, pp. 41 & 77-78; Bernard Bailyn, *The New England Merchants in the Seventeenth Century*, (Cambridge, MA: 1955), pp. 28 & 55-56.

[6] Richard G. Cogley, *John Eliot's Mission to the Indians before King Phillip's War*, (Cambridge, MA: 1999) pp. 146-148; Charles F. Carroll, "The First White Settlement: The Seventeenth Century," in Arthur L. Eno, Jr., *Cotton was King: A History of Lowell*, Massachusetts, (New Hampshire Publishing Co., 1976). pp. 15-16.



This map of Chelmsford dates from 1794 and shows: (1) Hale's Mills, which includes a saw mill and grist mill, and a clothier mill; (2) the "County Road" which includes a stretch of road that is known today as Plain Street and originally crossed the brook at nearly the same location as today's Plain Street; (3) River Meadow Brook; (4) Pond. (Source: Wilson Waters and Henry Spaulding Perham, *History of Chelmsford, Massachusetts,*

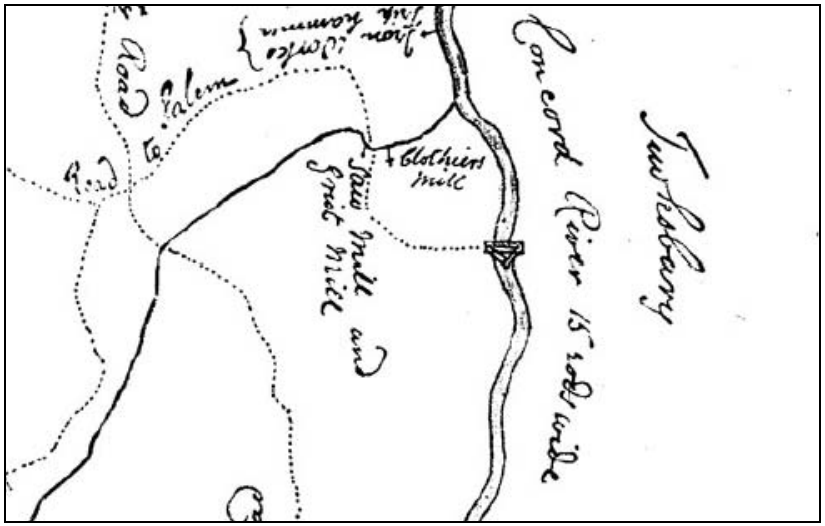
Wamesits, Pennacooks, and other members of the Pennacook Confederacy from the Wamesit grant and the surrounding area. About a dozen Englishman and their families quickly settled on land along the Concord River and began farming, as well as raising livestock. Over the next several generations more landholders and tenant farmers took up residence in Chelmsford Neck and the area that was called East Chelmsford, prior to the establishment of Lowell in 1826.[7]

Part II: Hale's Mills District

This part of River Meadow Brook includes the area around the extant dam on the stream along Gorham Street and extends downstream to the bridge that carries Newhall Street across the brook. This latter location is in the vicinity of a second and earlier dam on the brook that is now in ruins. Today the area along Gorham and Congress streets is home to a number of auto repair garages, light industrial buildings, some commercial buildings, and residential apartments and single-family houses. The historic industries associated with the two dams are no longer extant.

Early Developments of Moses Hale

The son of Ezekiel Hale, Moses Hale was born in Newbury, Massachusetts, in 1765 and moved as young boy with his family to Dracut, where his father acquired a farm and a blacksmith's shop on Beaver Brook. The elder Hale then built a grist mill and a fulling mill for finishing homespun and



This detail from the 1794 map of Chelmsford clearly shows Moses Hale's new clothier (fulling) mill below Gorham Street (part of today's Gorham Street corresponds to the "Road to Salem," as it was called in the 18th century), as well as his recently constructed saw mill and grist mill adjacent to the dam he built above Boston Road.

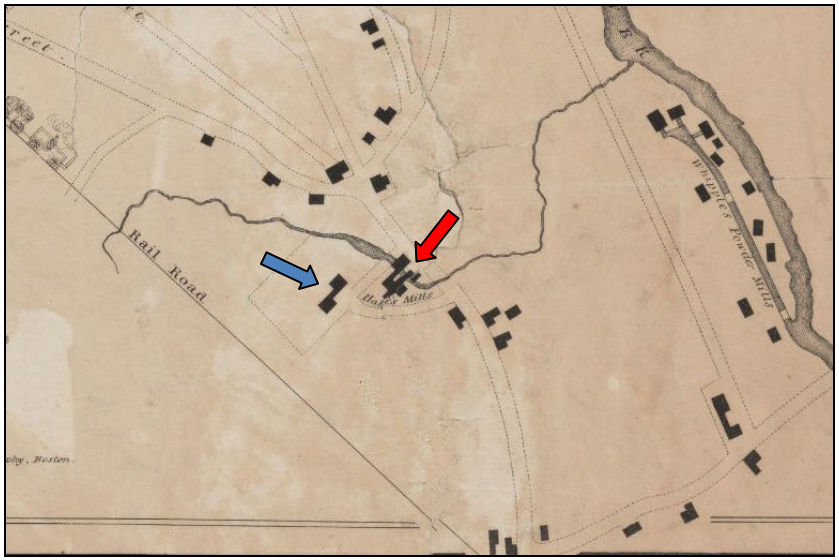
woven woolen cloth.[8] From his father, Moses Hale learned the skills of a clothier and this family enterprise appears to have been quite prosperous. In 1788 the younger Hale married Susannah Davis, the daughter of Moses Davis a prominent Chelmsford farmer with a large property on River Meadow Brook. Shortly before his father's death in 1789, Moses Hale purchased his father's Dracut property. He and his wife remained there for a short time before moving to Chelmsford

[7] Carroll, "First White Settlement," pp. 2-25. The Massachusetts General Court chartered the town of Chelmsford in 1655.

[8] In 1770 James Martin of Dracut sold to Ezekial Hale his property which included a farm, a dwelling, and a blacksmith's shop, located along Beaver Brook. See Northern Middlesex Registry of Deeds, Dracut, v. 3, pp. 357-358.

and settling near the brook and the farm of his father-in-law.[9] The Davis farm included a dam on River Meadow Brook, as well as a saw mill and grist mill. (Davis had purchased this property from Simeon Moors in 1779.) It is likely that the dam and mill on River Meadow Brook were built by either Joseph Moors (Sr.) or Joseph Pierce as early as the 1740s.[10] This water power site that was associated with these early mills was located about 200 feet below the bridge that carried the "Road to Salem," (later called Boston Road and now Gorham Street), over the brook. It was one of only two small falls on River Meadow Brook near its confluence with the Concord River.[11]

Soon after moving to Chelmsford, Moses Hale appears to have taken over the operation of the mills of his father-in-law. Around 1792 he undertook a significant expansion of this



This detail from Benjamin Mather's map of Lowell, 1832, shows Hale's Mills (red arrow) and the Hale mansion (blue arrow). By this time Moses Hale had died and Joshua Swan of the Lowell Machine Shop occupied the Hale estate. (Source: Map Collection at Harvard University.)

enterprise. He constructed a second dam at the falls just above Boston road and built a grist mill and saw mill.[12] At the dam of the lower falls, he established a fulling (or clothier) mill. Hale probably installed the fulling mill machinery in the old grist

[9] According to a deed dated 1791, Moses Hale purchased land in Chelmsford from Herbert Moor (also spelled Moors). This land adjoined the farm of Moses Davis. There is no mention of a dam, mills, or water rights associated with the sale of this property. See Northern Middlesex Registry of Deeds, Lowell, v. 3, pp. 315-316.

[10] In a deed that records Moses Davis' purchase of land from Simeon Moors in 1779, a dam, saw mill, and grist is noted on River Meadow Brook. See Northern Middlesex Registry of Deeds, Chelmsford, v. 7, pp. 11-13.

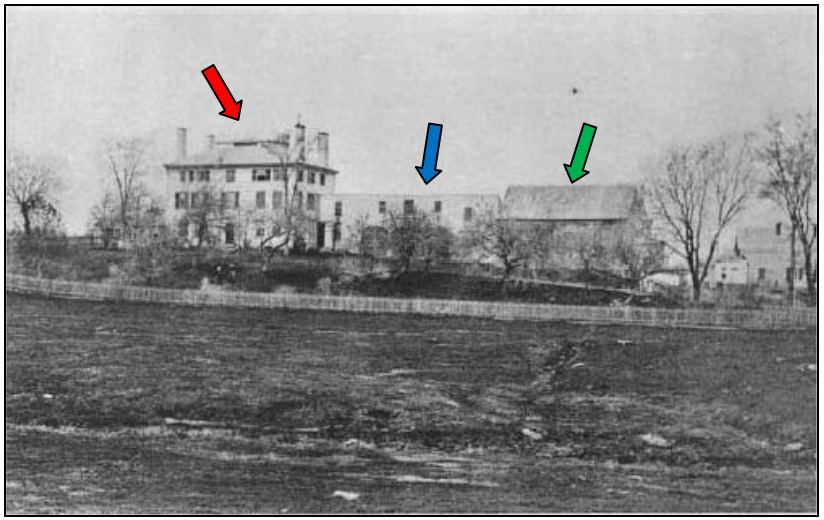
[11] The site of this early dam, grist mill, and saw mill is noted in A. Gilman, "Moses Hale, an Early Manufacturer of Wool, etc., in East Chelmsford," *Contributions of the Old Residents' Historical Association*, v. 1, (Lowell: 1892), pp. 243-245; and Zina Stone, "Before the Power Loom," *Contributions of the Old Residents' Historical Association*, v. 6, (Lowell: 1906), p. 55. Stone also notes (p. 48) that as early as 1691 one John Barret erected a clothier mill on River Meadow Brook near Heart Pond in Chelmsford. It is unclear how long this mill operated and Stone notes that virtually no information exists on "Lieutenant" John Barret.

[12] Hale's construction of this second dam likely prompted legislation that passed in the statehouse in 1793 and required mill and dam owners along the brook to keep their sluiceways open during certain times of the year to allow "for the passage of fish up the said Brook." See "1792 Chap. 0089 An Act For Regulating The Opening Of Sluice Ways, In The Several Mill Dams On River Meadow Brook In The Town Of Chelmsford, And District Of Carlisle" in *Special Acts and Resolves Passed by the General Court of Massachusetts*, (Boston: 1793).

mill building. The capital Hale used to carry out this expansion likely came from the sale of the Hale property in Dracut, which his older brother, Ezekiel, Jr., executed in 1793.[13]

Similar to his fulling mill in Dracut, Hale finished woolen cloth made from handlooms on the surrounding farms. Hale's enterprises prospered and in 1801 he installed a water-powered carding machine, the first of its kind in the area. He gained local fame in 1809 when he produced a fine woolen cloth that was used to make a suit for Congressman Joseph B. Varnum from Dracut, who was elected Speaker of the House.[14] By this time Moses Hale had become one of the wealthiest men in Chelmsford.[15] The area around surrounding his mills on the brook became known as Hale's Mills.

In 1812 Hale's wealth was apparent in the large Federal-style house that he built on a slight rise overlooking the upper dam and mills. For decades thereafter local residents considered Hale's mansion to be the finest house in the area. Hale continued to look for other business opportunities and in 1815 he purchased a farm near Chelmsford Center, along Beaver Brook, where he dug a small power canal and erected a second saw mill. This venture, however, proved unprofitable and he



This photograph of the Moses Hale estate probably dates from the 1870s when the property was owned by the Swan family. The patriarch, Joshua Swan, acquired the Hale property at a public auction in 1830. The impressive 3-1/2 story Federalist style mansion (red arrow), and a 2-story infill dwelling (blue arrow) stood on this site until the early 1890s when the Boston & Maine Railroad purchased the property from the heirs of Joshua Swan and then demolished all of the buildings. The barn (green arrow) was struck by lightning and burned soon after this photograph was taken. The lands of this once grand estate became a railroad siding for the growing freight traffic into Lowell. (Source: *Joshua Augustus Swan: In Memoriam,* 1893.)

sold the property to Jonas Proctor, a wheelwright in Chelmsford.[16]At about the same time, Hale acquired over 20

[13] The sale of the Hale property in Dracut to Joseph Bradley is recorded in a deed dated 1793. See Northern Middlesex Registry of Deeds, Dracut, v. 4, pp. 216-218. Hale acquired the Moses Davis property in 1798 as found in Northern Middlesex Registry of Deeds, Lowell, v. 4, pp. 5-6.

[14] Stone, "Before the Power Loom," pp. 57-58.

[15] Wilkes Allen, *The History of Chelmsford, from Its Origins in 1653 to 1820*, (Haverhill, MA: 1820), p. 83; Gilman, "Moses Hale, an Early Manufacturer," pp. 243-245.

[16] It appears that Moses Hale had two partners in the mill operation on Beaver Brook. The sale of this property in 1816, which included water rights for operating the mill, also involved Simeon and Abijah Spaulding of

acres of land in the area around his mansion. This additional acreage included fruit orchards, hay-mowing fields, and plough lands for growing grain.[17]

Hale's Gunpowder Works

Hale sold a number of other properties he had acquired, a sign that he was experiencing some financial difficulties. Whatever setbacks he suffered, in 1818 Hale embarked on a new enterprise that ultimately reshaped much of the lower section of the brook.[18] This entailed the construction of a gunpowder works, using water power from the lower dam. Called Messrs. Moses Hale & Company, Hale's gunpowder business included two partners. One was William Tileston, a wealthy Boston merchant engaged in overseas trade of such products as indigo. Tileston appears to have been the major investor in the East Chelmsford venture and played an important role in marketing the powder manufactured there.

The other partner, David Hale, possibly a distant relation to Moses, was also a Boston merchant though he had little capital and was 28 years old when he began serving as the company's selling agent in Boston.[19] The man who ran the works was Vermont-born Oliver M. Whipple. Whipple eventually became a partner and expanded the gunpowder works along the Concord River. (Whipple and the changes he carried out to the land at the lower end of the brook are discussed in the next section.)

This detail from the Baldwin map of Chelmsford, 1825, shows the layout of the gunpowder works in relation to River Meadow Brook. The building (red arrow) by the mill pond probably contained the grinding and mixing machinery. (Source: George R. Baldwin, "A Plan of Land and Buildings Belonging to the Merrimack Manufacturing Company … Pawtucket, in the Town of Chelmsford," 1825.)

Chelmsford. See Northern Middlesex Registry of Deeds, Chelmsford, v. 11, pp. 174-176.

[17] Hale's purchase of this additional farm land that was owned by Jonathan Knowles is found in a deed recorded May 24, 1815. See Northern Middlesex Registry of Deeds, Lowell, v. 5, p. 21.

[18] In "Before the Power Loom" (p. 58), Zina Stone notes that Hale encountered financial troubles, but he seems to indicate that this occurred in the 1820s, shortly before Hale's death. The index to pre-1855 deeds at the Northern Middlesex Registry of Deeds reveals that Hale sold more than a dozen properties between 1814 and 1818, possibly to pay off debts and help fund the gunpowder venture.

[19] It is not known how Tileston, born in Dorchester, Massachusetts, in 1779, became acquainted with Moses Hale, although they may have done business together in the textile trade, prior to the founding of the powder works.

This tombstone marks the graves of the Marshall brothers, killed in the horrific explosion of the powder works on River Meadow Brook in 1820. Part of the inscription reads: "They were pleasant in their lives, And in their deaths they were not divided." (Photo and transcription courtesy of Caitlin Hopkins, Chelmsford, Massachusetts.)

From its earliest years, the gunpowder factory of Hale and his partners employed about two dozen men, including Irish immigrants. The works contained a mixing house, a powder house, a stamping and corning mill, and a glazing and packing house. The work was extremely dangerous as witnessed on an early December morning in 1820 when a massive explosion killed four men and destroyed two buildings. Two of the fatalities were young brothers from Chelmsford. The blast was heard some 30 miles away.[20] Quickly rebuilt, the powder works caught fire and exploded just six months later, killing three more workers. Incredibly, six months later a fire in the drying house oven sparked another explosion killing one Thomas Sullivan, blowing open doors of barns and dwellings in the vicinity of the works, and shattering numerous windows.[21]

Moses Hale decided to withdraw from the gunpowder business in the fall of 1821. His partners bought him out and continued to operate the River Meadow Brook works. Hale appears to have focused his attention on his grist mill and was joined by his sons Bernice and Perley. In 1823 he reconstructed the upper dam, which raised its height and resulted in occasional flooding of even larger amounts of land upstream.[22] A year later, Hale

[20] This horrific explosion and loss of life was reported in numerous newspapers including the *Boston Daily Advertiser*, December 6, 1820, and the *Gettysburg [Pennsylvania] Compiler*, December 20, 1820.

[21] This second explosion killed two men from Fitchburg, Massachusetts and one man from Hillsboro, New Hampshire. See *[Boston] Columbian Centinel*, June 9, 1821. Also see Wilson Waters, *History of Chelmsford, Massachusetts*, (Lowell, MA: 1917), pp. 817-818.

[22] Some 22 years after Moses Hale's death, carpet manufacturer Joshua Mather who acquired the mill property, dam, and water rights for the

reacquired the gunpowder business at the lower dam. He ran this enterprise on his own, while using Kendrick, Gray & Co., as his selling house in Boston.[23] Casks of powder produced at the works were shipped to Boston by wagon or by barge on the Middlesex Canal.

After establishing Moses Hale & Co., Hale saw his fortunes decline and shortly before his death in 1828, at the age of 63, he sold a number of his mortgaged properties. Although one of his sons, Perley Hale, purchased the grist mill and water power privilege at Hale's Mills, the fine mansion and farm property were sold at a public auction to pay off the debts of the deceased Moses Hale.[24]

The Swan Estate and the "Village" at Hale's Mills

In 1830, Joshua Swan offered the highest bid, amounting to $3,225, for the Hale estate which comprised over 21 acres of land along River Meadow Brook and included the large mansion and barn at Hale's Mills. Born into a prominent family in Methuen, Massachusetts, in 1788, Swan received his education in district schools before apprenticing as a carpenter. In his mid twenties he obtained a job in the machine shop of the Boston Manufacturing Company in Waltham,

GUNPOWDER.

MOSES HALE has recommenced the manufacture of Gunpowder at his Mills in Chelmsford, where the business for two years past, has been carried on by Tileston, Whipple, & Hale. He has formed a new connexion, and the business in future will be conducted in the name of

MOSES HALE & CO.

Who have made additions and repairs to the buildings, improved the machinery, and have now every convenience for making gunpowder of superior quality. The reputation of the powder formerly made by M. Hale & Co. is well established, and purchasers may at all times be supplied with the article of equal quality, on application to KENDRICK GRAY, & CO. Boston, who have been appointed agents for selling the Gunpowder made at this establishment.

KENDRICK, GRAY, & CO. have constantly for sale, Gunpowder of superior quality, made by M. Hale & Co. Samples may be seen at their Store No. 23, Merchants'-row.

Purchasers of large quantities, for shipping, may at all times be supplied on the most favorable terms.

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This advertisement appeared in a Boston newspaper announcing Moses Hale's return to the gunpowder business. (Source: *Columbian Centinel*, January 7, 1824.)

brook's flow was sued by a group of upstream landholders, including Ignatius Tyler, for the flooding of his lands. See "Ignatius Tyler and others vs. Joshua Mather," in Horace Gray, Jr., *Reports of the Cases Argued and Determined in the Supreme Judicial Court of Massachusetts*, v. 9, (Boston: 1883), pp. 177-185.

[23] *[Boston] Columbian Centinel*, January 7, 1824.

[24] According to the deed of the sale of the Hale estate, Moses Hale was over $7,000 in debt at the time of his death. See Northern Middlesex Registry of Deeds, Lowell, v. 9, p. 252. One of the first properties sold by the executor of the Hale estate, Joel Adams of Chelmsford, was the lower dam and gunpowder factory on River Meadow Brook. Oliver Whipple purchased the dam and factory building in 1829, paying $4,500. See Northern Middlesex Registry of Deeds, Lowell, v. 8, pp. 578-581.

Massachusetts, soon after it commenced operations in 1814.[25] In 1824 he moved to the growing textile village of East Chelmsford, joining the talented mechanic Paul Moody in the Lowell Machine Shop. Swan became closely associated with Kirk Boott who not only served as agent of the Merrimack Mills and the machine shop, but was the leading figure in the development of the waterpower canals, factories, and boardinghouses. Both Boott and Swan played important political roles in Lowell following its establishment as a town in 1826. Swan was elected as selectman in eight of the ten years of Lowell's township status. Like Boott he was a staunch Federalist before becoming a dedicated Whig when the party was founded in the early 1830s.

As a master machinist in the machine shop, Swan served as an "inside" contractor and hired as well as directed machinists, journeymen, and apprentices in the manufacture of various iron goods. This ranged from textile machinery to metal parts of large water wheels. Swan likely had amassed some wealth prior to his move to Lowell, but his years at the machine shop were also quite profitable. He had married Olive Jones of Lancaster, Massachusetts, in 1817 while in Waltham, and his status as one of Lowell's elites was further enhanced when he and his wife moved into the former Hale mansion in 1830. At this time their family included two daughters, Maria, age 9, and Sarah J., age 2, and two sons, Joshua Augustus, age 7, and Albert G., age 4. They would have one more son, Charles W., who was born in the mansion in 1838.[26]

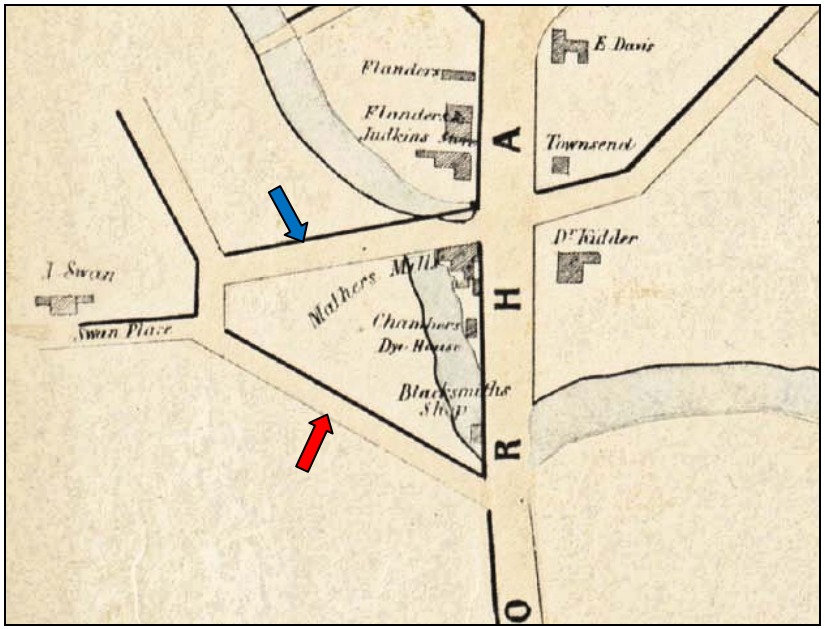
This detail of a ca. 1870s photo of the Swan (formerly Hale) mansion Hale's Mills shows the main (south-facing) façade. The trees appear to have been planted during Joshua Swan's early years of ownership of the estate. Note the picket fence that divided the landscaped front yard from the farm field below. To the right is an attached infill dwelling and stable. This rural scene belies the industrial works and railroad structures that were encroaching on the land surrounding Hale's Mills at this time. (Source: *Joshua Augustus Swan: In Memoriam,* 1893.)

[25] For biographical information on Swan see "Hon. Joshua Swan," in *Contributions of the Lowell Historical Society*, v. 1, (Lowell, MA: 1913), pp. 40-41; Joshua Augustus Swan, *In Memoriam*, (Cambridge, MA: 1893), pp. 4-5; and obituaries in *the Lowell Daily Citizen & News*, April 22, 1867, and the *Lowell Daily Courier*, April 22, 1867.

[26] Swan, *In Memoriam*, p. 4.

For the first two decades that Swan resided on the estate at Hale's Mills he continued at the Lowell Machine Shop. In addition, he served as a director of the Railroad Bank in Lowell, chartered by a number of officials and investors in the city's cotton manufacturing corporations. Swan also speculated in Lowell real estate. Although some of his real estate purchases were parcels of land that extended his property westward along River Meadow Brook and southward below the gently sloping hillside on top of which his stately mansion was sited, Swan also acquired property in the downtown, in Belvidere, and in Dracut. He oversaw the farming on his estate and hired both native-born and Irish immigrants as farm laborers. Some of these men lived on the Swan estate. In the 1830s Swan also rented a wing of his house to agents of the nearby Lowell Bleachery.[27]

Although less than a mile from Lowell's burgeoning downtown, Hale's Mills retained its rural village character well into the 1860s. Davis Corner, at the intersection of Gorham and Central streets formed the center of this village. A district school called the red schoolhouse and located near Hale's Mills, also served as a center for religious worship for local residents. Some of Lowell's earliest Baptist services were held



This detail from an 1850 atlas of Lowell shows the Joshua Swan mansion at "Swan Place," off Gorham Street. The unnamed road (red arrow) leading to the Swan mansion became Congress Street by 1851. The other unnamed road (blue arrow) crossing River Meadow Brook at the location of the dam was later named Congress Avenue. Note that the former mill buildings associated with Moses Hale are occupied by Joshua Mather (Mather's Mill) and Cyrus Chambers (Chambers' Dye House). The blacksmith shop was operated by William W. Austin, who, in 1850, was 26 years old and lived with his wife Emily, age 19, nearby on Chapel Street. Across from the mills on Gorham Street is the residence of Dr. Moses Kidder, who was one of Lowell's early physicians. (Source: Center for Lowell History.)

[27] For a list of the various properties acquired by Swan between 1830 and 1855 see Northern Middlesex Registry of Deeds, "Index of Pre-1976 Grantees," pp. 404-408. Information on Swan, his family, and residents of the Swan estate is found in Lowell city directories in the 1830s, 1840s, and 1850s, and in the federal census for Lowell, 1840, 1850, and 1860. That Swan was among the wealthiest men in Ward 4 during the 1850s and 1860s is evident in the value of his personal estate, amounting to nearly $12,000, as indicated in the federal census for Lowell in 1850 and 1860.

here.[28] For a few years in the 1830s the village boasted of the Wamesett Inn, run by the Marston family, followed by English immigrant Charles P. Talbot. Located on the corner of Thorndike and Gorham streets, this inn was also a West Indian goods store. For a number of years, beginning in about 1850, it was run as a grocery and dry goods store by Rufus N. Hayden, who had been a carpenter in Lowell some 15 years earlier. In addition to this store and the school, there were several homes in the vicinity of Hale's Mills owned by long-term residents. Among these were physicians Moses Kidder and William H. Carter, yeoman Elisha Davis, cotton batting manufacturer Jonathan Knowles, farmer Phanuel Flanders, and Moses Hale's son Bernice, who ceased milling grain with his brother and owned an apothecary by the mid 1840s.[29]

In addition to these property owners and their families living near Hale's Mills, there were many property-less men and women who resided at this locale. This included both native born persons and immigrants. For example, Patrick Rafferty, who was born in Ireland around 1824 and worked as a dyer at the Lowell Bleachery when he was in his mid twenties, lived briefly next to Phanuel Flanders. In 1850 this household included Rafferty's Irish-born wife, Margaret, age 24, their infant son John, who was born in Lowell in 1849, Patrick's brother, John, age 30, and four other Irish immigrant men, who ranged in age from 25 to 37. All of these men worked at the bleachery, which was about a quarter-mile from their residence at Davis Corner. Unlike the other men in his household, however, Patrick Rafferty saved enough money and purchased a house in 1852 on nearby Cedar Street.[30] The majority of mill workers and farm laborers living near Hale's Mills resided there only a short time before moving either to another part of the city or leaving Lowell altogether. A number of these laboring families, primarily Irish, lived in a wood-frame tenement that Swan's neighbor Jonathan Knowles constructed in the 1840s.[31] While the bleachery was the largest single employer in the area, smaller mills associated with the Whipple Canal (later called the Wamesit Canal) also provided jobs for both skilled and unskilled workers.

Up until his death in 1867, Joshua Swan was the wealthiest man in the Hale's Mills area. He was prominent in the

[28] "Lowell Church," *Freewill Baptist Quarterly*," v. 14, (July, 1866), p. 334.

[29] The Wamesett Inn appears in Lowell's city directory in 1838 and 1839. Dudley J. Marston, a Tewksbury farmer who died in 1838, appears to have established this inn, having opened a West Indian dry goods store at Hale's Mills around 1834. Marston purchased the property on Boston Road along River Meadow Brook from Simeon Spaulding. See Northern Middlesex Registry of Deeds, Lowell, v. 15, (1833), pp. 576-577. After Marston's death Talbot operated it for only one year See city directories for 1835, 1838, and 1839. Also at Hale's Mills was Cyrus Chambers who operated a dye works on the east side of Gorham Street near the dam.

[30] Patrick Rafferty purchased the house on Cedar Street from John McSorley for $525 a considerable amount of money given that his wages at the bleachery likely amounted to approximately $5 per week. For Rafferty's purchase of the McSorely property see Northern Middlesex Registry of Deeds, Lowell, v. 81, (1852), pp. 131-132.

[31] This tenement contained 42 rooms and was located on Congress Street, next to Hale's Mills. A list of the Irish families recorded as living there may be found by examining the federal census for Lowell and looking the inhabitants residing next to Joshua Swan. The tenement was put up for sale in 1865 and its description is found in the advertisement for the auction of the Knowles' estate. See "Auction Sales," *Lowell Daily Citizen & News*, November 10, 1865.

Pentucket Lodge of the Masons and remained active in local Whig politics until the party's demise in the mid 1850s. Additionally, in a rare challenge to a fellow Whig candidate, he ran for mayor in 1847. Swan was narrowly defeated in this election and much of his impetus for running stemmed from disenchantment of residents in his ward with the city government. The most common complaint was the lack of municipal services, including road and drainage improvements, in Ward 4.[32] This inaction of the mayor and city council was hardly surprising, given the small population here, especially compared to Lowell's downtown, where street and sewage work was sorely needed. Yet it angered many of the residents. Throughout much of Swan's life, "villagers" in the immediate vicinity of Hale's Mills saw little change to their surroundings.

At about the time Swan ran for mayor he retired from the machine shop and assumed the role of gentleman farmer. Swan also became increasingly involved in real estate and rented various properties, primarily to working-class men women, and families. It was his farm along River Meadow Brook, however, that he prized above all of his other business pursuits. His estate included an orchard, large hayfields, and livestock, which were primarily cattle. The Swan farm was the scene of contests in hay mowing. One highly publicized event in 1859 featured the Ketchum Mowing Machine, manufactured in Middletown, Connecticut, competing against the famous Manning Mowing Machine, originally patented by William Manning of New Jersey in the 1830s, but actually developed by Manning's wife, Ann. Nearly 200 people from Lowell and the surrounding towns watched this contest.[33] Occasionally at the annual North Middlesex Agricultural Society's fair held at the nearby fairgrounds, events such as field-plowing contests with teams of oxen and horses were held at the Swan farm.[34]

The Demise of the Village

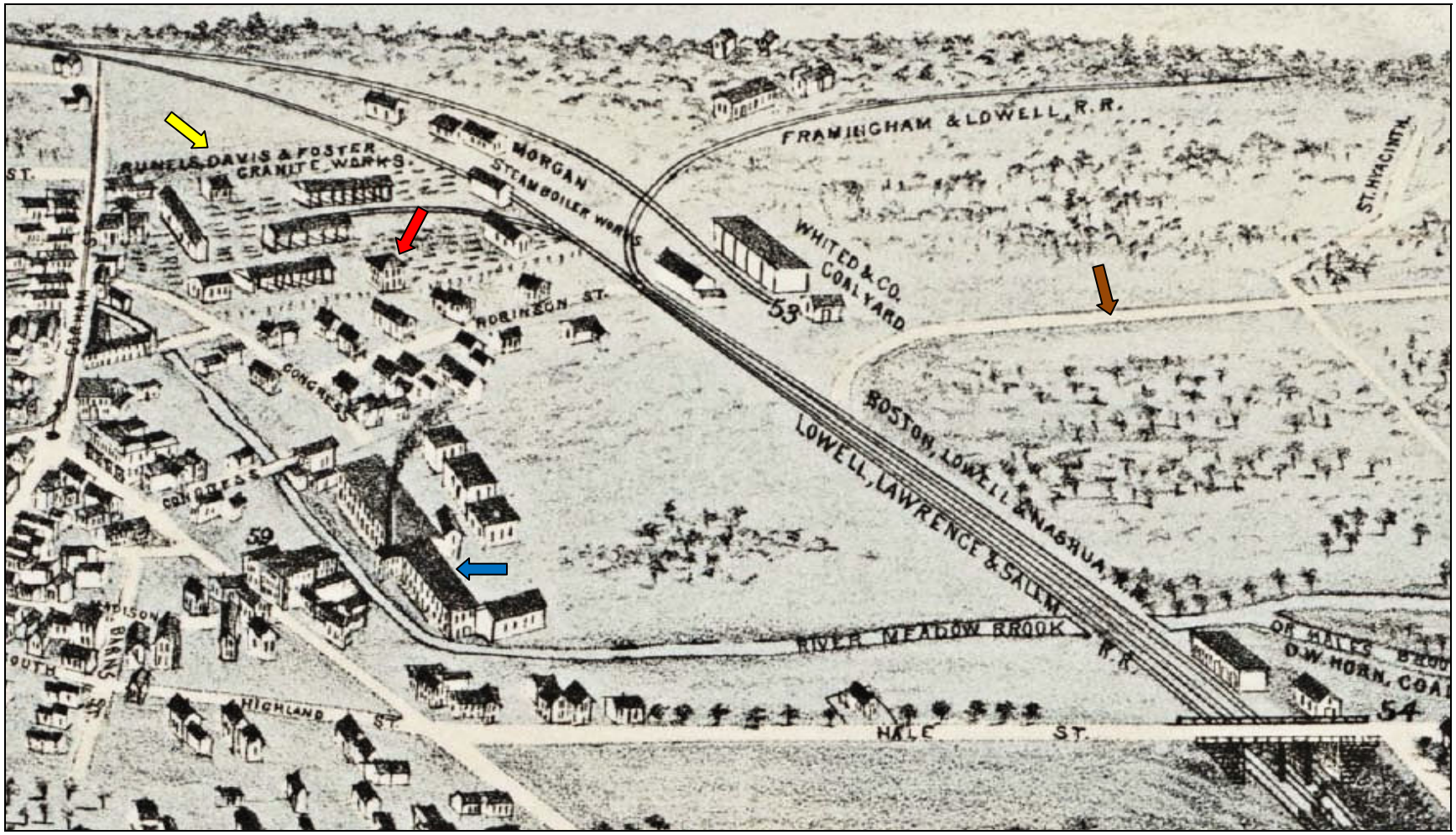
Urban growth began to encroach on the area surrounding Hale's Mills in the 1850s, but accelerated in the two decades after the Civil War. After Joshua Swan's death his heirs sought to benefit from this growth by subdividing some of their estate, laying out a new street, and building small cottages for rental or for sale. The heirs also leased a large part of the estate to George Runels who moved his granite company from Thorndike Street to formerly open land just below the mansion. New dwellings off Gorham Street and on either side of River Meadow Brook ranged from single-family and two-family houses to tenement blocks. The population was becoming increasingly composed of immigrant families, mostly from Ireland.

Joshua Swan's widow, Olive, and her two unmarried daughters continued to live in the mansion, but they rented one wing of

[32] "Municipal Election," *Lowell Daily Courier*, March 3, 1846. A second election, due to a revision of the city charter, was held the same year in December and Swan again ran against fellow Whig candidate Jefferson Bancroft. Bancroft won easily though one editor of a Lowell newspaper noted the discontent in Ward 4 over poor city services. See "The Municipal Election, *Lowell Daily Courier*, December 15, 1846.

[33] "City Matters," *Lowell Journal and Courier*, June 21, 1859; "The Trial of Mowing Machines," *Lowell Daily Citizen & News*, June 23, 1859.

[34] "The Agricultural Fair at Lowell," *Boston Daily Advertiser*, September 13, 1861.



A detail from the 1876 bird's-eye view of Lowell shows the Swan mansion (red arrow) in relation to the other structures and railroad lines that encroached upon the estate by the mid 1870s. The Swan heirs leased part of their property to George Runels who moved his granite works (yellow arrow) to this location. The large factory (blue arrow) off Congress Street along the brook is William H. Carter's woolen mill, formerly the Lowell Wadding & Paper Company owned by George Ripley. At this time the north end of Tanner Street (brown arrow) was largely undeveloped, although the Whithed & Company established a coal yard at the foot of Howard and Tanner streets in 1875. (Source: Levanthal Map Center, Boston Public Library.)

This detail from an atlas of Lowell, 1879, shows the encroaching development around the Swan mansion (red arrow). This included rail lines and buildings associated George Runels' stone yard, all of which were constructed in the 1870s. (Source: Center for Lowell History.)

the house to a number of working women, including Emeline Moxley, her elderly mother, and her three daughters, all from Vermont.[35] Of the other Swan family members, the oldest son, Joshua Augustus, graduated from Harvard Divinity School in 1851 and became a Unitarian minister. He never again lived in Lowell settling in Maine and later Cambridge, Massachusetts. The youngest Swan son, Charles W., who became a physician and taught at the Harvard Medical School, lived many years in Brookline, Massachusetts.[36]

Only the middle son, Albert G., remained in Lowell his entire life. For a few years he followed his father, entering the Lowell Machine Shop, before he became a builder and real estate speculator in the mid 1850s. It was Albert who developed a number of the Swan estate's properties, constructing houses and small cottages in the vicinity of Congress Street and in Ayer's City. In 1867 he acquired a large parcel of farm land along River Meadow Brook in the southernmost part of Lowell. There, he established his own farm where he and his wife, Martha, raised their six children. In 1887, after nearly 20

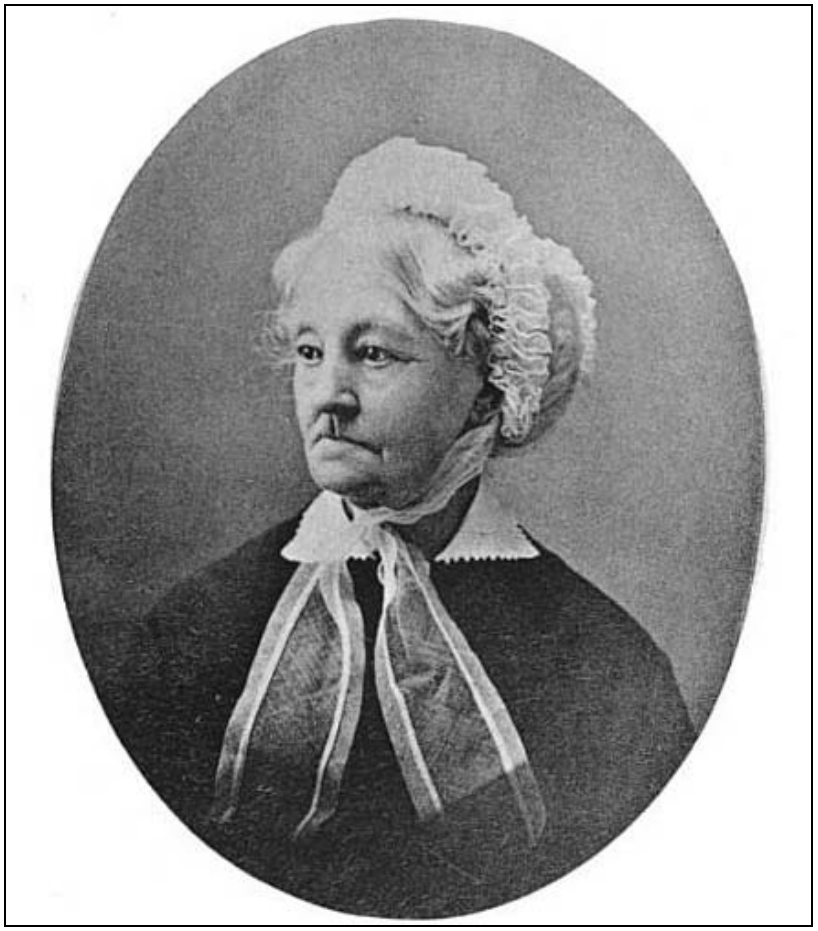
[35] See the federal census for Lowell in 1870. It indicates that the three unmarried daughters in the Moxley family lived in a wing of the Swan mansion and ranged in age from 22 to 31. Two of these women worked in the garment and textile industries while the other was employed as a store clerk.

[36] The Reverend Joshua Augustus Swan died in Cambridge in 1871 at the relatively young age of 48 of stomach cancer. Charles W. Swan remained in Brookline until 1906 when he and his wife moved back to Lowell and lived with his sister, Sarah J., on Livingston Avenue. Sarah Swan died in 1913. Charles continued to reside in the Livingston Avenue house until 1915. He moved to Branford, Connecticut, where, as a widower, he lived with his son-in-law who was married to his youngest daughter.

years as a farmer, Albert Swan sold his livestock, fields, and house, and .moved to a dwelling he had built years earlier on the vastly changed Congress Street. By this time his mother, Olive Swan, and his two unmarried sisters had moved out of the Swan mansion and lived in a house he had built on Livingston Avenue near Middlesex Village. But Albert Swan remained on Congress Street until his death in 1914.[37]

By the mid 1870s the "village" at Hale's Mills was barely recognizable from its appearance just a decade earlier. The Swan mansion was fully encircled by railroad lines, warehouses, and a coal yard to the west, the Runels stone yard to the south, tenements and cottages to the east, and the more substantial homes of Thomas Pratt and William Batchelder to the north. The land along the brook just above the dam was lined with factory buildings, the largest of which was the Lowell Wadding and Paper Company off Congress Street, and opposite was the Thorndike Manufacturing Company, producers of narrow woven goods including suspenders. Just below the dam was the cotton batting mill of Josiah Butler, who also owned the dam and water rights to the flow in River Meadow Brook.

Although the landscape along the stream had been so dramatically altered, one important vestige of the Hale's Mill village in the late 19th century was the Swan mansion. This landmark, however, shared a fate common to other early



The matriarch of the Swan family, Olive Swan, died in Lowell in 1892 at the age of 97. Her son Albert negotiated the sale of the Swan mansion to the Boston & Maine Railroad the year before her death. (Source: *Joshua Augustus Swan: In Memoriam,* 1893.)

[37] See Lowell city directories 1851, 1855, 1870, 1880 & 1907; and "Cows To Be Sold," *Lowell Daily Courier*, March 29, 1887; "84th Birthday Observed By Albert G. Swan at His Home," *Lowell Sun*, June 1, 1910.

buildings in this area. In 1891 the Swan family sold the "commodious old mansion of the estate" to the Boston & Maine Railroad, which demolished it and the remaining Swan farm buildings.[38] The railroad eventually constructed rail sidings and a warehouse here, leaving no trace of what was formerly one of the grandest Federal-style houses in the area.

The Dam Controversy

River Meadow Brook had long been used as an open sewer to dispose of household and industrial wastes. But by the l870s, with the growth in population and manufacturing in the vicinity of Hale's Mills, the stream was increasingly proclaimed by residents to be a "public nuisance." The city hired a consulting civil engineer, David W. Cunningham, to design a sewer system for all of Lowell. A substantial part of the Cunningham plan was an intercepting sewer along the brook to drain a large section of south Lowell and convey the wastes into the Concord River.[39] For several years the city council debated the merits and costs of this large-scale project. In the meantime, residents of Ward 4 petitioned the mayor and alderman to take action.

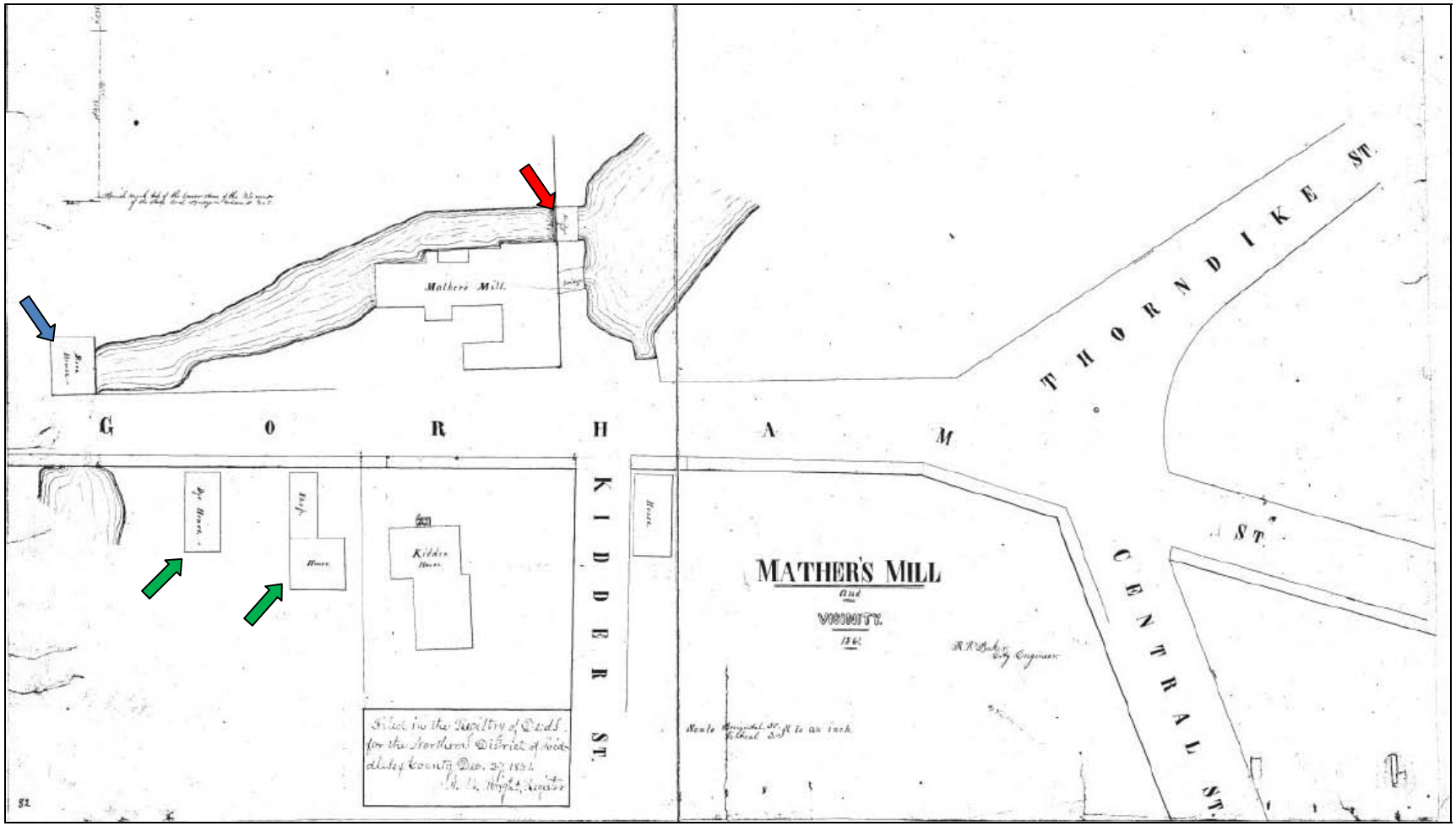
One such petition demanded that the city purchase Josiah Butler's mill, dam, and water rights, then remove the dam and straighten as well as deepen sections of the stream. Such an undertaking, these petitioners claimed, would "serve not only to drain the hundreds of acres of meadow land covered with stagnant water, which makes the vicinity so unhealthy and undesirable," but "the channel of said brook … [could be] utilized as the receptacle for the sewerage of all the highlands on each side of the valley." These Ward 4 residents also stressed the economic benefits to property holders who could then develop "more than 500 acres of fine building land."[40]

Although the city council considered the proposal, it chose instead to construct the intercepting sewer, work on which began in 1882 with completion two years later. Yet complaints continued over the conditions of the brook, variously dubbed a "pest hole" or a "mud hole of peat and decomposing matter." Despite the advent of the intercepting sewer, among the problems that persisted were the many drains and small sewer lines, such as the one on Congress Street, which emptied into the stream. Outrage, protests, and petitions continued into the 1890s led by prominent residents, most notably Jerome F. Manning, Walter H. Bagshaw, and William H. Penn. Manning was the most vociferous and ardent advocate for the dam removal and the channelization of River Meadow Brook. He argued for straightening the stream, beginning at the city's poor farm and extending to Congress Street where the brook curved

[38] "Large Land Sale," *Lowell Daily Courier*, May 14, 1891. The Swan heirs sold their estate to the Boston & Maine Railroad for $46,118.94. See Northern Middlesex Registry of Deeds, v, 224, pp. 28-31.

[39] David W. Cunningham, "Report to the Committee on Sewers and Drains of the City of Lowell," *City Documents of the City of Lowell, for the Year 1873-74*, (Lowell: 1874).

[40] "Improved Drainage Asked in Ward Four," *Lowell Daily Courier*, March 13, 1880. Josiah Butler opposed the acquisition of his dam. Only four years earlier when his batting mill (previously known as Mather's Mill for its owner Joshua Mather) was destroyed by fire Butler rebuilt the factory, which used both water and steam power. See "Batting Mill Destroyed," *New York Herald*, August 24, 1876; "The City," *Lowell Daily Courier*, August 29, 1876.



City engineer Richard W. Baker prepared this plan of Joshua Mather's mill in 1861 as part of a legal contest between the city and Mather over flowage rights in the brook. The dam (red arrow) was immediately adjacent to Mather's Mill. Mather also owned the store house, formerly a blacksmith shop (blue arrow), just downstream. Cyrus Chambers' dye house, dwelling, and workshop (green arrows), were located on the east side of Gorham Street. The dye house also drew water from the brook and dumped its affluent into the stream. Chambers operated this dye house from the mid 1820s until 1870. Josiah Butler acquired Mather's Mill, the dam, and water rights in 1873. (Source: Northern Middlesex Registry of Deeds, Plan Book #1, p. 5.)

toward the Concord River, and demolishing the dam so the stream could flow unimpeded as it passed by the Lowell Bleachery and down to the river. [41]

Josiah Butler with his mill privilege was one of the main obstacles to this channelization plan. A long-time resident of Lowell, Butler was born in Pelham, New Hampshire, in 1836 and settled in Lowell when he was 18 years old. For a number of years he clerked in the grocery of Nichols & Company on Central Street. In 1862 he married Mary E. Sherman, who was born in Lowell and whose father was an overseer at the Lowell Carpet Mills. Butler did not serve in the military during the Civil War and continued to work in the grocery business. His status in Lowell's business community rose a few years after the war when he was hired as a clerk in George Ripley's Lowell Wadding & Paper Company.

While working for Ripley at the wadding and paper mill off Congress Street, Butler became familiar with Mather's Mill, formerly Hale's Mill, and the dam next to Gorham Street. In 1873 the heirs of Joshua Mather offered for sale about an acre of land, including the mill, and the dam along Gorham Street, as well as the lower dam and mill property about 100 yards downstream.[42] Included in the sale of the upper dam and mill by Gorham Street was the "right of flowage" in River Meadow Brook and the drawing of water from Heart's Pond, headwaters of the brook.[43] Butler had sufficient capital to purchase the

[41] Instead of contracting out the work, the city built the intercepting sewer at a cost around $300,000. Apart from the city waterworks project in the early 1870s, this was the most extensive public works project undertaken by the municipal government up to this time. For the many difficulties encountered during its construction, including in the area of Hale's Mills, see "The Intercepting Sewer," *Lowell Morning Times*, November 15, 1882, and especially "The Intercepting Sewer," *Lowell Morning Times*, November 14, 1883.

[42] Born near Preston in Lancashire, England, Joshua Mather immigrated to the United States in 1827 and immediately settled in Lowell where he found employment as a block printer at the print works of the Merrimack Mills. Mather remained at the print works until 1843when he began manufacturing carpets at Hale's Mills. It appears that the mill in which Mather initially produced carpets was at the lower dam, below Gorham Street. In the early 1840s Carpet designer Peter Lawson had converted this mill, which was originally part of Moses Hale's gunpowder works, into a carpet factory. Lawson leased this property from Oliver Whipple who acquired Hale's flowage rights in River Meadow Brook and various mill properties formerly held by Perley and Bernice Hale, sons of Moses Hale, after the two men became bankrupt in 1841. When Lawson relocated to Dracut, where he built a carpet mill, Mather leased the factory building. Mather's enterprise proved to be successful and he expanded his factory in 1850 when he purchased the upper dam, mill, and water rights from Oliver Whipple. For more than a decade thereafter the former grist mill and saw mill along Gorham Street that Mather converted into a carpet factory became known as Mather's Mills. Joshua Mather operated his mills until his death from consumption at age 60 in 1865. See his obituaries in the *Lowell Daily Courier*, June 23, 1865; and the *Lowell Daily Citizen & News*, June 23, 1865.

[43] Having left no children Joshua Mather deeded his mill property to three of his nephews, along with the son of one nephew, provided that they continue running the carpet factories on River Meadow Brook. Although the Mather nephews found themselves in a legal contest with Horatio G. F. Corliss, the executor of the Mather estate, they formed John Mather & Company in 1866 and continued to manufacture carpets. Albert G. Browne, Jr., *Massachusetts Reports, v. 103: Cases Argued and Determined in the Supreme Judicial Court of Massachusetts, October 1869-January 1870*, (Boston, 1871), pp. 568-571. Three years after this legal battle ended the Mather heirs decided to sell the mill properties and water rights. See the notice for this sale in the *Lowell Daily Citizen & News*, April 28, 1873.

property and water rights for $9,200.[44] In 1873, he formed the Lowell Waste Company that produced cotton batting for use in various manufactured goods such as mattresses or furniture.

Joining Butler in his cotton batting business was Otis D. Spofford. About a dozen years younger than Butler and also born in Pelham, Spofford too had worked as a clerk for the Lowell Wadding and Paper Company.[45] At the Lowell Waste company he and Butler built up a profitable enterprise operating the small steam and water-powered mill that employed about 20 men who processed around 2,000 pounds of waste cotton each day.[46] Work entailed unloading and sorting waste cotton and other fibers obtained from textile mills, operating picking and carding machines, and packing the cotton bats. The operation itself produced little in the way of effluents, but Butler's dam was increasingly viewed as a barrier that prevented the brook from flushing noxious wastes downstream.

The proposal to demolish the dam was initially vigorously contested by Butler. Through his company's attorney, William D. Anderson, he threatened the city with a lawsuit if the Lowell Waste Company's property was endangered. Butler, a Democrat who had served on the city council and was active in local Democratic politics, was also indirectly responding to a political nemesis, Jerome Manning, a long-time Republican and leading proponent of the dam's removal.[47] In 1895, however, Butler offered to sell to the city his company's water rights. Butler's declining health, the political pressure to demolish the dam, and the opportunity to profit from this transaction likely factored into his decision. After consulting with the city solicitor, however, the water board declined stating that the "water rights offered were of too uncertain a

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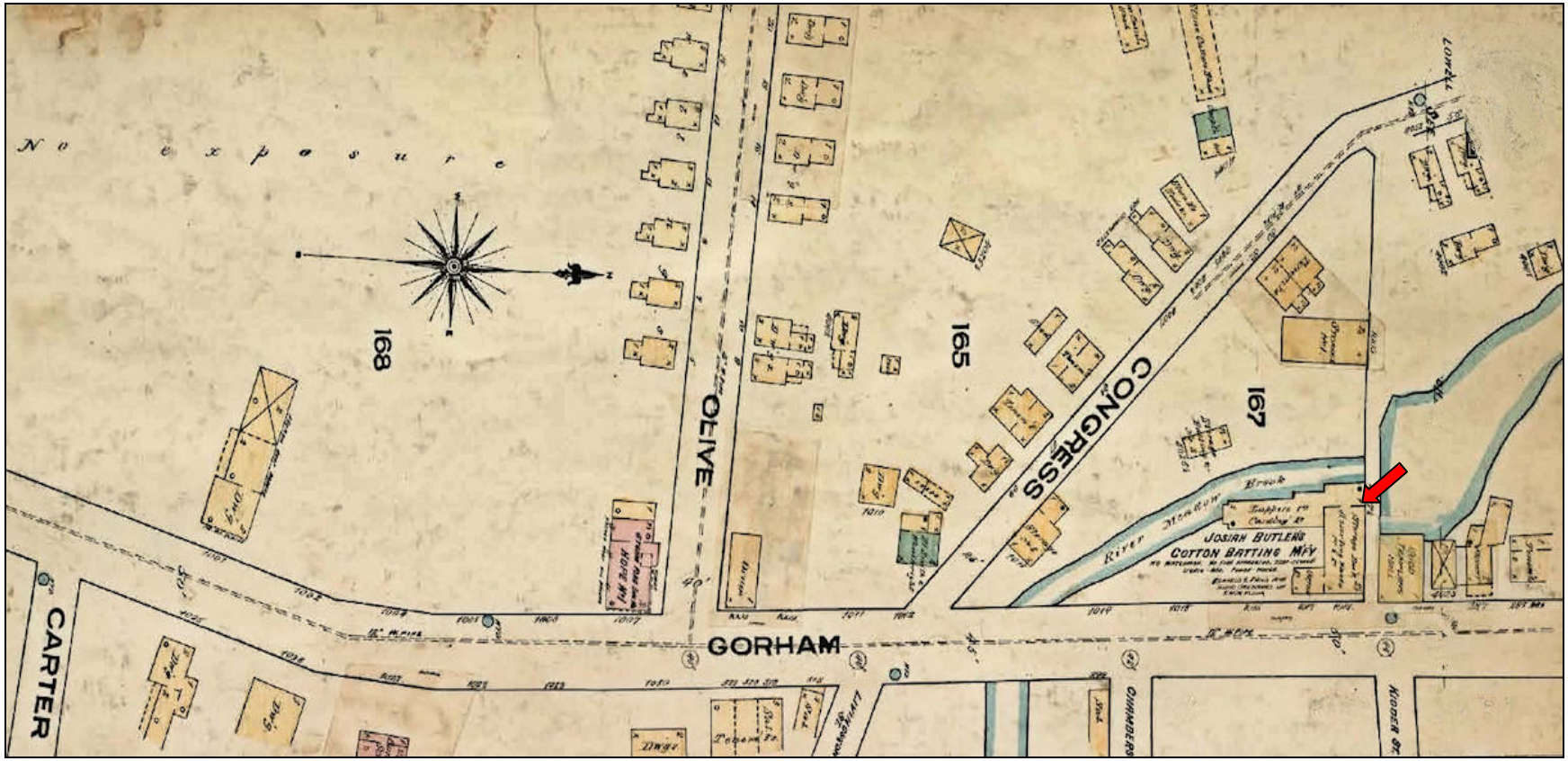
While Butler acquired the upper dam, mill, and, importantly, the water rights, the Lowell Bleachery purchased the lower dam and factory on Chambers Street (see the section on the Lowell Bleachery for more information on this property).

[44] For the deeds to the Mather properties held by Butler see Northern Middlesex Registry of Deeds, v. 94, pp. 106-115.

[45] Spofford initially served as Butler's bookkeeper and clerk of the works, but became the company's treasurer in 1893 when he and his partner incorporated their business in Massachusetts. It was at this time that Butler became the firm's president and sold the mill property to the Lowell Waste Company. The company was capitalized at $40,000. See "A New Company," *Lowell Sun*, August 16, 1893, and "State House Notes," *Boston Globe*, July 5, 1893. Prior to 1893, this property and the water rights had been in Butler's name. See Northern Middlesex Registry of Deeds, v. 245, pp. 275-276.

[46] A short summary of the Lowell Waste Company appears in George A. Marden and Edwin W. Thompson, (eds), *The Bivouac*, (Lowell: 1886), p. 55. Soon after he purchased the mill from the Mather heirs, Butler added a 10-horsepower steam engine and boiler to supplement the water power. See "Board of Alderman," *Lowell Daily Courier*, September 25, 1874. Butler's only other significant improvement to the mill occurred two years later when a fire partially destroyed the main wood-frame building and ell. But instead of constructing a new building he merely repaired the old one. See "The City," Lowell Daily Courier, August 29, 1876.

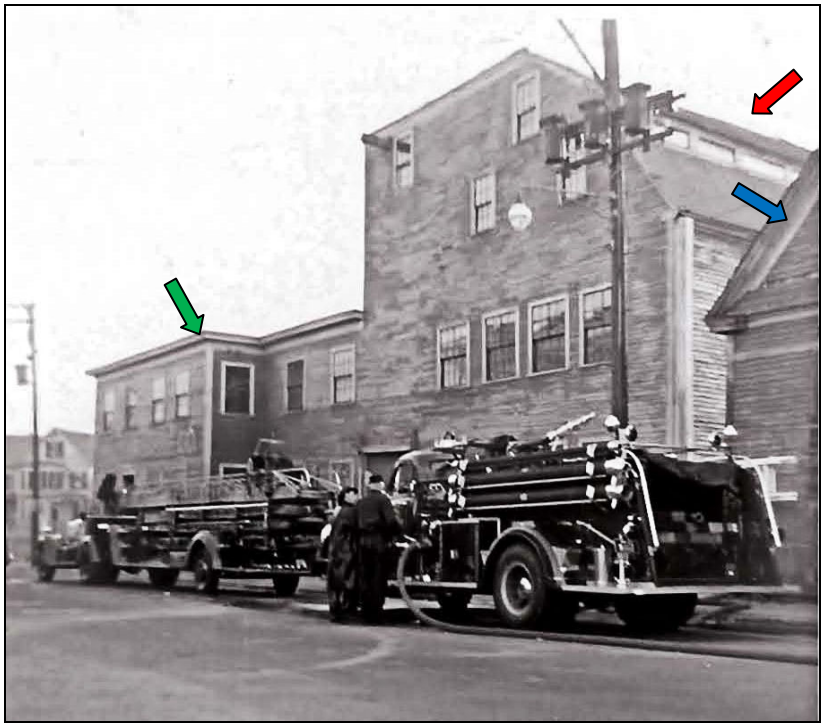
[47] The threatened suit is noted in "Ward Three's Pest Hole," *Lowell Sun*, October 13, 1894. As a Democrat, Butler won election to the city council in 1874 and ran unsuccessfully for state representative from Lowell in 1886. In addition to campaigning for improving River Meadow Brook, Manning and his Ward 3 Republican Club intended to "redeem" this part of the city from "Democratic misrule." See "Hale's Brook," *Lowell Evening Star*, June 10, 1890.



This detail from an 1882 atlas of Lowell shows the cotton batting mill (red arrow) of Josiah Butler's Lowell Waste Company, and part of the mill pond behind the dam. Josiah Butler purchased the mill, dam, and water rights from the Mather heirs in 1873 and initiated cotton batting production in the old Mather Mill. This mill suffered two fires, one in 1876, after which Butler repaired the building. A second fire in 1907 completely destroyed the old mill. (Source: Center for Lowell History.)

character and too limited in their scope" and that the $40,000 demanded by Butler was too large an expenditure for the city.[48] As a result, the Lowell Waste Company continued to operate its mill and control the flowage rights.

When Butler died in 1897, Spofford assumed control of the company. Five years later Josiah Butler, Jr., who had recently graduated from Tufts College, joined the firm.[49] This was just one year after a disastrous fire had completely destroyed the company's mill along the brook.[50] After Spofford's death in 1907, the young Butler became treasurer and manager of the company.[51] A few years later he hired his cousin, Josiah Butler Goodell, to help in sales and in managing the business. Despite occasional fires that struck the factory, they prospered.[52] Josiah



This view of the Lowell Waste Company's main building facing Gorham Street was taken in April, 1959, during a fire that destroyed the company's storage warehouses on the opposite side of River Meadow Brook. Note the monitor roof (red arrow) at the third floor level of the main building. This building and the two-story section (green arrow) date from a 1901 reconstruction after a fire destroyed the entire factory. To the right (blue arrow) the old Good Templars Hall is partially visible to the right. The rear of both structures extended out upon the brook. (Photograph taken by Bill Walsh and used with his permission.)

[48] *Twenty-Third Annual Report of the Lowell Water Board and Reports of the Superintendent of Water Works and City Engineer*, 1895, (Lowell: 1896), p. 12. In all likelihood, Butler could have continued to operate the Lowell Waste Company by using only the steam engine to power the machinery. By the time of his offer, water power was no longer as critical to run the mill. The major need would have been boiler water drawn from the brook, which the city would have been legally obligated to provide.

[49] For information on Joshua Butler, Jr., see his obituary in the *Lowell Sun*, January 15, 1957. In his initial year at the Lowell Waste Company he is listed as a clerk. See the Lowell city directory for 1902.

[50] This was the second fire suffered at the mill, the first occurring in 1876. See "Old Plant Gone," *Boston Globe*, May 7, 1901.

[51] Spofford died as a result of head injuries sustained while driving his horse-drawn carriage from his home to his office. "Fatally Hurt," *Nashua Telegraph*, November 2, 1907.

[52] A factory fire in 1923 nearly injured Butler and Goodale as they tried to extinguish the blaze themselves. Another fire at the Lowell Waste Company in 1927, however, resulted in the fatality of a Lowell fireman. "Fire at Lowell Waste Company's Plant," *Lowell Sun*, March 28, 1923; "Lowell Fireman Killed at Gorham Street Blaze," *Lowell Sun*, January 31, 1927.

Butler, Jr., was evidently a capable treasurer and in 1916 the board of the Shaw Stocking Company elected him treasurer of this larger concern.[53] He remained active in the business affairs of the Waste Company until his death in 1957.[54]

The company struggled mightily after Butler died. Goodell became treasurer, but the city of Lowell claimed the company's property for back taxes in March, 1957. Goodell was assisted by J. Kendrick Butler, son of the late Joshua Butler, Jr., and the business limped along for a few more months. But another fire in the fall of 1958 heavily damaged the company's warehouse buildings on the south side of the brook. Goodell did nothing to repair the partially destroyed buildings and residents in the vicinity of Congress Street were soon complaining of an infestation of rats in and around the ruins of the wood-frame structures. In April, 1959, a second fire set by a group of local boys left only the skeletons of the buildings standing. The company finally demolished these remains and for some time thereafter the land was used as a parking lot. The final blow occurred in September, 1959, when yet another fire struck the main building, which had been unoccupied for many months and was used to store rags and cotton waste. Once again local youths had set the fire which destroyed a large section of the factory. Soon after, the remains of the main building and the adjacent two-story structure were demolished. The Lowell Waste Company, which was begun some 85 years earlier, went out of business.[55]

The charred and smoldering remains of the Lowell Waste Company's warehouses along Congress Street next to River Meadow Brood are seen in this photograph taken after the blaze was nearly extinguished in April, 1959. Note the open land in the foreground. The fire engine to the left is parked on Congress Street. Two large trees, barren in the early spring, are also seen along this street. The brook and dam are located just beyond the fire-damaged warehouses. (Photograph taken by Bill Walsh and used with his permission.)

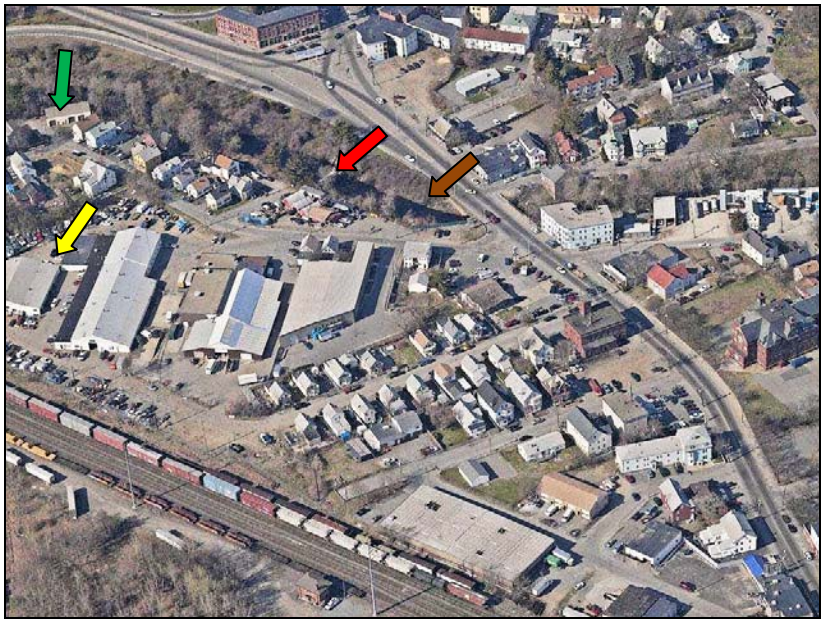
[53] "Josiah Butler," *Lowell Sun*, October 28, 1916. In addition to serving as treasurer of the Shaw Stocking Company, Butler was president of Shawprint, Inc., a successor firm to the stocking manufacturer.

[54] "Josiah Butler of Chelmsford Dies at 77," *Lowell Sun*, January 15, 1957. Butler and his wife lived for many years in Lowell on Stevens Street and moved to Chelmsford just two years before his death.

[55] The city's action to seize the Lowell Waste Company's property for back taxes is found in the Northern Middlesex Registry of Deeds, v. 1398, pp. 132-134. The fires received extensive coverage in local newspapers. See especially "City to Act on Fire Menace," *Lowell Sun*, April 9, 1959, and "Probe Warehouse Fire," *Lowell Sun*, September 6, 1959.

A few months before the fire, the company faced another problem that harkened back to the late 19th century when the dam caused a great deal of consternation. This time it was a lack of maintenance to clear away debris that had mounded up against the dam in the winter of 1958-59 and led to a flooding of property in the vicinity of Gorham Street. Most serious was a gully that had been cut into the land from the brook down to Chambers Street. Although the city reportedly notified J. Kendrick Butler of the problem he took no action. The city's public works department used heavy equipment to clear away the debris and dredge behind the dam. Butler received a bill for the cost of the work.[56]

The dam, which had been in private hands since Moses Hale constructed it in the late 18th century, and the rights to the brook's flow, which had been privately held since the 17th century, was taken out of private control. In 1960 the state assumed control of the stream, as well as a great deal of property along the brook, in preparation for the construction of the Lowell Connector.[57] The highway project included a significant channel dredging and straightening effort that vastly altered the stream location and the surrounding landscape. This massive reshaping of the brook was doubtlessly beyond the imaginings of Jerome Manning some 70 years earlier.

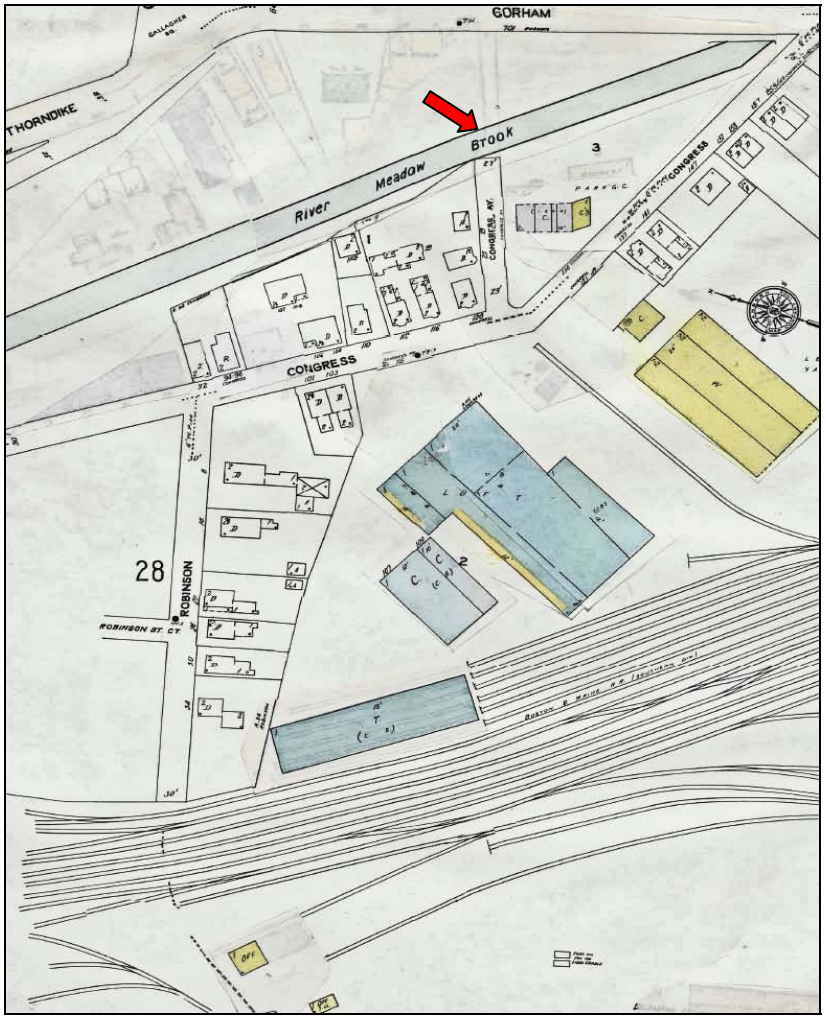


This aerial view of River Meadow Brook where it passes under Gorham Street shows the dramatic changes to the landscape as a result of the construction of the Lowell Connector. The dam (red arrow) remains in its late-18th century location. The site of Swan's mansion (yellow arrow) is now occupied by a large steel-frame building. Land that was once the site of the Lowell Wadding and Paper Company and before that the Jonathan Knowles batting mill, followed by the Alanson J. Richmond batting mill (green arrow), was removed as part of the alteration of the brook's channel when the Connector was constructed. The site of the Lowell Waste Company (brown arrow) was similarly altered with the construction of the ramp off the Connector and on to Gorham Street.

[56] "Debris Cause of Flood, Says DPU Head," *Lowell Sun*, March 9, 1959; "Cleared Dam Abates Gorham Street Flooding," *Lowell Sun*, March 10, 1959

[57] Northern Middlesex Registry of Deeds, v. 1479, p. 14.

The dam on River Meadow Brook is the most visible reminder of Hale's Mills. It was originally constructed by Moses Hale in the early 1790s to power his grist mill and saw mill. In 1823 Hale rebuilt the dam, raising its height by several inches. Hale's dam was demolished in the early 1960s and the state erected a new concrete gravity dam in the same location as part of the Lowell Connector construction.



This detail from a 1977 Lowell atlas shows the many changes to the landscape around the dam stemming from the early 1960s Lowell Connector construction. Curiously, the dam was not drawn. The red arrow indicates its location. (Source: Center for Lowell History.)

Part III: Wamesit Canal and Bleachery District

This part of River Meadow Brook, which extends from Newhall Street, downstream to the brook's confluence with the Concord River, formerly contained a number of large and small industries and an elaborate waterpower canal. The brook flows largely eastward from Newhall Street with most of the industrial buildings located along the south bank. The history of land and water use in this area is closely linked to three major industrial developments: (1) Whipple's Canal, from the early 1820s to the mid 1860s; (2) The Wamesit Power Company, from the mid-1860s to the present time; and (3) the Bleachery, from the early 1830s to the present time. A brief history of each of these major developments, as well as the leading industrialists and entrepreneurs who figured prominently in these various industries, now follows.

Whipple's Canal

Of the several water-powered industrial developments along the Concord River in the early 19th century, the gunpowder works of Oliver M. Whipple was one of the most extensive. Born in Wethersfield, Vermont, in 1794, Whipple, at the age of 21, left his hometown and reportedly walked to Boston with a bundle clothes and $15 in cash. He stayed only a short while before moving to Southwick, Massachusetts, where he learned the art of making gunpowder. Likely aware of the opportunity to superintend the powder works of Moses Hale on River Meadow Brook, Whipple relocated to East Chelmsford and joined the enterprise, first as a manger and, soon after, as a partner. His marriage to Sophronia Hale, a daughter of Moses, in 1821 secured his ties to the family's business interests.

It was Whipple, backed by Boston merchants William Tileston and David Hale, who constructed a much larger powder works on the Concord River in 1821, using the waterpower of the Concord River at Wamesit Falls. Whipple built a canal about 1,000 feet long, extending from the falls to the confluence of River Meadow Brook and the Concord River, and used the fall of 25 feet to power the works.[58] When completed in 1822, the powder works contained a water-powered grinding mill, using cylindrical iron rolls, six feet in diameter, instead of pestles, to grind the powder. The new works employed 10 men who produced 300,000 pounds of blasting and gunpowder each year.[59]

Although this was a sizable mill for this period in New England, it was dwarfed by the much larger works of the DuPont family on the Brandywine River in Delaware. (The DuPonts operated three works on the Brandywine with the Hagley, or Middle Works, being the largest. Workers there produced 25,000 pounds of blasting powder each day.[60]) The gunpowder at the East Chelmsford works was loaded into casks, each weighing 25 pounds, and sold under the name

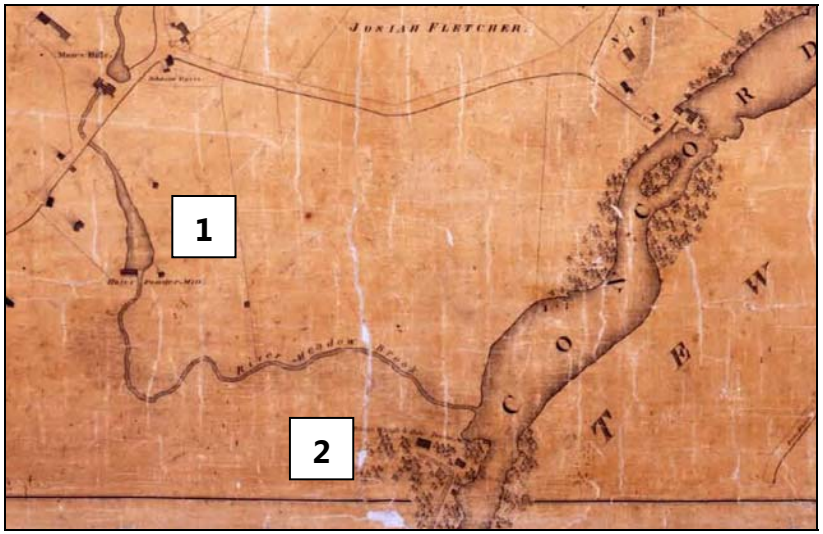
[58] Peter M. Molloy, *The Lower Merrimack Valley: An Inventory of Historic Engineering and Industrial Sites*, (Washington, DC: National Park Service, 1976), p. 69.

[59] A newspaper article describing the new works of Whipple, Tileston, and Hale appeared in the *Salem Gazette*, August 13, 1824, and included commentary that this powder mill was located "in a delightful and romantic spot upon the banks of the Concord River."

[60] J. Leander Bishop, *A History of American Manufacturers, from 1608 to 1860*, v. 2, (Philadelphia: Edward Young & Co., 1868), p. 517.

"Boston Gunpowder."[61] Whipple and his associates reaped steady profits from the sale of their gunpowder. After David Hale ceased being a partner in 1826 and Tileston withdrew three years later, Whipple became the sole proprietor.[62] Over the course of the 1830s he brought two brothers into the business. In 1833 Whipple purchased a gunpowder works on the Presumpscot River in Gorham, Maine, and placed one brother, Lucius, in charge of this plant.[63]

About five years later, Oliver Whipple acquired a waterpower site in Exeter, New Hampshire, on the Exeter River at King's Falls, and established another gunpowder factory.[64] Whipple also leased a warehouse in Salem, Massachusetts, for exporting the powder produced on the Concord River. Casks were transported by covered wagons, pulled by four to six horses, and delivered to the Salem "Powder House." Large amounts of Whipple's exported gunpowder were shipped to Africa as this commerce played a role in the late stages of the African slave trade with the Americas.[65]



This section of an 1825 map of Chelmsford clearly shows the locations of the two gunpowder mills: (1) the earliest on River Meadow Brook, established by Moses Hale in 1818; (2) the second, along the Concord River, established by Oliver Whipple and William Tileston in 1821-22. (Source: George R. Baldwin, "A Plan of Land and Buildings Belonging to the Merrimack Manufacturing Company … Pawtucket, in the Town of Chelmsford," 1825.)

Just as disastrous explosions wreaked havoc at the River Meadow Brook gunpowder factory, Whipple's mills suffered a number of horrible blasts. One in 1837 occurred in the drying house and claimed the lives of two men. Another blast occurred in early 1843 when Marshall Kinsman and George Shedd, about to begin repairs in the "Press House" at eleven o'clock in the evening, accidentally ignited gunpowder dust with Kinsman's lantern. The building splintered apart as it caught fire, showering the works with incendiary debris. Both

[61] Bishop, *A History of American Manufacturers*, v. 2, p. 246.
[62] David Hale remained as selling agent for Whipple and Tileston after the partnership was dissolved in 1826. A notice of this new arrangement was published in a number of newspapers. For example, see "Dissolution of Co-partnership," *Boston Commercial Gazette*, July 17, 1826.
[63] Hugh D. McLellan, *History of Gorham, ME*, (Portland, ME: Smith & Sale, 1903), p. 274.
[64] Charles H. Bell, *History of the Town of Exeter, New Hampshire*, (Boston: J.E. Farwell & Co., 1888), p. 330.
[65] William L. Welch, "Salem Neck and Winter Island," *Essex Institute Historical Collections*, v. 33, (Salem, MA: Salem Press, 1898), p. 98.

men were hurled through the air and Shedd's clothes were aflame. Remarkably neither man was killed and Shedd extinguished his burning clothing by rolling in the snow. One-half hour later a second explosion rocked another mill building, in which gunpowder had recently been mixed. It was ignited by a burning piece of wood from the obliterated Press House. Although no one was killed from the second blast, a number of Whipple's powder works buildings were severely damaged and he sustained a loss of $3,000. The nearest resident John G. Locke, whose "Wamesit Cottage" stood about 1,000 feet from the powder works, had all of his windows shattered.[66]

Industrial Growth at "Whipple's Mills"

The losses Whipple sustained over the years at the powder works were greatly offset by the profits he amassed not only from his gunpowder business, but also from the considerable real estate he owned in Lowell along the Concord River and west beyond Lawrence Street. Near the Lowell Bleachery, on River Meadow Brook, he constructed a group of factory buildings and leased space to a number of small manufacturing concerns. In 1851 this included James Patterson's carpet mill, Aaron Cowley's woolen mill, two smaller carpet mills operated by James Siner and Roger Lang, Henry Crowther's dyeing and finishing works, and Smith & Meadowcroft's blacksmith shop.[67] Additionally, Whipple constructed a number of tenements and cottages that he rented to his workers and other Lowell residents.

For many years Whipple was the largest individual taxpayer in the city, with his annual tax bill typically amounting to about $1,500, more than ten times the typical annual wage paid to a Lowell textile worker.[68] Active in local politics Whipple helped draw up the original city charter and won election as an alderman when Lowell was first incorporated as a city in 1836. A few years later he served four terms at a state representative from Lowell and was a long-standing member of the Whig party that dominated the city for nearly a generation. Whipple lived in a sizeable, though unostentatious wood-frame dwelling, that he built on Whipple and Moore streets in the 1830s. He married three times (Sophronia Hale, 1821-1836; Julia Ann Wentworth, 1837-1843; Sarah Kinsman, 1844-1872) and had ten children.[69] Whipple was also a founder of the Lowell Cemetery, across from his works on the Concord River, where he, his family members, and several of those killed at his gunpowder factory were buried.

Suffering from ill health in 1855, Whipple discontinued the manufacture of gunpowder in Lowell and shipped some of the

[66] Afflicting Event," *Lowell Courier*, March 30, 1837; "Tremendous Explosion," *Lowell Advertiser*, February 25, 1847. One of the worst explosion occurred at Whipple's Powder Works in Gorham, Maine, in 1855. The blast claimed the lives of seven men, including James Whipple, a brother of Oliver, and Oliver G. Whipple, Oliver's son. McLellan, *History of Gorham, ME*, p. 274. It was in 1855 when Oliver Whipple discontinued his involvement in the manufacture of gunpowder. The loss of his son and brother, along with ill health, likely contributed to Whipple's decision to withdraw from this enterprise

[67] Lowell city directory for 1851. The buildings associated with Whipple's mills are seen on the Lowell city atlas, 1850, prepared by Sidney & Neff, and published by S. Moody.

[68] James W. Meader, *The Merrimack River: Its Source and Its Tributaries*, (Boston: B.B. Russell, 1869), p. 266.

[69] *Memorial Biographies of the New England Historic and Genealogical Society*, v. 7, (Boston: Stanhope Press, 1907), pp. 22-23.

This engraving of the Oliver Whipple house is from an 1850 atlas of Lowell. (Source: Center for Lowell History,)

The historic Whipple house today as seen from Moore Street.

machinery to the powder works in Gorham, Maine. He hired as his agent Ephraim B. Patch, a prominent Lowell auctioneer and real estate speculator, who managed Whipple's extensive industrial and residential properties. Patch soon played an important role in expanding manufacturing at Whipple's mills.

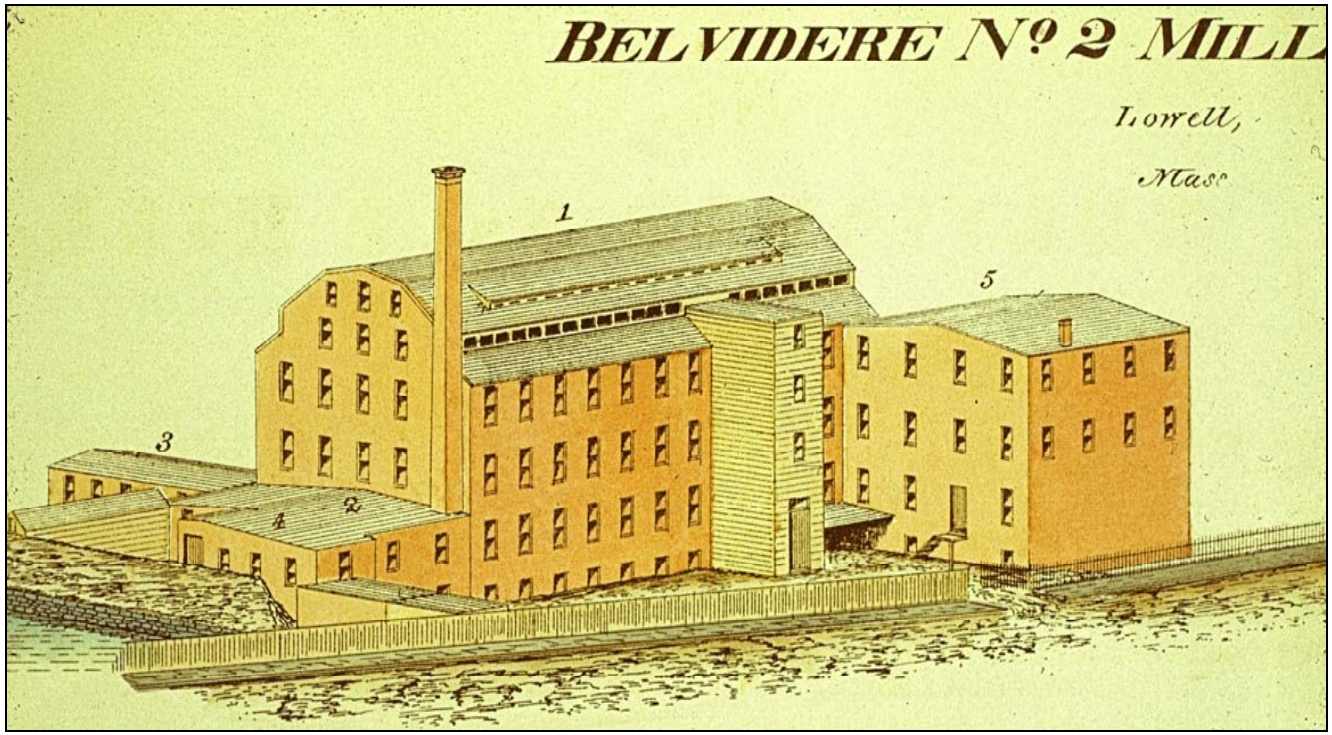
Wamesit Power Company

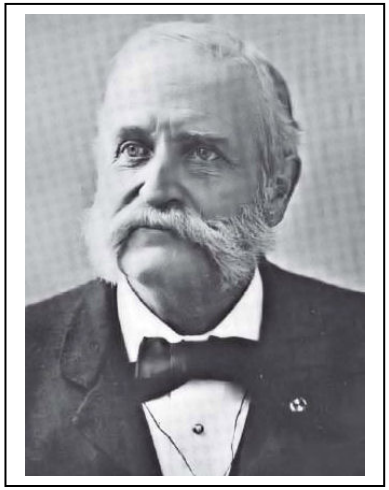
Over a seven-year period beginning in 1856, Patch oversaw the expansion of the Whipple Canal by some 500 feet, including the extension of the waterway up River Meadow Brook to the Lowell Bleachery. The canal improvements entailed the deepening (about six to eight feet) and widening (to 20 feet) of the entire waterway.[70] These major improvements led to the construction of several new factory buildings during the Civil War, including the woolen mills of Chase & Hosford, Luther W. Faulkner, and Charles Stott.[71] In 1865 Patch sold the entire Whipple property to the newly formed Wamesit Power Company, led by Benjamin F. Butler. Over the next several decades the Wamesit company would enlarge the mill district that Oliver Whipple, who died in 1872, at the age of 77, had founded.[72]

[70] Molloy, *The Lower Merrimack Valley*, p. 69. By the mid 1850s Patch had acquired property on both sides of the Concord River, thus securing for Whipple the exclusive rights to all of the water power at the Wamesit Falls.

[71] For Stott's Belvidere Woolen Mill No. 2 see "New Mill Commenced," *Lowell Daily Citizen & News*, April 26, 1862; for the Chase and Faulkner Mills see "The Chase Mills," *Lowell Daily Courier*, August 5, 1863; "Enlargement of the Chase Mill," *Lowell Weekly Journal*, March 4, 1864; "Improvements at Whipple's Mills," *Lowell Weekly Journal*, March 11, 1864; "At Whipple's Mills," *Lowell Daily Courier*, September 7, 1864.

[72] "Death of Oliver M. Whipple," *Lowell Daily Courier*, April 27, 1872; "Death of Oliver M. Whipple," *Lowell Daily Citizen & News*, April 27, 1872.





Born in Rochdale, England, in 1799, Charles Stott immigrated to the United States in 1827 and initially superintended a woolen mill in Dracut. In the 1830s he joined the Belvidere Flannel Company in Lowell on the lower Concord River and in 1851 became a partner in this firm which was reorganized as the Belvidere Woolen Manufacturing Company in 1861. Under Stott's capable management, the company built the Belvidere Woolen Mill No. 2 as shown in this ca. 1885 insurance survey drawing. Located along Lawrence Street, the mill was powered by a 75-horsepower turbine and a 100-horsepower steam engine with water from the Whipple (later Wamesit) Canal. His son, Charles A. Stott (pictured to the right), who was born in Dracut in 1835 and later was elected mayor of Lowell, assumed control of Belvidere Woolen after the elder Stott died in 1882. Although the roof of the main mill building (numbered 1 in this drawing) was subsequently altered and the monitors were removed, the factory today retains much of its original fabric.

From its inception in 1865, the Wamesit Power Company had two of Lowell's best-known political and legal men guiding the enterprise. The major investor, General Benjamin F. Butler, who had been a leader of Lowell's Democratic Party in the 1850s only to switch to the Republican Party at the outbreak of the Civil War, served as treasurer. Tappan Wentworth, who many years earlier had been a staunch Whig and ardent foe of Butler, and who had gravitated to the Republican Party before the war, was the company's president.[73] Within a year Butler appointed De Witt C. Farrington as agent. Farrington was a prominent merchant in Lowell and an official with the U.S. Treasury under General Benjamin F. Butler during the last year of the Civil War.[74]

Industrial Expansion

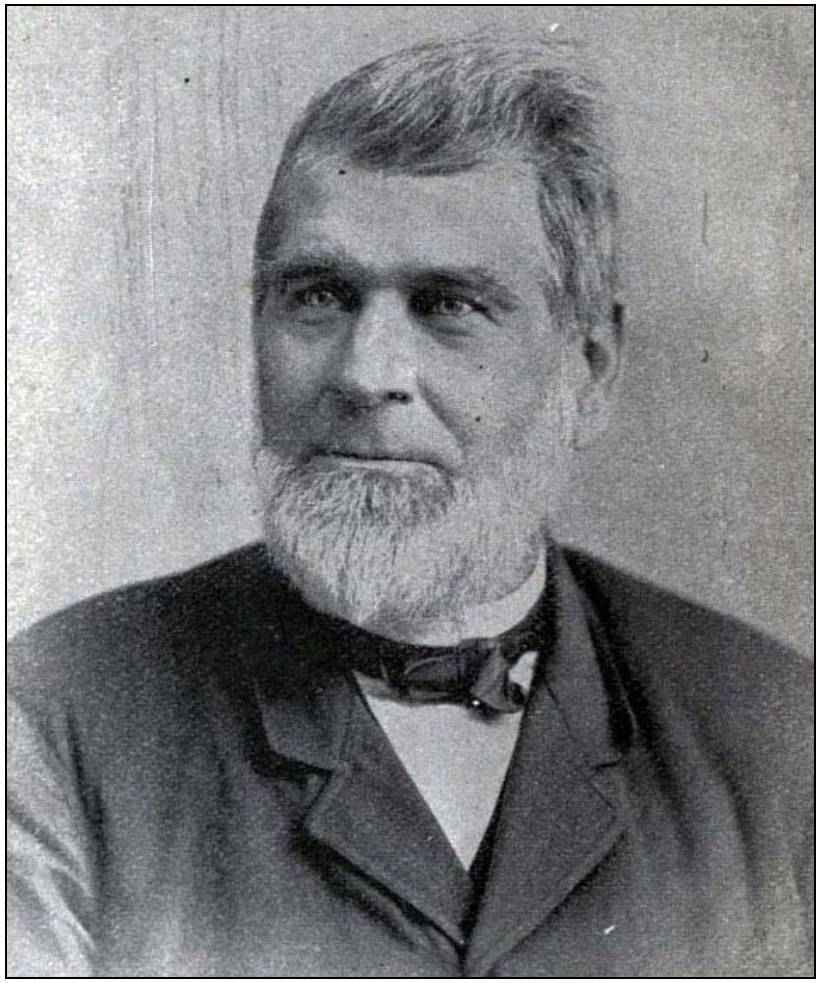
It was under Farrington that the company expanded its operation, constructing new buildings, improving the hydraulic works, and leasing factory space to additional manufacturing companies. In addition to the various industrial concerns that leased property from agent Farrington, Asa Swain of the Swain Turbine Company, which operated a factory in Lowell on Broadway and Willie streets, had a wooden flume constructed off the Wamesit Canal to test the efficiency of waterwheels. While Swain hired James B. Francis of the Locks and Canals Company to design the flume, he brought in James Emerson, a self-taught engineer and inventor, to oversee the flume's construction and conduct the testing of the efficiency of various waterwheels including the Swain turbine.[75]

This flume was located at a Wamesit Canal spillway near Charles A. Stott's recently constructed woolen mill (Stott's woolen company was subsequently reorganized and the factory was renamed the Sterling Mills), and Emerson began testing turbines in early 1869. Using a Prony brake (a dynamometer) of his devising, Emerson developed a reliable and inexpensive procedure for testing turbine efficiency. He relocated to Holyoke where he continued his testing work and published a

[73] A complete listing of Wamesit Power Company officials is noted in the Lowell city directory for 1866. The major companies Wamesit Power served and the number of employees of each included Lowell Bleachery (400), Chase Mill (200), Belvidere Woolen (100), Faulkner's Mill (50), George Naylor's Carpet Mill (75), American Bolt Company (80), U.S. Bunting Company (40), James Dugdale's Worsted Mill (75), John S. Jacques Shuttle Company (12), and Crowther & Parson's Dye Works (20). See "The South End," *Lowell Daily Citizen & News*, May 26, 1866.

[74] Born in Roxbury, Vermont, in 1825, Farrington moved to Lowell around 1850 and became partners with Samuel C. Shapleigh, specializing as auctioneers and commercial merchants. This business proved quite lucrative and Farrington soon became sole owner. By 1853, Farrington's company dealt exclusively in furniture and home furnishing sales. Likely through his connection to Butler, Farrington was appointed Cotton Agent at the U.S. Treasury Department in 1864, operating out of Fortress Monroe in the control over cotton production from confiscated plantations in Virginia and North Carolina. After the Civil War Farrington returned to Lowell and joined Butler in both the U.S. Bunting Company and the Wamesit Power Company. Biographical material on Farrington is scanty and most of the information on him is from Benjamin F. Butler, *Private and Official Correspondence of General Benjamin F. Butler during the Period of the Civil War*, v. 5, (Norwood, MA; Plimpton Press, 1917), pp. 148-149. Farrington died in 1900 at the age of 75.

[75] "Testing of Turbine Water Wheels," *[Lowell] Saturday Vox Populi*, July 30, 1870; also see Emerson's report on his work in Lowell, "Test of Turbine Water Wheels at Lowell, Mass.," *[Lowell] Saturday Vox Populi*, February 4, 1871. Also see Patrick M. Malone, *Waterpower in Lowell: Engineering and Industry in Nineteenth-Century America*, (Baltimore, MD: 2009), pp. 129-130.

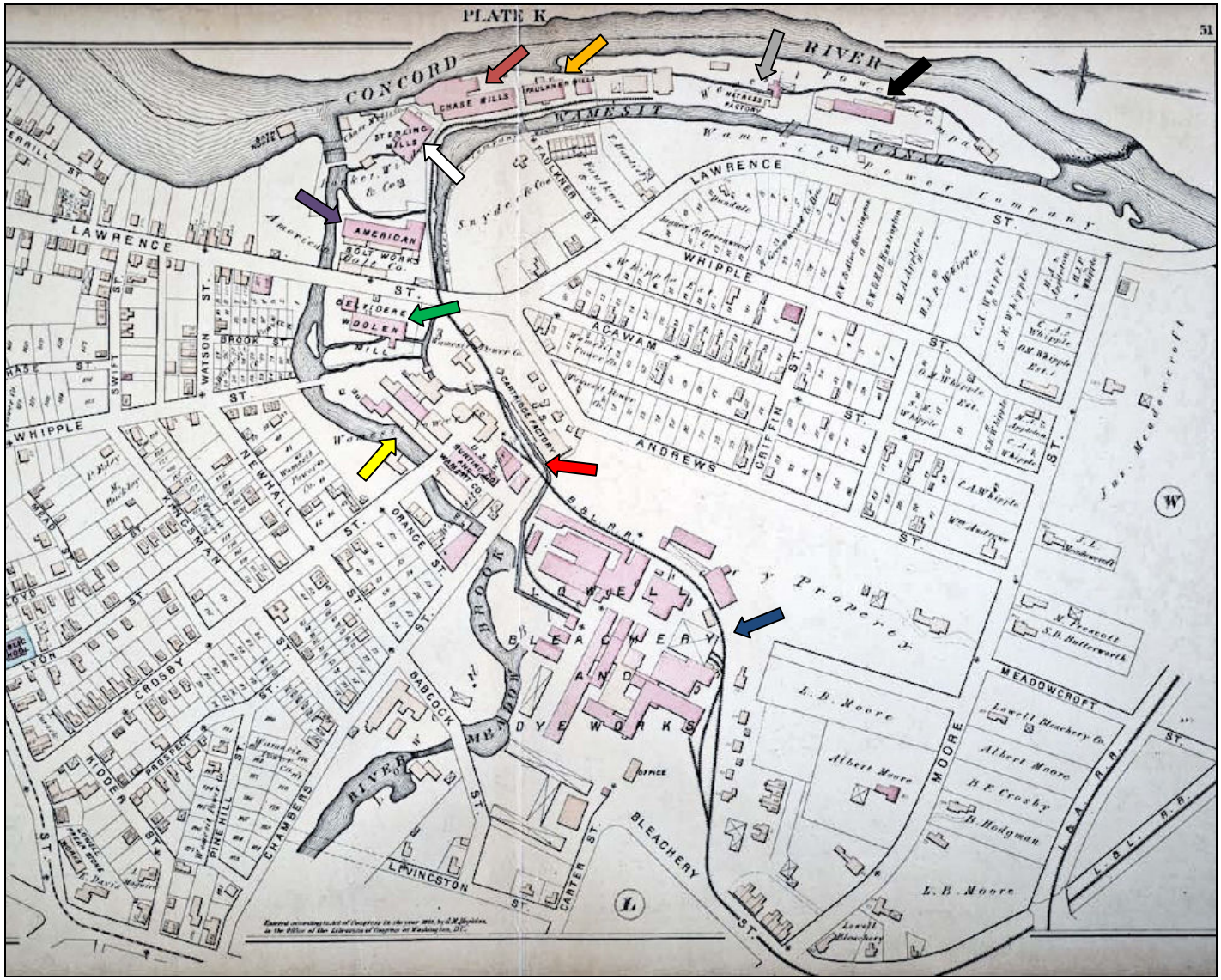


In the late 1860s James Emerson's testing of turbine efficiency using his dynamometer at a flume on the Wamesit Canal received national attention in the technical press and in a number of New England newspapers. (This image of Emerson is from his *Treatise Relative to the Testing of Waterwheels and Machinery*, 6th edition, published in 1894.)

series of treatises on turbine testing. Emerson received a great deal of attention in the technical as well as the popular press, especially for his vituperative attacks on "tonguey agents" who made spurious claims of efficiencies for waterwheels from various turbine manufacturers.[76]

About the time that Emerson departed for Holyoke in 1872 the Wamesit company supplemented its water power with the construction of an engine house and the installation of a 300-

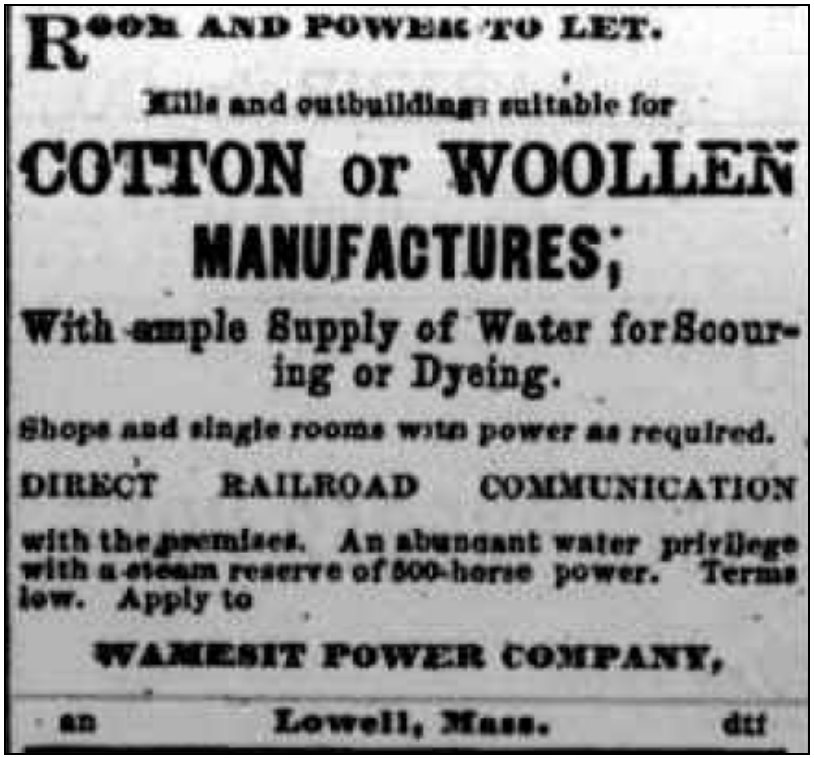
[76] Born in Bradford, New Hampshire, in 1823, Emerson shipped out to sea in his youth, but by 1850 he was married and living in Cornish, New Hampshire, where he worked as a saddler. Ten years later, before coming to Lowell Emerson was employed in Boston as a pattern maker. He began his work to improve the Prony brake in the summer of 1868 and by early the following year he was in Lowell, working for Asa Swain at the Wamesit Canal. In 1872 Emerson moved to Holyoke where he gained a national reputation for testing turbines with his patented dynamometer. A highly skillful, though cantankerous, self-taught engineer, Emerson strongly advocated equal rights for women and involved one of his daughters in turbine testing. He was also a fierce critic of mathematical theory as well as academically trained engineers, believing that empirical work in the mechanical arts, through tinkering, testing, and observation, was not just the only valid method of deriving scientific understanding, but it also harmonized with the egalitarian impulse in mankind. Several of Emerson's writings reflect his staunchly held and often cranky beliefs. This may be seen most notably in Emerson's most famous treatise in which he included not only his technical work but also essays that ranged from creating good poetry, advocating equal rights for women, and promoting nudism, to attacking the chicanery of lawyers, the ills of the legal system, the irrationality of religion, and the despotism of the Catholic Church. See James Emerson, *Treatise Relative to the Testing of Waterwheels and Machinery*, (Willimansett, MA: 1894). Emerson died in Chicopee, Massachusetts, in 1896.



This detail from the 1879 Lowell atlas shows the major features of the Wamesit Canal and the factories associated with the water power system. This includes: (1) Lowell Bleachery (blue arrow); (2) U.S. Bunting and U.S. Cartridge companies (red arrow); (3) Various small factories leasing space from the Wamesit Power Company (yellow arrow); (4) Belvidere Woolen Mill No. 2 (green arrow); (5) American Bolt Company (purple arrow); (6) Stirling Mills (white arrow); (7) Chase Mills (brown arrow); (8) Faulkner Mills (orange arrow); (9) Hapgood's Mattress factory (grey arrow); and (10) Lladnek dye works (black arrow)

horsepower Corliss steam engine. which replaced a 150-horsepower engine from the from the Gardner & Thurston works in Providence, Rhode Island.[77] By the early 1880s the Wamesit industrial district included the woolen mills of L.W. Faulkner & Sons, the Stirling woolen mills, Belvidere Woolen Company's Mill No. 2, the American Bolt Company, S. N. Wood's grist mill, and a host of smaller concerns ranging from a machine shop to a door and sash manufacturing company.[78]

Wamesit Power controlled a flow amounting to 288 cubic feet per second when the Concord River water level reached the top of the dam. These conditions occurred about eight months out of each year with lower flow in the summer months, which often substantially reduced the amount of power available to the mills. The problems of inadequate flow heightened tensions between Wamesit Power and the largest manufacturing concerns along the canal, namely the Stirling, Faulkner, and Belvidere mills, and the Lowell Bleachery. A series of lawsuits between the parties wound up in the Supreme Judicial Court of Massachusetts in 1893. In the end the judge ruled that the parties should work out an agreeable standard of technical practice in the operation of the canal's hydraulic and


ROOM AND POWER TO LET.

Mills and outbuildings suitable for

COTTON or WOOLLEN MANUFACTURES;

With ample Supply of Water for Scouring or Dyeing.

Shops and single rooms with power as required.

DIRECT RAILROAD COMMUNICATION with the premises. An abundant water privilege with a steam reserve of 500-horse power. Terms low. Apply to

WAMESIT POWER COMPANY,

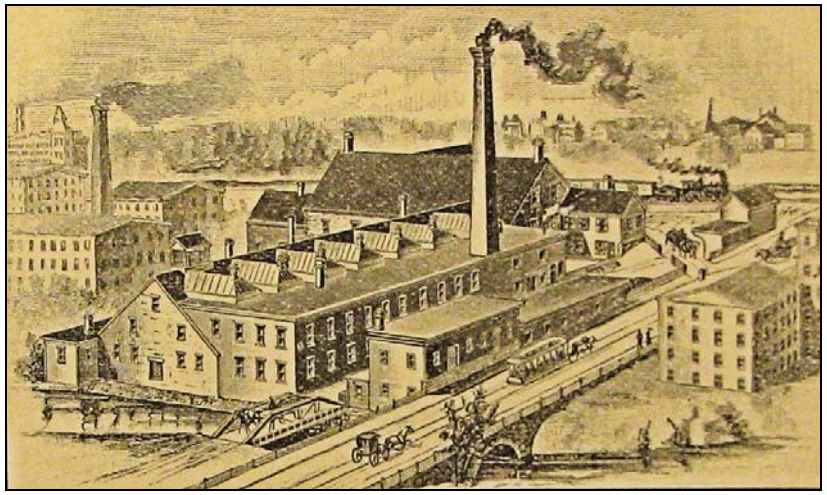
an Lowell, Mass. dtf

This ad for manufacturers of cotton or woolen goods to lease space in one of the Wamesit Power Company's industrial buildings on Wamesit Canal appeared in a Lowell newspaper in 1875. Within five years the Wamesit buildings were fully tenanted. (Source: *Lowell Daily Courier*, August 12, 1875.)

mechanical equipment, subject to the review of a court-appointed master engineer, should the parties fail to reach a compromise. In addition, the judge ordered that during periods of low flow the manufacturing concerns were entitled to a flow

[77] The Corliss engine replaced a 150-horsepower steam engine from the Gardner & Thurston works in Providence, Rhode Island, that the Wamesit company installed in its main manufacturing building along River Meadow Brook in 1866. Soon after, however, Farrington realized the company needed a more powerful engine. See "Building by the Wamesit Power Company," *Lowell Daily Courier*, August 30, 1866. The Corliss steam engine and the various industries associated with the Wamesit Power Company are described in "Concord River," *Lowell Daily Courier*, August 15, 1872.

[78] See the Lowell city directories for 1880 and 1886.



This engraving of the American Bolt Company works from 1890 also shows Lawrence Street crossing River Meadow Brook and Stott's Belvidere Mill No. 2, on the right hand side. (Source: *Lowell Mail Souvenir*, 1890.)

proportionate to the amount each received during maximum flow in the canal.[79]

[79] W.P. Trowbridge, *Reports of the Waterpower of the United State, Part I*, (Washington, DC: GPO, 1885), pp. 41-42. Trowbridge, who served as "Chief Special Agent" for the U.S. Census, produced this report in conjunction with the "Statistics of Power and Machinery Employed in the United States," which was part of the 1880 federal census work. He documented the amount of flow each that of the companies received on the Wamesit Canal. W.P. Trowbridge, *Reports of the Waterpower of the United State, Part I*, (Washington, DC: GPO, 1885), pp. 41-42. A summary of the Supreme Court case appears in *The Northeastern Reporter, Concerning All the Decisions of the Supreme Courts of Massachusetts, Ohio, Illinois, Indiana; Appellate Court of Indiana and the Court of Appeals of New York*, v. 33, February 24, June 2, 1893, (St. Paul, MN: West Publishing Co., 1893), pp. 503-508.

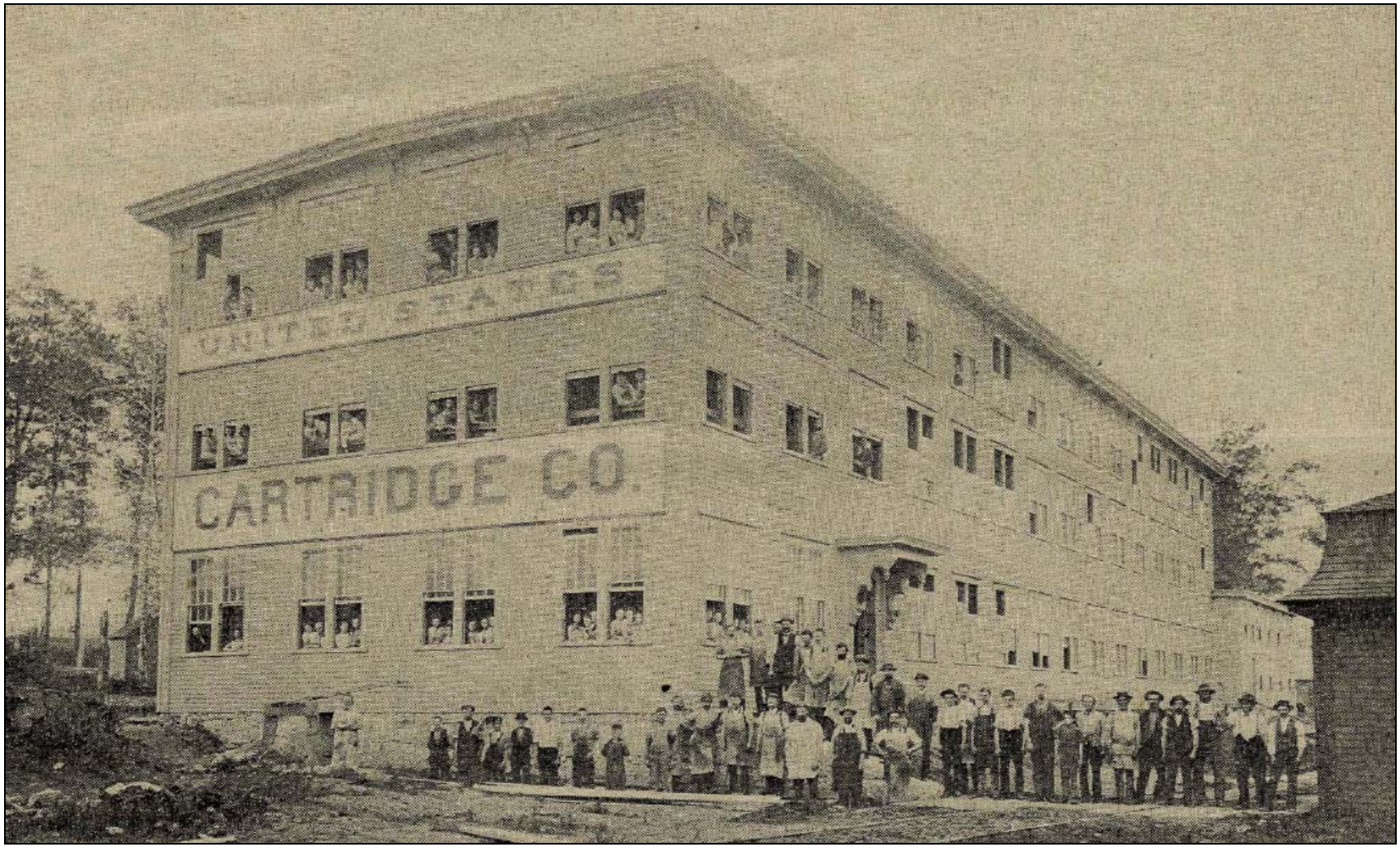
The Paul Butler Era

The same year that the court handed down its decision Benjamin Butler died. His son, Paul Israel Butler, assumed control of the Wamesit Power Company. Born in Lowell on July 4, 1852, young Butler received his early education in the city's public schools and then studied in Heidelberg, Germany, prior to entering Harvard. He graduated in 1875 at which time he joined his father in the Wamesit company and began his association with the U.S. Cartridge Company, another Butler family enterprise. By 1900 Butler was serving as treasurer of Wamesit Power and the cartridge company. He also held a controlling interest in the Middlesex Mils, U.S. Bunting, and the Whittier Cotton Company.[80] When Farrington retired as agent of Wamesit Power in 1894 Butler Ames, a nephew of Paul Butler, assumed his duties.[81]

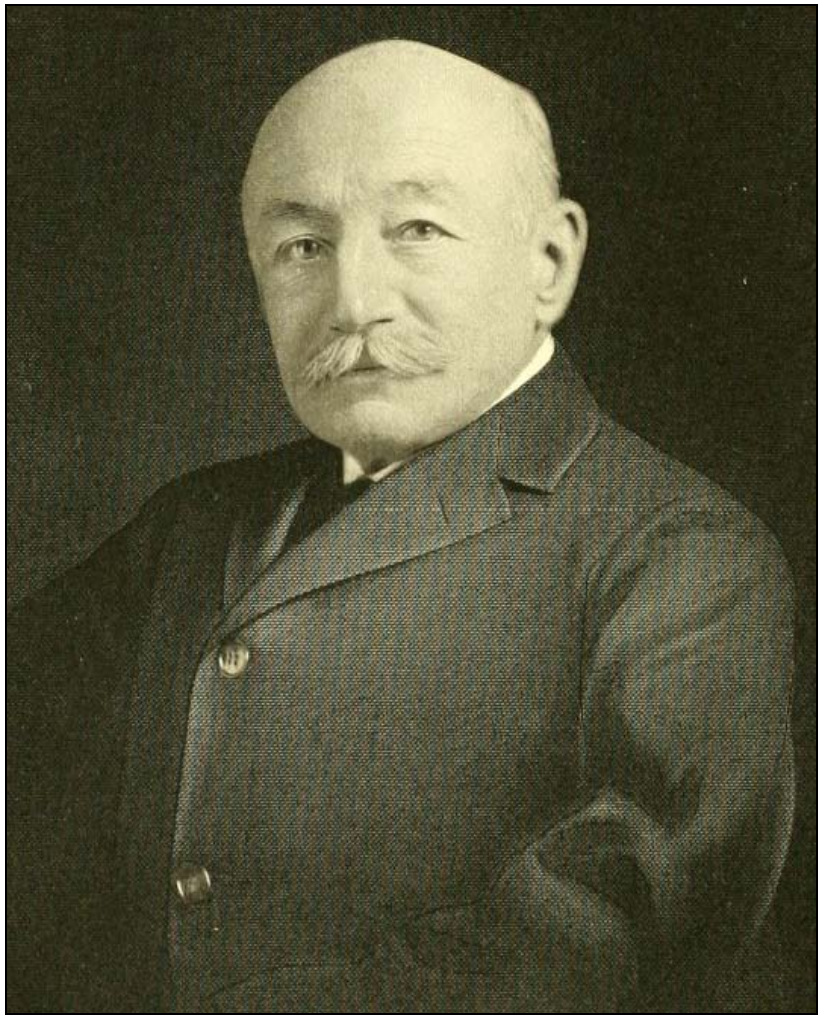
Under the aegis of Paul Butler, the Wamesit Power Company undertook a series of modest improvements. In 1906, the canal on the west side of Lawrence, leading into the U.S. Cartridge Company, Heinz Electric, and, beyond, to the bleachery, was rerouted and a reinforced concrete culvert was built. On top of this concrete channel railroad tracks were installed for the spur lines that extended along the factory buildings. In addition, Wamesit Power constructed a small electric generating station

[80] Frederick W. Coburn, *History of Lowell and Its People*, v. 3, (New York: Lewis Publishing Company, 1920), pp. 6a-6b. Benjamin Butler had formed the U.S. Cartridge Company in 1869.

[81] The best source for the Butler and Ames family involvement in the Wamesit Power Company is Ames Stevens, "Hither and Yon with Spindle and Loom," unpublished manuscript, 1976, copies available at the American Textile History Museum. See especially chapters 1, 5 & 11.



This photograph of the United States Cartridge Company, which was established in 1869, dates from the early 1870s. The Wamesit Canal extended along the north side of the three-story wood-frame factory building, next to the trees that are visible on the left-hand side of the photo. (Source: U.S. Cartridge Company, *Factory Notes*, v. 2, no. 1, February, 1917, p. 16, courtesy of Lowell Historical Society).



The son of Benjamin F. Butler, Paul Israel Butler directed the Wamesit Power Company from 1893 until his death in 1918. (Portrait of Paul Butler from Frederick Coburn's *History of Lowell*, v. 3.)

and transformer building for running electricity into its factories.[82]

As in previous years the major income of the Wamesit was derived from selling its water and steam power (the company had constructed a steam plant to augment its power generation during periods of low flow) and leasing factory space to the industrial companies operating on its premises. By the early 1900s the major concerns connected to the Wamesit included the U.S. Cartridge Company, U.S. Bunting, the American Woolen Company's Bay State Mills (formerly L.W. Faulkner & Sons), the Hockmeyers' Waterhead Mills, the Stirling Mills, the Lowell Bleachery, and the Belvidere Woolen Company.[83]

This heavy concentration of industry along the Concord River and extending up River Meadow Brook contributed to the poor water quality in the lower section of the stream. A wool scouring building of the Stirling Mills, constructed across the brook in 1907, contained carbonizing machinery which included a large basin for the acid wash of raw wool that removed oils and cellulose fibers from the wool prior to carding and spinning. Steel grates in the floor allowed waste water and acid to be dumped directly into the brook. Along

[82] "A Concrete Canal," *Lowell Sun*, September 8, 1906. It is not clear when the electric generating station was built, but judging from the surviving building it appears to date from the 1910s.

[83] In addition, the Wamesit Power Company purchased the property of the former William Walker mill at Massic Falls, just below Wamesit Falls. Wamesit Power subsequently acquired water power property on the east side of the Concord River at the Middlesex dam, thus giving the company control of significant amounts the river's flow at all three dams on the river in Lowell.

Portrait of Butler Ames, ca. 1890s. (Source: Frank E. Edwards, *The '98 Campaign of the 6th Massachusetts*, published in Boston, 1899, p. 283.)

with large amounts of chlorine and other chemicals that the Lowell Bleachery deposited into the stream, the effluents from the Stirling Mills and the Belvidere Woolen Company likely created some "dead zones" near the confluence of the brook with the Concord River. A state-conducted study of pollution of River Meadow Brook revealed the extent to which industries connected to the Wamesit Power Company were fouling the stream's waters, but this report did not alter the waste disposal practices of any of these manufacturers.[84]

The Era of Ames and Stevens

Although the Wamesit Power Company remained profitable through World War I, the firm began a steady decline in the 1920s. Paul Butler died in 1918 and Butler Ames, serving as treasurer of the Wamesit, appointed another family relative, Ames Stevens, as agent. The son of Charles Brooks Stevens, Ames Stevens followed a path similar to a number of his male relatives: He was educated at Phillips-Exeter and graduated from Harvard, after which he was hired into the family textile business. He began work at U.S. Bunting, but was there only a short while before his uncle Butler Ames appointed him agent of the Wamesit Power Company. Stevens then divided his duties between U.S. Bunting and the Wamesit. The severe recession in the early 1920s sorely tested young Stevens' managerial skills.[85]

For Stevens and the Wamesit Power Company, the most significant blow occurred in 1926 when the National Lead Company, which had purchased a controlling interest in the U.S. Cartridge Company in 1919, closed the Lowell cartridge

[84] Massachusetts State Department of Health, "Special Report of the State Department of Health Relative to the Condition of Hale or River Meadow Brook in the City of Lowell, "*Second Annual Report of the State Department of Health of Massachusetts*, (Boston: 1917), pp. 332-337

[85] Charles Brooks Stevens married into the Butler family when he wed Edith Holmes Ames in Lowell in 1896. Edith Ames was a daughter of Adelbert and Blanche Ames, and her grandfather was Benjamin Butler.

plant.[86] Another financial blow occurred in 1927 when the American Woolen Company closed the Bay State Mills. This was followed three years later when the Lowell Bleachery, a major user of Wamesit Canal water, ceased operations. Thus, with the exception of the Stirling Mills, the largest industrial concerns served by the Wamesit had pulled out and many of the buildings were subsequently occupied by small companies. The notable exception was the Bay State Mills, which Butler Ames purchased at auction in 1933, but the factory remained vacant until its demolition in 1937.[87]

Despite these significant losses, The Wamesit Power Company limped along. Under the direction of Butler Ames, who remained as treasurer, and C. Brooks Stevens, brother of Ames Stevens, who joined the company in the 1920s, the Wamesit never turned a profit, but, on the other hand, it was not a large money loser.[88] Ames and the Stevens brothers struggled to find suitable tenants. In 1936 Ames and the major shareholders decided to sell the Waterhead Mills to the company's owner, Otto Hockmeyer.[89] Rising demand for textiles and other goods during World War II temporarily improved the financial interests of the company. Butler Ames purchased the factory buildings of the U. S. Cartridge Company which had a number of tenants.[90] But the post-war years were marked by further struggles.

When U.S. Bunting ceased operations in 1947 Butler Ames and the Stevens family decided to sell the Wamesit Power Company. Finding a buyer proved difficult, however, and for nearly seven more years the Stevens brothers continued to lease the industrial properties along the brook and the Concord River. Finally, in 1954, they settled upon an offer from Arnold Bacon and Menas Barsorian, shoe manufacturers in Lowell.[91]

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[86] The National Lead Company, a major provider of lead to the U.S. Cartridge Company, acquired a large interest in the cartridge company in 1910. This acquisition stemmed from financial difficulties of the cartridge maker in the wake of anti-trust laws that eliminated price fixing between the Remington Arms, Winchester, and U.S. Cartridge companies. This initial sale in 1910 is noted in "National Lead," *Wall Street Journal*, May 5, 1910. After Paul Butler's death in 1918, the estate sold its remaining interest to National Lead. This is noted in Stevens, "Spindle and Loom," p. 4. For the closing see "Lowell Plant Likely To Shut," *Boston Globe*, July 18, 1926, 1922; "Will Seek Intervention of U.S. Government to Keep Cartridge Co. in this City," *Lowell Courier-Citizen*, October 19, 1926; "Take Steps to Keep Cartridge Shop Here," *Lowell Courier-Citizen*, October 26, 1926; "Cartridge Plant to be Vacated by Jan. 1," *Lowell Courier-Citizen*, October 12, 1926.

[87] "Bay State Mills to Close Saturday," *Lowell Sun*, March 14, 1927; "Wamesit Power Co. Buys Bay State Mills of American Woolen," *Lowell Sun*, February 28, 1933.; "May Raze Old Faulkner Mill," *Lowell Sun*, July 30, 1937.

[88] Stevens, "Spindle and Loom," p. 57

[89] This transaction is seen in the Northern Middlesex Registry of Deeds (Lowell), v. 886, pp. 395-400.

[90] Only about one-quarter of the space in the mills was vacant. See "Old Cartridge Plant Sold for $5000," *Lowell Sun*, December 28, 1943.

[91] After World War II, Ames Stevens continued to try to lease space in the various vacant industrial properties. In 1953, shortly before selling the company, the Wamesit attracted three small manufacturing concerns. This included a plastics company, an insulated wire producer, and a grain maker that processed brewery grain and livestock feed. See "New Small Businesses for Lowell, Will Employ About 60 Workers," *Lowell Sun*, May 5, 1953. The grain producer, based in Colchester, Connecticut, proved to be a problem for Crosby Street residents who complained to the Lowell Board

Bacon and Barsorian purchased Wamesit Power and the company's buildings, canal, and water rights passed into the hands of these two men. The Stevens brothers, in turn, leased space for their Ames Worsted Company from Wamesit Power until about 1955, when they closed down their firm.[92]

The Post-1950s Era

During the years that the Ames and Stevens families owned Wamesit Power, the company sold various parcels of its property either to industrial concerns, such as the Ingham Worsted Company and American Hide & Leather, or to private individuals.[93] This selling of real estate continued after Bacon and Barsorian acquired the company. The two men also continued the practice of leasing space within the company-owned industrial buildings.[94] It was not long, however, before the Wamesit company struggled financially. As early as 1960 the city of Lowell took various parcels of land for the company's failure to pay its property taxes.[95] Bacon and Barsorian took out a second mortgage on the Wamesit property in 1963 and this appears to have helped the company stay afloat.[96] By 1969, however, the company had again fallen

This view of Ames Worsted, formerly the United States Bunting Company, dates from 1950, four years before the Stevens family sold the Wamesit Power Company to Bacon and Barsorian. River Meadow Brook (red arrow) flows underneath a part of the one-story building at the center of the photograph. (Source: Stevens, *Hither and Yon with Spindle and Loom*, 1976.)

of Health about the horrific odors that emanated from the company's plant. See "600 Protest Crosby Street Plant's Odors," *Lowell Sun*, May 17, 1953.

[92] Lowell city directories, 1932, 1938, 1956 & 1964; Barsorian and Bacon paid $175,000 for the Wamesit Power Company and its property. Stevens, "Spindle and Loom," p. 57.

[93] Property sales to these industrial concerns are found in the Northern Middlesex Registry of Deeds, Lowell (1944), v. 1009, p. 73; and Lowell (1947), v. 1066, p. 159. Wamesit Power also sold land to individuals such as H. Hunter Olney, Lowell (1942), v. 987, p. 200; as well as to members of the ownership group such as Butler Ames, Lowell (1944), v. 1004, p. 337.

[94] They met with only marginal success. In one instance the company attracted two firms, one an electronic parts manufacturing concern and the other, Ideal Products, Inc., an adhesives producer."Two New Firms for Crosby Street Sector," *Lowell Sun*, February 5, 1956.

[95] The city of Lowell posted ads for sale of the Wamesit properties for back taxes. See for example, the classified ads in the *Lowell Sunday Sun*, March 12, 1961.

[96] The sale is recorded in the Northern Middlesex Registry of Deeds, Book 1628, pp. 295-297. This transaction occurred on November 26, 1963 and the selling price was $175,000, which was $25,000 more than Barsorian and Bacon paid for the Wamesit Power Company in 1954.

behind in its property taxes and the city advertised the sale of Wamesit real estate for back taxes.[97] Menas Barsorian died in 1970 leaving Arnold Bacon as the chief executive of the Wamesit Power Company. Arnold sold his long-struggling company to a Boston firm that formed the Wamesit Real Estate Trust, with Barbara Murphy as trustee, prior to the transaction.[98]

Behind this company were a group of Boston real estate developers, including Geoffrey Little, Edward Mank, and G. Daniel Prigmore. Prigmore was adept at rehabilitating old industrial buildings and converting them into housing.[99] The three men carried out a redevelopment plan of their holdings along River Meadow Brook and the Concord River, naming their property the Wamesit Industrial Park. In addition to the Wamesit Canal, seven industrial buildings dating from as early as the 1820s (structures associated with the Whipple gunpowder works), the 1870s, and through the 1920s, were located within the 20-acre site. The improvements included some demolition (most notably the Wamesit Power Company's old steam engine house), new parking lots, and new windows, doors, and lighting for industrial spaces on the first floor of a number of mill buildings. Their tenants included Commodore Foods, Inc., the Carol Shoe Company, Amalgamated Plastics Corporation, Vertipile, Spartan Precision Machining Company, and Joan Fabrics.

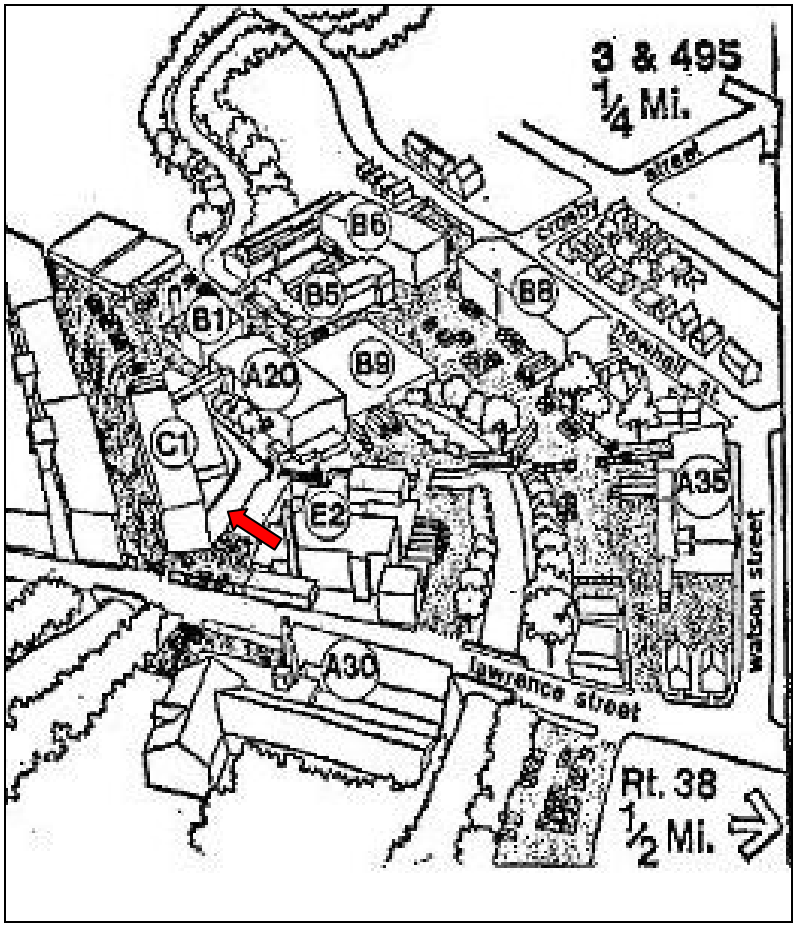
This image of the Wamesit Falls dam and the southernmost point of Centennial Island was taken by local photographer Bill Walsh in 1961. The building in the foreground is part of the former Waterhead Mills operated by the Hockmeyer family. At this time it was occupied by Mel Hoffman's furniture company. The gatehouse at the head of the Wamesit Canal is seen to the left. (Photo courtesy of Bill Walsh.)

[97] Between 1970 and 1972, the city ran a series of classified ads announcing the sale of Wamesit properties for back taxes.

[98] "Developers See Profit in Rehabilitating Old Mill Site," *Lowell Sunday Sun*, September 8, 1974.

[99] One such project was an old gun-making factory in Boston. See "Old Gun Factory Converted into Housing Project," *Berkshire Eagle*, November 23, 1974.

Prigmore also sought to sell the property of the historic Whipple Powder Works to the Massachusetts Department of Natural Resources (DNR) and advocated for a state park on the Concord River at Centennial Island and extending along the Wamesit Canal. At this time the DNR was studying the creation of a state park encompassing the property of the Locks and Canals Company in downtown Lowell and Prigmore maintained that incorporating the Concord River area would hasten further redevelopment of the former mill district in this part of the city. Central to this park were the Whipple buildings, located on the south side of River Meadow Brook, along the Wamesit Canal. "I believe in this thing," Prigmore stated, "but the groundwork has to be laid, the state has to commit funding, and the city has to decide on its priorities."[100] While the state chose to establish a heritage park in downtown Lowell, it opted not to include the canal and mill district along the Concord River. Despite local preservation attempts to save one of the most important industrial landmarks that predated Lowell, the city declared the Whipple powder works a public nuisance and ordered Prigmore's Wamesit Power Company to demolish the buildings. As a result one of the area's most important early industrial landmarks was lost.[101]



This drawing of the Wamesit Industrial Park dates from 1974, soon after Arnold Bacon sold the Wamesit Power Company to the Wamesit Real Estate Trust. Note that the Wamesit Canal (red arrow) still extends on the west side of Lawrence Street. (Source: *Lowell Sun*, May 12, 1974.)

[100] "Exciting Future Ahead for Potential Eyesores," *The Lowell Sun Sunday Magazine*, February 23, 1975.

[101] The remains of the Whipple gunpowder mill had been considered one of the important historic sites in an early proposal for a national park in Lowell. See "Five-Site Urban Park Outlined," *Lowell Sun*, April 20, 1975. A local librarian, Jack Hall, was among the foremost preservation advocates of the powder mill and he attempted to raise funds to stabilize the buildings using vocational school students for the work. See "Librarian Hasn't Given Up Plan to Restore Whipple Powder Mill," *Lowell Sun*, June 9, 1977. The municipal order to the Wamesit Power Company to demolish the buildings is noted in "Historic Mill Faces Demolition," *Lowell Sun*, October 8, 1976.

Prigmore and his partners continued to seek tenants for the remaining vacant industrial properties. In 1977, Digital Equipment Corporation of Maynard, Massachusetts, approached Prigmore about the potential to move part of its operation to Lowell and locate in the one of the large brick mills of the former U.S. Cartridge Company. As negotiations were underway, an arsonist torched the structure and only the shell of the building remained after this destructive blaze was extinguished. Digital officials quickly ended their discussions with Prigmore and decided against a move to Lowell.[102]

About two years after this destructive fire, Prigmore and his partners decided to sell the Wamesit Power Company to Kenneth Scagel of Billerica. Scagel was a founder of the DeWire Fabricating Company, a copper wire and blasting cable manufacturer that operated in the old American Bolt Company factory. He and his son, Kenneth, Jr., had purchased industrial real estate, including property in the former Lawrence Mills complex, under the name of Atlantic Associates, Inc. In 1980, undoubtedly aware that the Wamesit Real Estate Trust was seeking a buyer of the Wamesit Power Company property, Scagel paid $150,000 for the land, buildings, and canal.

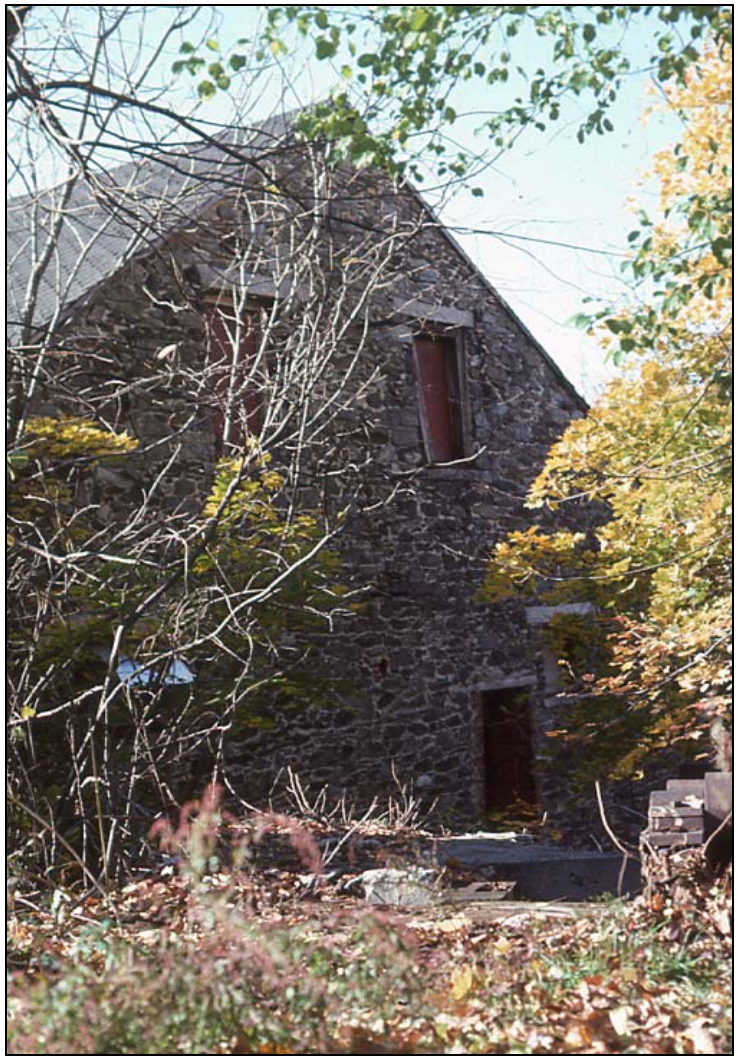
At the same time, Scagel and his son were among the partners who formed the Massachusetts Bay Power Company with the aim of developing a small hydroelectric plant on the Concord

This view of the Wamesit Canal is looking north from the railroad tracks that once extended on Centennial Island. The low-lying gable roof building (red arrow) is part of the former Whipple gunpowder mill. The stack once served the Bay State Mills, formerly the Faulkner Mills. (Photograph taken in 1961 by Bill Walsh and used with his permission.)

[102] "Fire Officials Say Huge Blaze which Gutted Mill Was 'Deliberately Set,'" *Lowell Sun*, December 27, 1977; "Mill Fire Ended Plan to Locate New Firm in Lawrence St. Complex," *Lowell Sun*, December 28, 1977.

This rubble granite building with a gable-roof was part of the Whipple Powder Mill constructed in 1821-22. In 1847 Oliver Whipple leased a section of this factory to James Meadowcroft and George Smith who manufactured iron bolts and fasteners. After Whipple ceased gunpowder production in 1855, the two men purchased the building from Whipple and subsequently reorganized the firm as the American Bolt Company. Whipple's Canal supplied water to the waterwheel in the basement of the building. In addition, Meadowcroft and Smith constructed a boiler and powerhouse and installed a steam engine to supplement the water power. About a decade after the formation of the Wamesit Power Company, a new penstock and turbine were installed to improve the water power from the canal. This photograph dates from 1975, prior to the conversion of the building into housing. (Photograph courtesy of Dr. Patrick Malone, Brown University.)

This photograph of the dual turbines of the Wamesit Power Company was taken in 1975. The Wamesit Canal extended from the west side of Lawrence Street (at the top of the hill in this photo) and ran by the brick substation (red arrow). Note that the stone-lined wasteway (yellow arrow) is conducting water from the canal into the tailrace below. The metal stacks for each of the turbines served as the surge tanks for each unit. These dual turbines were likely installed in the early 1900s, when Paul Butler was president of the Wamesit Power Company. The wasteway, penstocks, and parts of these turbines survive today. The canal west of Lawrence Street, however, no longer carries Concord River water and only sections of the canal prism are extant. (Photograph courtesy of Dr. Patrick Malone, Brown University.)



This building which was associated with the original Whipple Powder Mill, was demolished in 1977. (Photograph courtesy of Dr. Patrick Malone, Brown University.)

to be located on the river below the ruins of the former Bay State Mill. The Federal Energy Regulatory Commission (FERC) approved the project in 1981 and declared Massachusetts Bay Power exempt from federal licensing.[103] The Scagels, however, found it difficult to secure funding for the project and work was delayed until 1987.

The following year construction began with repairs to the Wamesit Canal and excavation for the raceway and power plant on Centennial Island. This included dynamiting and removing soil and rock. The Lowell Conservation Commission soon halted this work, charging that the Scagels failed to secure the necessary environmental permits. Pressure from members of the Massachusetts Congressional Delegation led to a hearing between the FERC and Massachusetts Bay Power. In the end, faced with mounting fines for violating environmental laws, the Scagels gave up the project and sold the property to a newly formed concern, the Centennial Island Hydroelectric Company, headed by Jerome Olson. Olson oversaw the construction of the 650-kilowatt automated hydroelectric plant, which came online in 1990.[104]

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[103] For small hydroelectric projects of five megawatts or less FERC, by law, was given the authority to exempt companies like Massachusetts Bay Power from the licensing process. The proposed project is reported in "Hydroelectric Project in Lowell Gets Grant," *Boston Globe*, April 16, 1980.

[104] The controversy surrounding the Scagels' attempt to build the project, as well as the FERC hearing and the emergence of Olson's Centennial Island Hydroelectric Company , are found in "Politicians Enter Fray in Lowell," *The [Nashua] Telegraph*, April 18, 1988; "Agency Orders Cleanup at Lowell Hydro Project, *Boston Globe*, May 1, 1988; "Hearing Scheduled on

Currently, the major functioning elements of the Wamesit Power Company's historical development of water power on the Concord River and along River Meadow Brook are the dam at Wamesit Falls, the headgates, and the canal that leads to the raceway of the automated hydroelectric plant. Although a number of mill buildings associated with the Wamesit Canal were either demolished or destroyed by fire, several significant historic structures survive.[105] This includes parts of the former U.S. Cartridge Company, the U.S. Bunting Company, Ames Worsted, Stott's Belvidere Mill No. 2, the American Bolt Company factory, and the Stirling Mills.

Lowell Bleachery

Prior to 1832, when the Lowell Bleachery was incorporated in Massachusetts, there were two bleacheries in Lowell. One was located within the Merrimack Mills and the other within the Hamilton Mills. The construction of additional cotton mills, however, created a demand for more bleaching of cotton goods. This opportunity led three men to form the Lowell Bleachery, with a rather modest capitalization of $50,000, "for the purpose of bleaching, dyeing, coloring, and printing cotton and woollen goods."[106] One incorporator was John Clark, who

The automated hydroelectric plant at the northern end of Centennial Island, just above the confluence of River Meadow Brook and the Concord River, was completed in 1990. The construction included a large amount of earthwork to create a "cove" (brown arrow) in the river for emptying Wamesit Canal water from the plant's tailrace. The Wamesit Canal serves only this small 650-kw power plant (red arrow) and no longer empties Concord River water into River Meadow Brook. The former Stirling Mills (purple arrow) and the brook may be seen. Part of one of the tailraces (blue arrow) of the Wamesit Canal remains, but the water in this race is backwash from the brook. A number of other factories associated with the Wamesit Canal remain. This includes the former U.S. Cartridge Company (yellow arrow), Stott's Belvidere Woolen Mill No. 2 (green arrow), and the American Bolt Company (white arrow).

served as the company's first treasurer. A second incorporator was Augustus H. Fiske, a lawyer in Boston. The most

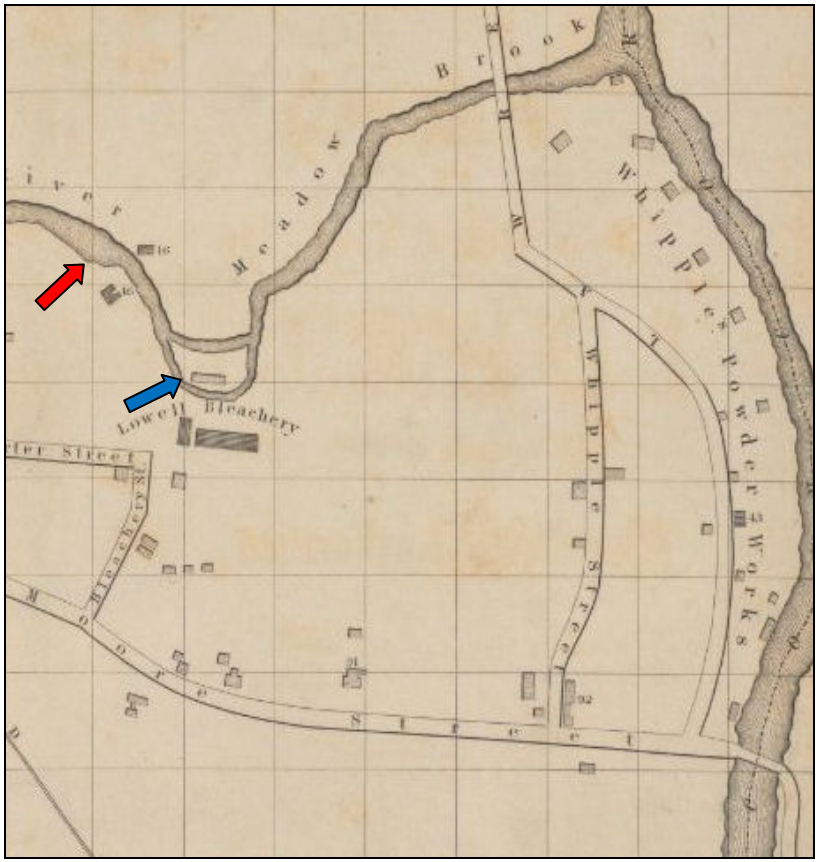
Lowell Plant," *Boston Globe*, May 10, 1988; "Finally the Concord Can Swirl in Peace," *Boston Globe*, April 15, 1990.

[105] The former Waterhead Mill, which is now partially occupied by Romalho's West End Gym, and the former Stirling Mills, now an apartment building, are the two surviving textile factories on Centennial Island. Part of the Waterhead Mill was destroyed in a serious fire in 1962. See "General Alarm Blaze Levels Lawrence Street Plants," *Lowell Sun*, May 29, 1962.

[106] *Laws of the Commonwealth Passed by the General Court*, (Boston: Dutton & Wentworth, 1833), pp. 494-95.

important figure, however, was Jonathan Derby, who, in 1824, had founded a bleachery at Savage, Maryland, near Baltimore, and had served as agent of this concern.[107]

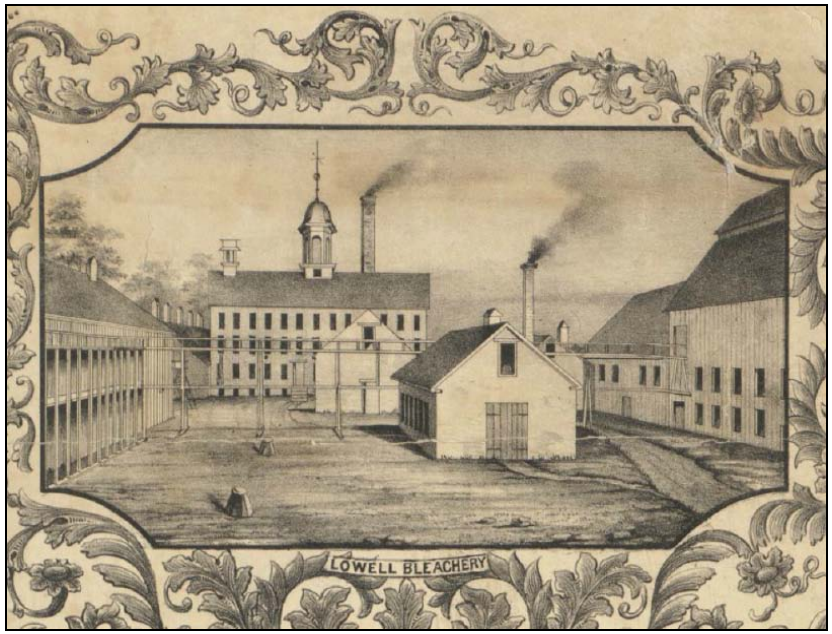
In 1832, Derby relocated to Lowell and began buying tracts of land between Oliver Whipple's powder works and canal along the Concord River and Hale's Mills. This property, which he purchased for the bleachery extended south from River Meadow Brook toward Moore Street. Whipple was one of the major landholders in this section of Lowell and he sold three acres of land along the brook to Derby for $1,500. After securing the property Derby then contracted with Moses Hazeltine, a local carpenter who, along with a crew of laborers, constructed three wood-frame factory buildings, the largest being a three-story structure. The cost of these first bleachery buildings was $3,500.[108] Unlike the other large textile mills in Lowell, the bleachery company at its inception did not



Detail from the Beard and Hoar map of Lowell, 1841, showing the Lowell Bleachery. This is the earliest known map of the bleachery. Note that a bleachery building (blue arrow) was constructed on the "island" within the brook. Just above the section of the brook that flows around this "island" is the mill pond (red arrow) formed by the lower dam on River Meadow Brook. This mill pond was associated with Moses Hale's clothier mill in the 1790s. Note too that Whipple's gunpowder works along the Concord River is shown, but Whipple's Canal was not drawn. (Source: Harvard University Map Collection.)

[107] Of the men who incorporated the Lowell Bleachery Fiske is found in the Boston directory (1831) and Derby in the Lowell directory (1832). It is far less clear which of the several John Clarks listed in these two city directories was the one associated with the bleachery incorporation. One possibility is John Clark who was superintendent of the Merrimack Mills in Lowell. Another possibility is a John Clark in Boston who was in banking and insurance. Clark served as the bleachery's treasurer for only one year. See *Laws of the Commonwealth Passed by the General Court*, pp. 494-95. Derby's connection to the bleachery in Savage, Maryland, is noted in "Bleachery," *Baltimore Patriot and Mercantile Advertiser*, July 19, 1824.

[108] The Whipple sale of land to Derby of the Bleachery is found in the Northern Middlesex Registry of Deeds, v. 14, pp. 373-374. For a description of the work performed by Hazeltine see "Moses Hazeltine with Jonathan Derby Agreem't," also in the Registry of Deeds, v. 10, pp. 514-517. This deed includes a list of all of the building materials and estimates of material costs.



This detail from an engraving of an 1850 map of Lowell is the earliest known image of the Lowell Bleachery. The main mill with a cupola is seen in the center. (Source: "Plan of the City of Lowell, Massachusetts," by Sidney & Neff, 1850, from the Levanthal Map Center, Boston Public Library.)

construct boarding houses for its workers or a house for its agent. Derby took up residence at Joshua Swan's house at Hale's Mills, boarding in rooms in Swan's Federal-style mansion.[109]

Initially the bleachery employed about 30 men and finished less than five million yards of cotton cloth each year. The bleaching of cloth for calico printing, which comprised the largest amount of cloth handled at the bleachery, entailed seven basic steps: (1) singing of the cloth's surface; (2) washing the cloth in a vat of tepid water; (3) immersing the cloth in a boiling lime solution for several hours; (4) treating the cloth with a bleaching (chlorine) solution; (5) washing the cloth with a weak (sulfuric) acid solution; (6) rinsing the cloth with clean water; (7) drying the cloth. A great deal of water was required for the bleaching process and the Lowell Bleachery used water from River Meadow Brook, as well as spring water drawn from wells on the company's property. The bleachery discharged wastes, including lime, chlorine, and sulfuric solutions, into the brook. This process remained largely unchanged throughout the life of the bleachery.[110]

Management of the bleachery changed considerably during its first three years of operation. After only two years as agent, Jonathan Derby died mysteriously in Mississippi, his lifeless body recovered from the Yazoo River a few days after he had drowned from a steamboat on which he was a passenger.[111] Joseph Hoyt succeeded Derby as agent and like his predecessor he boarded at Joshua Swan's mansion at Hale's Mills. Hoyt's background is not known, however, he served as agent for about one year before Charles T. Appleton replaced him. A

[109] See the Lowell city directory for 1834.

[110] For information on the bleaching process, including a description of cloth finishing at the Lowell Bleachery, see "The Art of Bleaching," in *Scientific American*, v. 5 (November 2, 1862), p, 282.

[111] The circumstances surrounding Derby's death may never be known. The steamboat captain, crew, and passengers reportedly attempted to save Derby from drowning, but to no avail. On his body was found a large sum of cash, a gold watch, and papers indicating that he was from Lowell. Derby was unmarried and his remains were buried in Mississippi. A brief notice of his death was published in the *Salem Gazette*, December 2, 1834.

distant cousin of Boston merchant Nathan Appleton, who figured prominently in the founding of Lowell's cotton textile industry, Charles Appleton, the son of Nathaniel Walker Appleton, was born in Baltimore, Maryland, in 1809 and remained there a few years before his family returned to Boston. In the mid 1820s he attended Phillips Exeter Academy after which he likely entered his family's merchant business in Boston. The young Appleton, however, had some mechanical skills and interests as evidenced an improvement in a dyeing apparatus for which he received a patent in 1854.[112] His initial experience in textiles was at the Waltham Bleachery and Dye Works, where he served as the company's agent before coming to Lowell in 1835. The Lowell Bleachery's board members appointed Appleton agent as well as treasurer.[113]

During Appleton's initial years directing the company the bleachery operations grew modestly but steadily. Powering the machinery was a 40-horsepower stationary steam engine installed in 1833.[114] (Waterpower from the Concord River would not be used at the bleachery until the 1850s.) By the late 1830s the bleachery employed fewer than 40 men and they churned out about 4.8 million yards of finished cloth each year.[115] Although the brick textile mills near the center of Lowell were significantly larger than the bleachery, these wood-frame structures along the brook were the largest buildings in this section of the city.

Charles Appleton remained in Lowell until 1846, but moved to Boston that year where he continued to serve as company treasurer. At this time, however, Appleton and the new resident agent, Charles A. Babcock, oversaw the first in a series of major expansions of the bleachery.[116] The company built a new bleach house, dry house, and finishing house. In addition, a new engine house with a more powerful 120-horsepower steam engine was completed in 1847. All of these new buildings were of brick construction. A fire in 1852 destroyed the bleachery's main building, which contained a cupola and bell, but this was quickly rebuilt with a new brick structure. Nearby, on Bleachery Street, the company built wood-frame boardinghouses in which resided some of the 20 women and

[112] U.S. Congress, "Report of the Commissioner of Patents, for the Year 1854, Arts and Manufacturers" Ex. Doc. 59, v.1, 32nd Congress, 2nd Session, (Washington, D.C.: 1855), p. 290.

[113] The Lowell Bleachery has received very little attention in published histories of Lowell or America's textile manufacturing history. Some information on the early years of the Bleachery is found in Duane Hamilton Hurd, *History of Middlesex County, Massachusetts*, v. 2, (Philadelphia: 1890), p. 79.

[114] This high pressure steam engine at the Bleachery and another at the Belvidere woolen mill on the lower Concord River were the two most powerful stationary steam engines in Lowell in the 1830s. For the bleachery, however, it soon limited the amount of cloth that could be finished and this engine was far smaller than steam engines at other bleacheries during this time period. For example a bleachery in Providence, Rhode Island, used a 200-horsepower steam engine at its works. See U.S. Congress, "Steam Engines: Letter of the Secretary of the Treasury," House Doc. 21, 24th Congress, 3rd Session, December 13, 1838.

[115] A short description of the Bleachery is found in the Lowell city directory for 1838.

[116] Born in Milton, Massachusetts, Babcock was 31 years old when he became agent of the Lowell Bleachery in 1846. He had previously worked as a clerk and paymaster at the Lowell Carpet Company. See Lowell city directory for 1845.

River. They planned to use the Wamesit Falls dam at the head of the Wamesit Canal to impound water, which would then flow through the canal and into the power plant. The plant was 250 men who worked at the bleachery. A large house on Moore Street, near the residence of Oliver Whipple, served as the agent's residence, where Babcock, his wife, and young family lived.[117]

This bleachery enlargement was accompanied by the hiring of a growing number of Irish-Catholic immigrants, some of whom settled in tenements, boardinghouses, and cottages in the surrounding neighborhoods near the brook. These immigrants, alongside a larger number of native-born New Englanders, often worked in the most arduous and dangerous jobs in the bleachery. Rarely a year passed without a serious injury to a bleachery worker. The most common life-threatening injuries included falling from the platforms around the dyeing and bleaching vats or from the elevated tracks in the drying house, or catching a limb or clothing in machines or shafting.[118] Prior to 1853 the workday was about 12 hours long, including a half-day on Saturdays. That year, however, the bleachery and other textile manufacturers in Lowell reduced the workday to 11 hours. Bleachery employees were paid once a month in cash wages.

This view looking north along Prince Avenue (originally named Bleachery Street) shows the company's boardinghouses that were erected in the late 1840s. (Source: Elizabeth Hengen, Lowell Neighborhoods Survey, 1981, Center for Lowell History.)

[117] The expansion of the bleachery undertaken by Charles Appleton is found in the *Boston Atlas*, September 24, 1846. The company built a house for agent and treasurer Appleton on Moore Street in the early 1840s. See the listing for Appleton in the Lowell city directory for 1842. One of the bleachery boardinghouses was operated by the Thorning family as noted in the Lowell city directory for 1851. This directory also lists the number of bleachery employees. By 1850 with the issue of additional stock the company's capitalization was increased to $210,000. This is noted in *Massachusetts State Record and Year Book of General Information, 1850*, (Boston: 1850), p. 282. A report on the bleachery fire in 1852 is found in the *Boston Atlas*, January 16, 1852.

[118] In 1851 and 1852, for example, there were three reported serious injuries to workers at the bleachery that resulted in two fatalities. In one case, Martin L. Puffer, a 22-year old laborer in the calendaring shop, caught his arm in one of the iron rollers. Although a doctor successfully amputated Puffer's mangled limb below his elbow, the despondent young man subsequently drowned himself in River Meadow Brook. See the brief reports on Puffer's injury, *Boston Daily Atlas*, March 6, 1851, and his suicide, *New Hampshire Patriot*, May 15, 1851.

Along with the nearby industries which were associated with Whipple's Canal, the bleachery and its environs continued to grow in the 1850s. The lower section of River Meadow Brook was increasingly reshaped by this industrial development and by the growing population in the vicinity of the stream. Oliver Whipple, who owned a vast amount of property around the bleachery, instructed his agent Ephraim B. Patch, to sell at a public auction, beginning in 1856, a large amount of this real estate. Over the next two years Patch sold dozens of properties although much of the residential development of these lots slowed with the economic depression that followed the Panic of 1857.

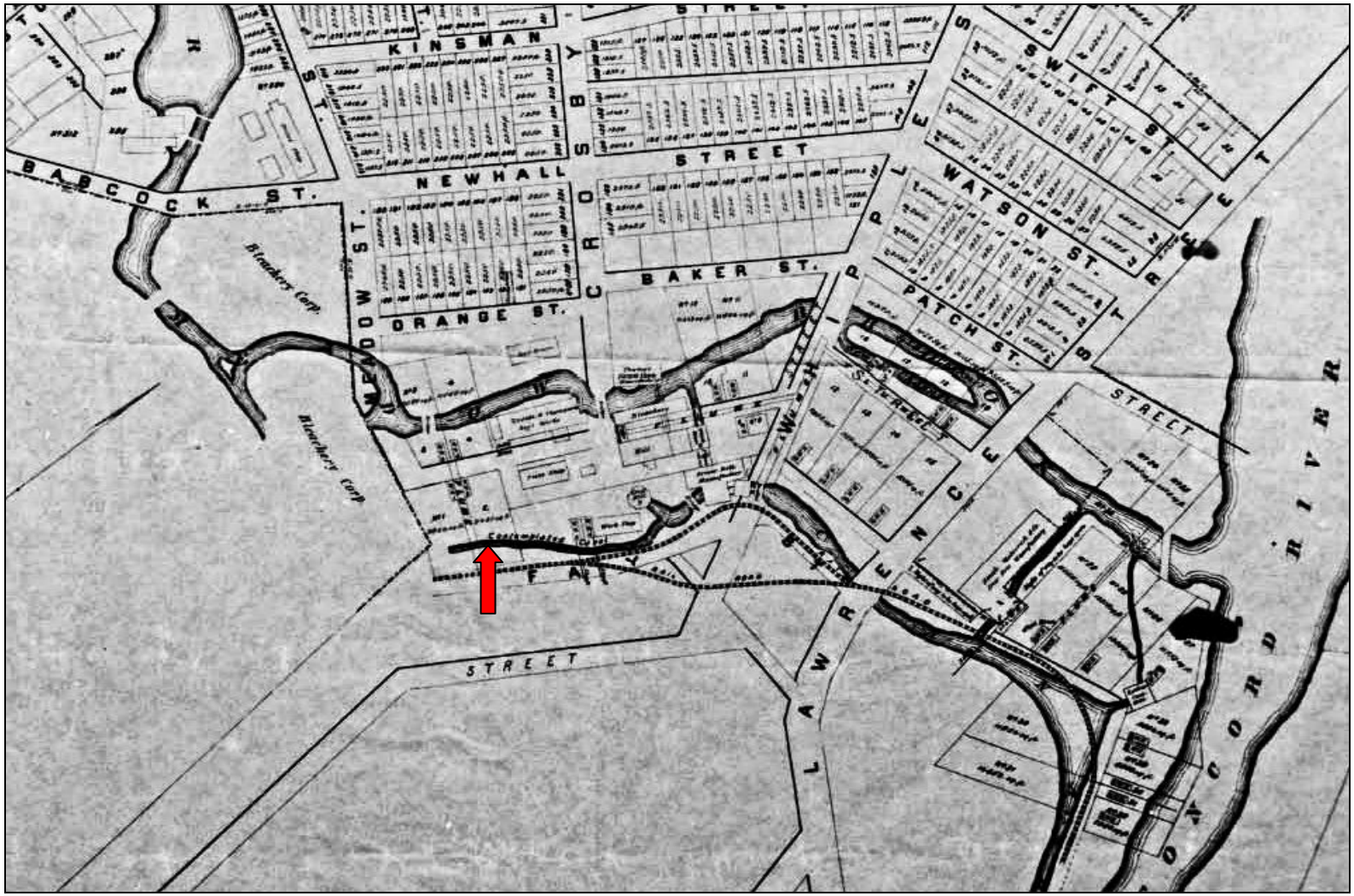
With Patch as Whipple's agent a number of the industrial buildings along the Whipple's canal were enlarged, several new ones were constructed, and new waterwheels were installed at two sites. This work coincided with a number of improvements to the canal, including the widening of sections of the waterway, the reconstruction of head and tail races that flowed into River Meadow Brook, and the extension of the canal to the Lowell Bleachery. This extension permitted the bleachery to use Concord River water not only to power a newly installed 75-horsepower turbine but to provide additional water for processing cloth.[119]

The bleachery agent in charge of these improvements in the mid-1850s into the 1860s was Francis (Frank) Parker Appleton, who was Charles Appleton's half brother. Born in Boston in 1822 and educated in private schools and at the city's English High School, Appleton had worked briefly in Lowell as clerk in the bleachery office before attending the Harvard Divinity School, from which he graduated in 1845. He was ordained and took up a Unitarian ministry in South Danvers where he gained a reputation as an outspoken abolitionist. For reasons unclear he left the church in 1853 and accepted the agent's position at the bleachery, replacing the recently departed Charles Babcock. Appleton would serve as agent for over 30 years, the longest tenure of any Lowell Bleachery agent.[120]

From the mid 1850s through the mid 1880s the bleachery was a consistently profitable company and new buildings, including a chemical plant for producing chlorine and acids, were constructed shortly after the Civil War. The bleachery processed 25,000 to 30,000 pounds of cloth each day by the late 1860s and 400 workers were employed in the various departments. The rising levels of production also resulted in greater amounts of chemicals, most notably chlorine, acid

[119] These improvements began in 1856 and extended over a seven-year period, although, under Patch's direction, much of the work appears to have been carried out in 1856-57 and in 1863. See "Whipple's Mills," *Lowell Daily Citizen & News*, May 8, 1856 and "Improvements," *Lowell Daily Citizen & News*, October 16, 1863. In a court case that involved the Wamesit Power Company and the Lowell & Andover Railroad in 1888, testimony revealed that the Bleachery used Concord River from the Wamesit Canal only for its initial washing process due to the poor quality of the river water. By the 1880s the Bleachery was using large quantities of city water from the municipal water supply, in addition to Concord River and spring water. See "The Wamesit Case," *Lowell Daily Courier*, January 4, 1888.

[120] Biographical information on Charles T. Appleton is found in *Biographical Sketches of Representative Citizens of the Commonwealth of Massachusetts*, (Boston: 1901), pp. 878-881.



The contemplated extension of Whipple's Canal (marked with red arrow) to the Lowell Bleachery is shown on this 1856 map "Plan of Land and Water Power at Lowell, Mass, Belonging to Oliver M. Whipple." None of the bleachery buildings are shown. (Source: American Textile History Museum.)

washes, and dyes dumped into the brook. During one particularly hot and dry summer and fall that occurred in 1883, when the Concord River had one of its lowest flow rates in its recorded history, hundreds of dead fish, mostly suckers and each weighing about a pound, were seen floating from Massic Falls to Church Street.[121]

From the 1860s into the 1880s, agent Frank Appleton and the Boston-based treasurer, Samuel G. Snelling, who had replaced Charles Appleton in 1859, were the principals directing the bleachery company during this time. In the mid-1880s a short-lived but severe downturn in the nation's textile industry struck Lowell and, in 1886, resulted in a financial crisis for the bleachery company.[122] The bleachery's financial distress, however, revealed a major scandal involving treasurer Snelling

This Lowell Bleachery & Dye Works label dates from the time when Frank Appleton served as the company's agent and Samuel Snelling was the treasurer. Despite the financial scandal that rocked the firm in 1886 and stemmed from Snelling's embezzlement of company funds, the bleachery was a highly profitable enterprise throughout much of the tenure of Snelling and Appleton. (Image courtesy of the American Textile History Museum.)

[121] In the 19th century the lowest recorded flow of the Concord River occurred in the summer and fall of 1881. At that time the Wamesit Power Company prohibited all of its users from drawing any surplus water into the mills. By contrast, during the dry season of 1883, Wamesit permitted only a 25 percent surplus amount of water to be used. This was more typical of the late summer and early fall restrictions. See "Low Water—Caution to Water Takers," *Lowell Daily Courier*, August 15, 1883.

[122] See the article on the post-Civil War expansion, "Bleachery," Lowell Daily Citizen & News, August 23, 1866. At its peak during this 30-year period the bleachery employed about 380 men and 20 women. The women were employed as cloth inspectors and in the packaging shop where the finished cloth was prepared for shipping to market. Men worked in all of the heavy laboring jobs in the bleaching and dyeing processes. The most comprehensive" history" of the Lowell Bleachery was published in an article titled "The Lowell Bleachery" that appeared in the Boston Globe, February 8, 1917. Unfortunately there are a number of errors in the information on the 19th-century period of the bleachery; the early 1900s information, however, is largely accurate.

who had embezzled as much as $400,000 of company funds, a stunningly massive amount of money for this time period. For the bleachery, the fallout from Snelling's crime lingered for months.[123] Although it was found that Frank Appleton had not been complicit in the fraudulent accounting practices of Snelling, he resigned as agent and was replaced by James N. Bourne, a nephew of John Kilburn, agent of the Lawrence Mills in Lowell.[124] Over the next several months Bourne laid off dozens of workers and fired a number of long-term employees, two of whom were overseers with more than 30 years of experience at the bleachery.[125]Within a year the bleachery resumed its pre-1886 production levels and was again employing about 400 workers. Over the next decade, however, very little capital was reinvested in new machinery or in the factory's aging buildings. In fact, two of the bleachery's operations were eliminated. One, a small cloth printing works, was discontinued in the early 1880s and never reopened.[126] More significantly, the dye works, which had been part of plant since its opening, was closed in the early 1890s.[127]

While few alterations were made to the bleachery's physical plant, by 1900 the surrounding neighborhood had undergone significant change. A grammar school, named after Benjamin F. Butler, was erected in 1883 to serve the growing number of

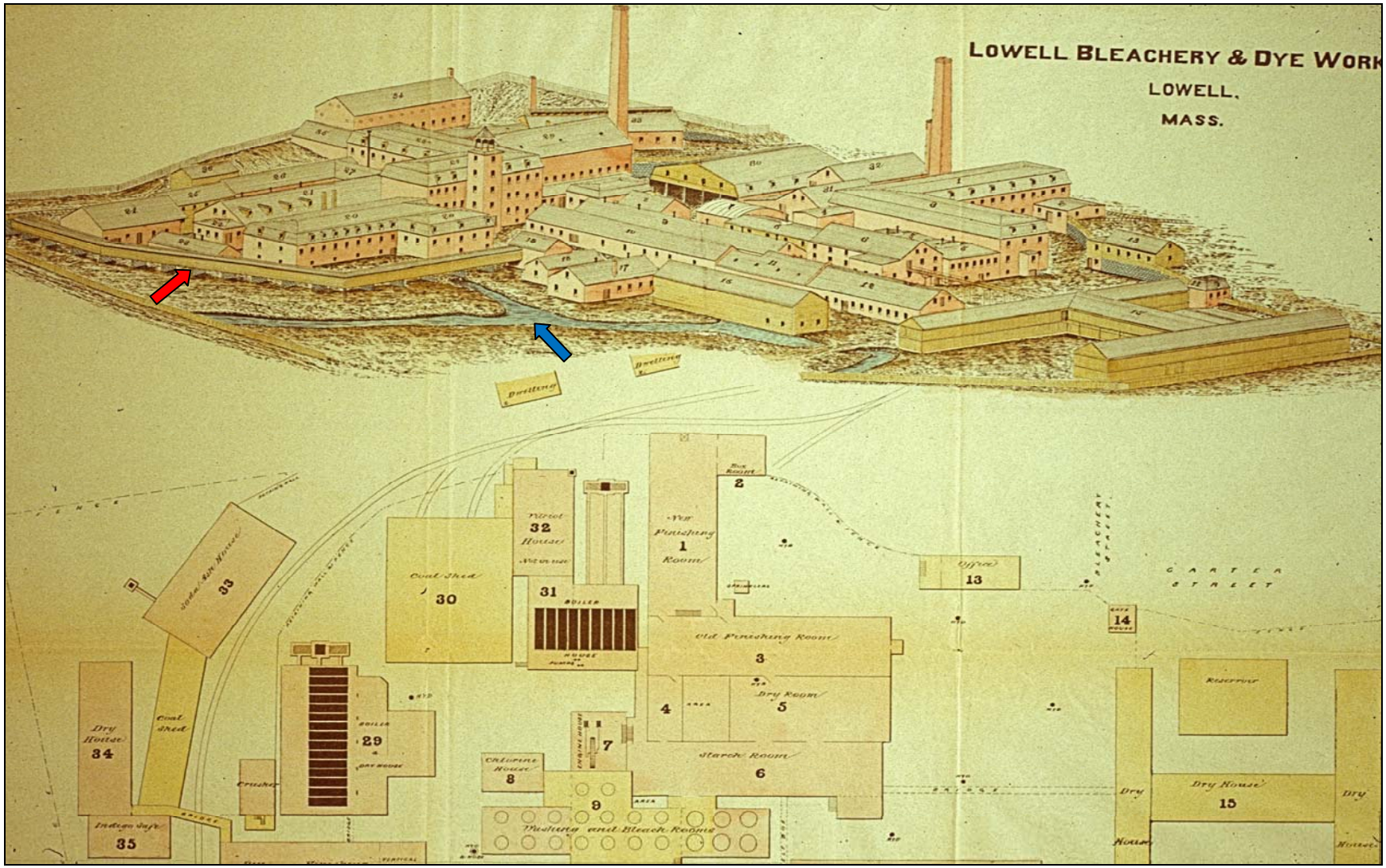
[123] At nearly the same time that Snelling's defalcation surfaced another Boston-based mill treasurer, William Gray, Jr., who had charge of the finances of three mills, including the Atlantic Cotton Mills in Lawrence, was discovered to have embezzled about $1 million. These two financial scandals were the most dramatic in the nation's textile industry in the 19th century and made headlines in all of the major periodicals of the time. See for example "Treasurer Snelling's Crime, Arrested in Boston," *New York Times*, August 20, 1886; "Treasurer Gray's Career," *New York Times*, August 18, 1886. Snelling was tried and convicted of embezzlement and perjury. He served the six years in a state prison and was released in 1892 at the age 67. See "Samuel G. Snelling out of Prison," *New York Times*, July 28, 1892. Snelling died in an affluent neighborhood in Dedham, Massachusetts, in1905.

[124] An internal investigation led by company president Augustus Lowell and his son Percival, who was appointed treasurer to succeed Snelling, found that no other bleachery officials were involved in Snelling's criminal activity. Undoubtedly Appleton, the former Unitarian minister, was deeply hurt by the actions of his close associate and superior, and his reputation at the bleachery was forever tarnished. See "The Lowell Bleachery," *Boston Daily Advertiser*, July 29, 1886; "Lowell Bleachery, Report of the Investigating Committee," *Lowell Daily Courier*, August 5, 1886.

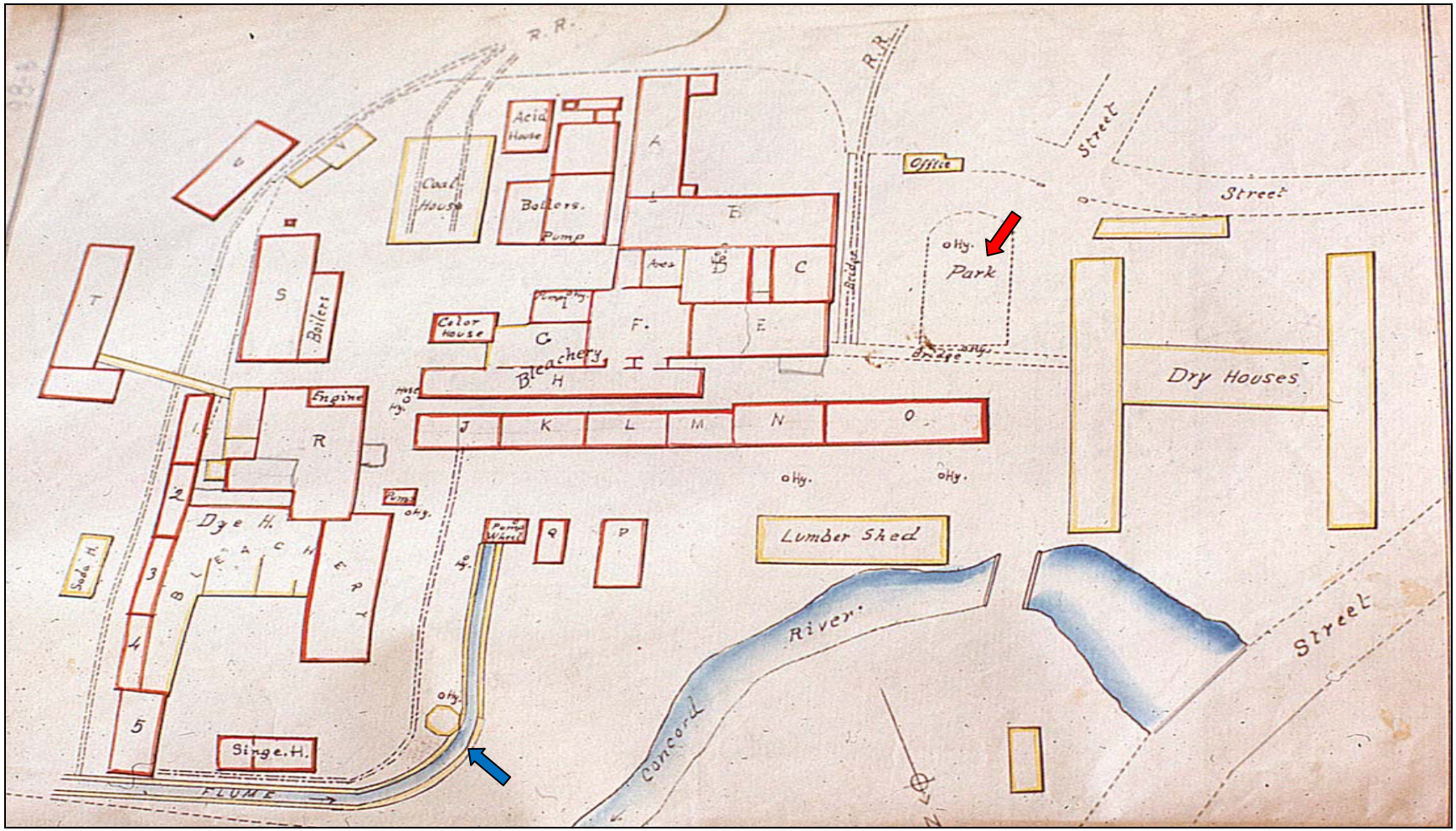
[125] Soon after Bourne took charge he ended a number of Appleton's managerial practices that he disdained including the use of the company's stables by overseers for their own private horses and carriages. The company's long-time selling agent Henry P. Perkins and paymaster Hamilton Burrage were permitted to keep their jobs. Bourne's actions were reported in "Changes at the Bleachery," *Lowell Weekly Sun*, October 2, 1886; "Old Employees of the Bleachery Discharged," *Lowell Daily Courier*, March 8, 1887.

[126] The printing works was on Chambers Street, on the north side of River Meadow Brook, across from the bleachery, and had formerly been operated by Joshua Mather. The bleachery company acquired it in the 1870s and sub-contracted its operation to Williams Parsons & Co., a small Lowell firm involved in the calico cloth printing industry. After a few years of printing dress calicos and shirtings, Parsons departed and Ormerod Duckworth, who lived in bleachery-owned house, ran the factory under the aegis of the Lowell Printing Company. A fire in 1882 destroyed part of the building and the bleachery ceased operations there. The print works was subsequently demolished. See "New Calico Print Works," *Lowell Daily Citizen & News*, March 12, 1877; "Destructive Fire at the Lowell Print Works," *Lowell Daily Courier*, December 16, 1882.

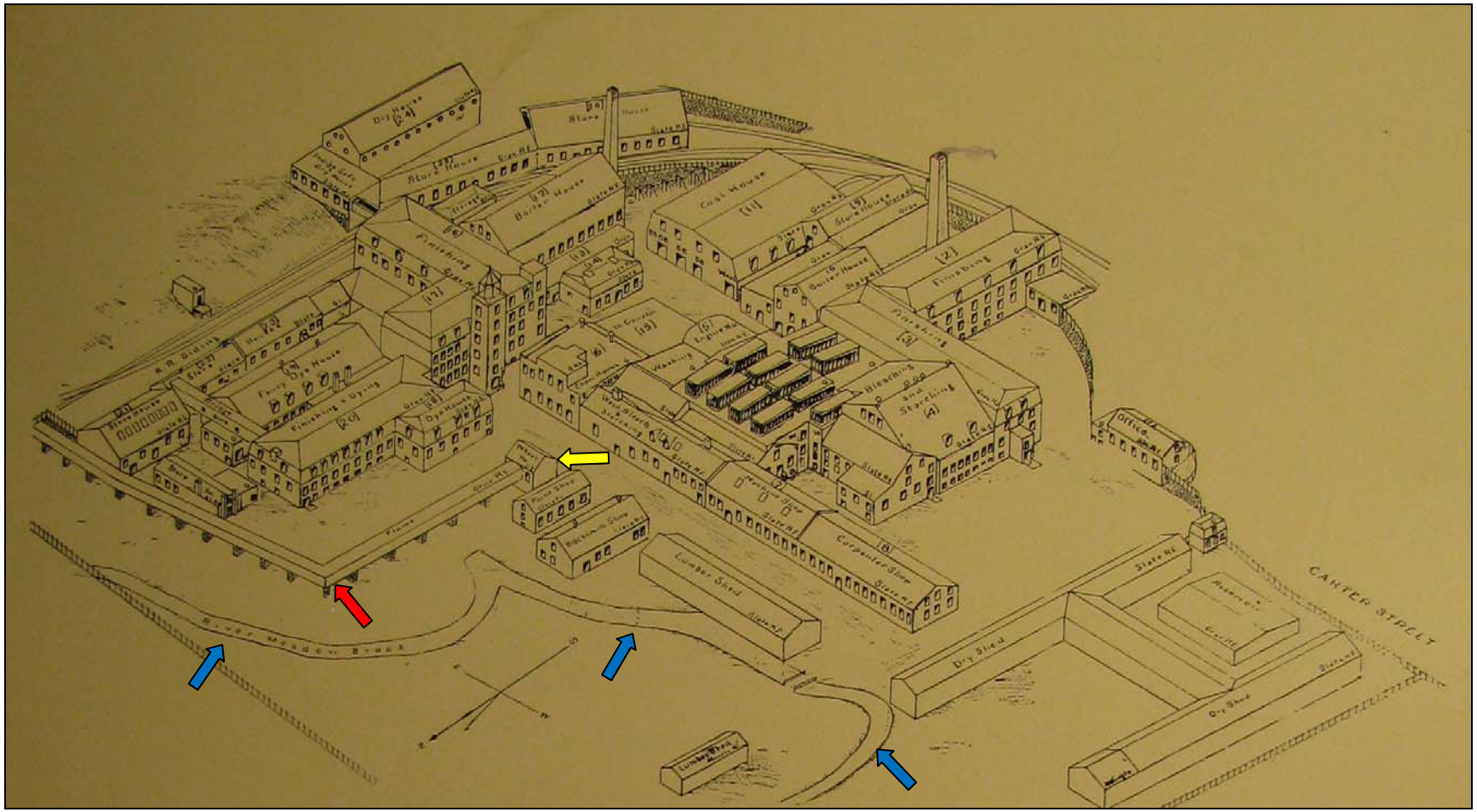
[127] "The Lowell Bleachery," *Boston Globe*, February 8, 1917. By the late 1890s the bleachery employment dropped to 250 men and just 12 women. These figures are noted in the Lowell city directory for 1898, p. 1063.



This bird's-eye view and partial plan of the Lowell Bleachery is from a ca. 1885 insurance map. The brook (blue arrow) is seen in the foreground as is the wooden flume (red arrow) that delivered Concord River water to the factory via the Wamesit Canal. (Source: Lowell National Historical Park.)



This plan of the Lowell Bleachery dates from the late 1880s. Note the "Park," which served as the mill courtyard, located between the dry houses (right) and the company office on Carter Street. A fire hydrant is also seen in this courtyard. River Meadow Brook is not labeled. Instead the brook's flow toward the Concord River is shown. The raised wooden flume (blue arrow) which curved as it conducted water from the Wamesit Canal to the "Pump House," and its 75-horsepower turbine, is also shown. (Source: Factory Mutual Insurance Map, courtesy of Dr. Patrick Malone, Brown University.)



This bird's-eye view of the Lowell Bleachery dates from 1893, although it was probably drawn in the late 1880s. By 1893, half of the drying sheds (lower right) were demolished and the dyeing operation was eliminated. Only the bleaching of cloth was carried out. Note the raised flume (red arrow) that conducted water from the Wamesit Canal into the small powerhouse (yellow arrow) which contained a 75-horsepower turbine. The depiction of the flume with its severe angled-turn toward the powerhouse is inaccurate. The flume curved as this point thereby reducing the turbulence as water flowed into the turbine. The tail race from this powerhouse is not shown, but water from the Concord River flowed into River Meadow Brook (blue arrows) after exiting the building that housed the turbine. (Source: *Lowell Today*, 1893.)

This multiple-family house on Crosby and Newhall streets, located on the north side of the brook, was constructed in the late 19th century when large numbers of Irish immigrants settled in this section of the city near the bleachery.

school children in Ward 3. Irish immigrants and their sons and daughters were the dominant ethnic group and a Catholic church, Sacred Heart, on Moore Street, opened in "Bleachery Parish," as one newspaper described it.[128] On the north side of River Meadow Brook, especially along Chambers, Pine Hill, Prospect, Kinsman, Crosby, and Newhall streets, dozens of two-family houses, small tenements, and cottages were built and more than half of the property owners were Irish Americans. This area, which was part of the so-called "workingman's ward" was, however, far less densely populated than Lowell's Acre neighborhood or Little Canada.[129] The bleachery's workforce also reflected this growing Irish presence and in the 1890s agent Bourne named John F. Monaghan, a popular figure and capable overseer, as superintendent.[130]

Around 1895 Bourne departed for a Rhode Island bleachery and company treasurer Eliot C. Clarke, who had replaced Percival Lowell five years earlier, named Frederick T. Walsh as agent. Although the South's cotton textile industry was increasingly competing with New England's mills and cutting into the profits of cotton manufacturing centers like Lowell, business at the bleachery remained stable. Nonetheless one of the bleachery company's board members, Edward Lovering, of

[128] The well-known Brooklyn architect Patrick Keely, who designed many Roman Catholic churches in the United States, served as architect for the Church of the Sacred Heart. The name "Bleachery Parish" was used by the *Lowell Sun* newspaper to describe the neighborhood in which the church was built in 1884. See "A New Catholic Church," Lowell Weekly Sun, February 23, 1884.

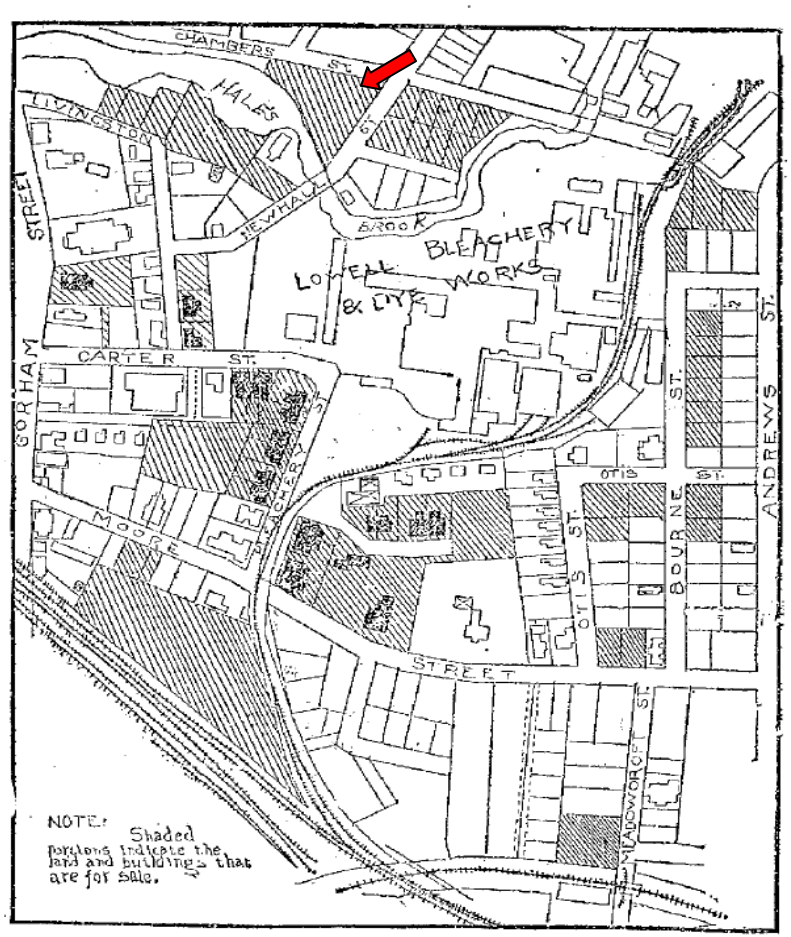
[129] The "Workingman's Club" members in Ward 3 tended to support Democratic candidates but the institution remained non-partisan, pro-labor reform throughout its existence in the late 1860s and 1870s. See, for example, "The Workingman's Club—A Noisy Meeting, *Lowell Daily Citizen*, September 11, 1877.

[130] Monaghan's popularity was noted in a number of newspaper articles on local politics in Ward 3. See, for example, "Politics," *Lowell Sun*, September 23, 1893' and "To Be Sidetracked," *Lowell Sun*, November 17, 1893.

Taunton, Massachusetts, who was also a major investor, was becoming disenchanted with the bleachery's management.

In 1900 Lovering orchestrated a major shake up at the bleachery that would profoundly shape its final three decades of its operation. The treasurer Eliot and agent Walsh resigned, and most of the managers, including superintendent Monaghan were dismissed. Four years later, in 1904, Lovering and the board appointed Sidney E. Coolidge, a Harvard graduate and an extremely capable and shrewd businessman, treasurer of the company.[131] It was Coolidge who led the bleachery through the last series of major expansions that thoroughly modernized the plant and machinery before it closed in 1930.

In the 1910s Coolidge and the bleachery's board of directors made two critical decisions in the wake of the Southern textile



This map, published in the *Lowell Sun* in 1899, advertised real estate owned by the bleachery that the company sought to sell. The shaded areas are the bleachery properties, a number of which were subdivided for residential construction on Bourne and Otis streets. Note the lands held by the bleachery along Hale's Brook. The red arrow marks the site of the Chambers Street print works (Source: *Lowell Sun*, May 6, 1899.)

[131]Lovering was dismayed at the financial condition of the bleachery upon learning that there was nearly $200,000 in outstanding notes and the stock was greatly over-valued in relation to the company's assets. The board agreed with Lovering to retire $300,000 of stock, that is, three out of every four shares, and issue new stock amounting to $100,000. This financial rearrangement occurred in the fall of 1900, soon after the board named Phillip Stockton, the son of Howard Stockton, treasurer of the Merrimack Mills, as company treasurer. It appears that Stockton was the man responsible for the resignations and firings of senior management at the Lowell Bleachery. This shake up is reported in the trade journal *Fibre and Fabric*, v. 32, September 15, 1900, p. 56. Lovering was responsible for securing the services of Sidney Coolidge who was treasurer of the Stark Mills in Manchester, New Hampshire, when he accepted the bleachery position. For details on the financial changes see "The Lowell Bleachery," *Boston Globe*, February 8, 1917. This article has some inaccuracies including the year that the major changes occurred, and the year that Coolidge was appointed treasurer.

industry's dominance of the coarse cotton cloth market. Because bleached coarse cloth was the major product of the Lowell Bleachery, and because the geographically distant Southern mills were now supplying 80 percent of all the cloth to the bleachery, Coolidge began looking for other bleachery sites. At the same time he oversaw the expansion of the physical plant in Lowell. In 1911, the Lowell Bleachery opened a branch plant in St. Louis while the company's agent, Charles E. Meader, oversaw the demolition and construction of new buildings in Lowell. A new steam powerhouse, a new bleachery building and storehouses were constructed of brick. Expansion continued in 1917 with the completion of a new finishing plant. The 20-acre site now contained some 350,000 square feet of floor space, the bleachery employed some 650 workers, and these workers finished as much as 150 million yards of cloth each year.[132]

Although the company did not resume its dyeing operation until the early 1920s, a study of pollution in River Meadow Brook in Lowell, conducted by the Massachusetts Department of Public Health during a period of intensive production at the bleachery, found that the largest amount of dumping of industrial wastes into the stream was from the Lowell Bleachery Not surprisingly this investigation revealed that chlorine levels in the brook were three times higher below the bleachery than in any other location that was tested. The study noted that "the waste liquors from bleaching 400,000 pounds of cotton cloth per week … gave the stream a noticeable color, but no objectionable odor was found in this neighborhood." It concluded that these "objectionable pollutions … can easily be removed by the construction of proper sewage facilities designed to receive both the sewage of operatives in these mills and those manufacturing wastes which are most seriously objectionable in their effect upon the stream."[133] Such a sewer system, however, was never constructed during the remaining years of the bleachery's operation.

For several years, beginning in 1914, as business at the bleachery boomed, the company realized consistently solid profits with shareholders receiving dividends of eight percent each year. Lowell continued to produce more than the St. Louis plant, although this began to change by the 1920s. Most importantly, the Lowell Bleachery Company entered into an agreement with the Georgia-based Kincaid Manufacturing Company, a major Southern producer of cotton toweling, and erected a bleaching plant at Experiment, Georgia in 1921.[134] Much of the bleaching machinery was fabricated in Lowell in the bleachery's machine shop, under the supervision of the shop's superintendent and Lowell Textile Institute graduate

[132] "Build New Mill," *Lowell Sun*, September 25, 1913; The Lowell Bleachery," *Boston Globe*, February 8, 1917

[133] Massachusetts State Department of Health, "Special Report of the State Department of Health Relative to the Condition of Hale or River Meadow Brook in the City of Lowell," *Second Annual Report of the State Department of Health of Massachusetts*, (Boston: 1917), pp. 332-337.

[134] "The Lowell Bleachery," *Boston Globe*, February 8, 1917; on the establishment of the plant in Georgia see "Lowell Bleachery," *American Cotton and Wool Reporter*," v. 26, (April 27, 1922), p. 985, and "Large Bleachery to be Erected," *Manufacturer's Record*, v. 81, (April 27, 1922), p. 66. The Kincaid Company operated mills in the neighboring town of Griffin, Georgia.

Birger Petterson, and then shipped by rail to the Experiment bleachery. Undoubtedly the men in this machine shop were aware that they were fabricating machinery which would supplant Lowell's bleaching of toweling from Southern mills.[135]

Despite the removal of the toweling department from Lowell, the company rebuilt and expanded the out-dated and infrequently operated dye plant along Bleachery Street. In addition, the company constructed a large concrete tank for storing and filtering Concord River water, from the Wamesit Canal, which was used for washing cloth, as well as in the bleaching and dyeing processes.[136] These improvements represented an investment of nearly $100,000 in the Lowell plant and throughout most of the 1920s production levels and employment remained stable, while bleaching and dyeing of cotton cloth continued to be profitable. The company promoted a number of "welfare" programs, supported various social and recreational programs, as well as sports teams for its employees, and even established a bleachery credit union. The company had traded some of its land to the city for a park and playground on Chambers Street and it maintained relatively good relations with the municipal government.[137]

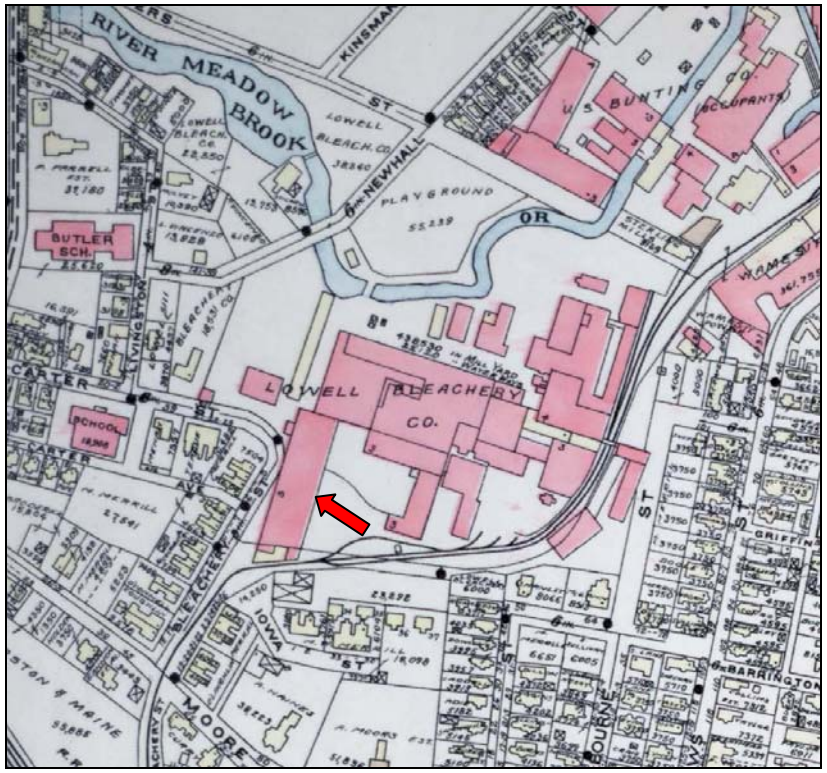
In the fall of 1924, however, the Lowell Bleachery and its properties in St. Louis, Lowell, and Georgia were merged into a newly established Boston-based firm the National Fabric and Finishing Company.[138] Coolidge served as president of this large company until 1927. He had also served as treasurer of the Lowell Bleachery South plant from its founding until 1926. That year the firm Georgia-Kincaid purchased the property. In the meantime bleaching and dyeing formerly done in Lowell were increasingly shifted to the St. Louis plant. Finally, although the city made an effort to retain the bleachery, National Fabric and Finishing announced in the summer of

[135] The fabrication of bleachery machinery for the Experiment plant is noted in "Bleachery to Expand," Lowell Sun, October 23, 1923. Birger Petterson who oversaw the fabrication and installation of the bleaching machinery was born in Sweden in 1875 and immigrated to the United States in 1895. Initially he worked as a cabinet maker and carpenter. A few years after graduating from the Lowell Textile School he became a master mechanic at the Bleachery and then superintendent of the mechanical department. Interestingly, after the Lowell Bleachery closed Petterson ceased working in the textile industry and became a poultry farmer in Chelmsford. He died in 1950. For information on the Experiment, Georgia, plant see "Large Bleachery to be Erected," *Manufacturer's Record*, v. 81, (April 27, 1922), p. 66. Information on Petterson is found in Lowell city directories, 1896, 1910, 1917 & 1921 and the Chelmsford city directory, 1940. Also see his obituary in the *Lowell Sun*, September 25, 1950.

[136] For information on this expansion, which would prove to be the last major investment of the bleachery company in its Lowell plant see "Lowell Bleachery Prepares to Spend More Than $100,000 in Local Plant Expansion" *Lowell Sun*, March 21, 1923

[137] The Chambers Street park began as a contentious battle between the city council, the Bleachery Company, and another landholder. The City of Lowell had seized some Bleachery land without notifying company treasurer Coolidge or agent Howard Whitely. Through the company's attorney, Frederic A. Fisher, Coolidge negotiated a land swap with the city. See "City Council," *Lowell Sun*, February 27, 1917. For the formation of the credit union see "Duly Establishment Credit Union at Lowell Bleachery," *Lowell Sun*, March 1, 1924.

[138] This merger included bleachery companies in Boston, Philadelphia, and Cincinnati, in addition to Lowell. See "Cotton Converters' Merger," *Wall Street Journal*, October 4, 1924.



The Lowell Bleachery is seen in this detail from the 1924 atlas of Lowell. Many of these buildings were demolished prior to the relocation of Prince Macaroni to this site in 1939. The dye plant (red arrow) was one of the few buildings retained. (Source: Center for Lowell History.)

1930 that it was closing the Lowell plant due to a lack of orders from mills in the declining textile region of New England.[139]

[139] "Buys Lowell Bleachery," *Lowell Sun*, October 28, 1926; "Bleachery Will Leave," *Lowell Sun*, August 30, 1930.

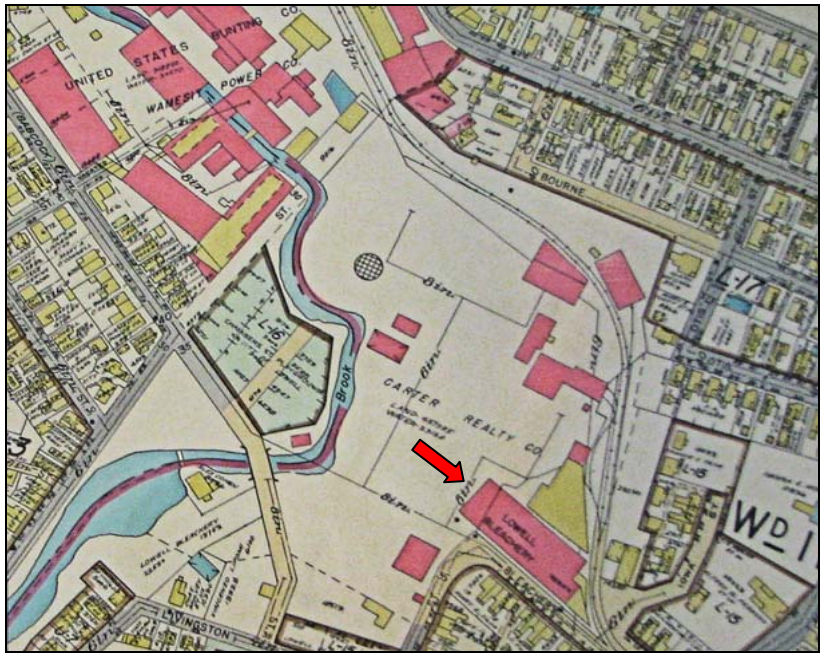
Prince Macaroni Manufacturing Company

Most of the abandoned bleachery buildings along Bleachery and Carter Streets, and extending down to River Meadow Brook, were of brick construction and were in relatively good condition, many having been erected in the 20th century. A local concern, the Lowell Realty Company, purchased most of the property. With the exception of the office building on Carter Street and the three-story brick building along Bleachery Street, which served as the dyeing plant and was completed in 1923, all of the bleachery buildings were torn down. After nearly a decade a buyer appeared in 1939 when a group of city politicians, boosters, and businessmen convinced the Prince Macaroni Manufacturing Company, owned by Gaetano LaMarca, to move into the site.[140] Even before the company relocated from Boston to Lowell, the city council changed the name of Bleachery Street to Prince Avenue, in accordance with the wishes of the pasta-maker.[141]

Prince Macaroni installed pasta-making machinery and other equipment in the former dye works building in the summer of 1939 and by September the company employed about 75 women and men. Employment would grow to about 200

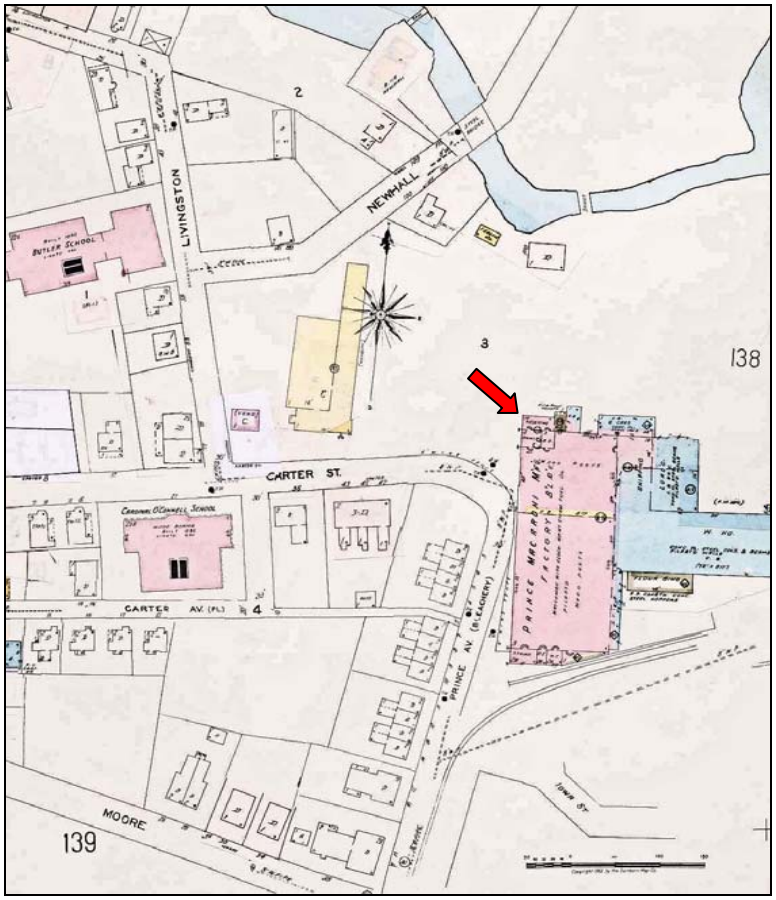
[140] The group of businessmen included Ames Stevens, who was agent of the Wamesit Power Company and had a vested interest in getting a manufacturer to locate at the bleachery site. The power company leased water to the various industries along the canal and relied on these water-supply contracts to generate revenue. For the actions of this group to entice Prince Macaroni to relocate to Lowell see "Macaroni Firm Moves Here," *Lowell Sun*, March 23, 1939.

[141] This name change was reported in the *Lowell Sun*, April 20, 1939.



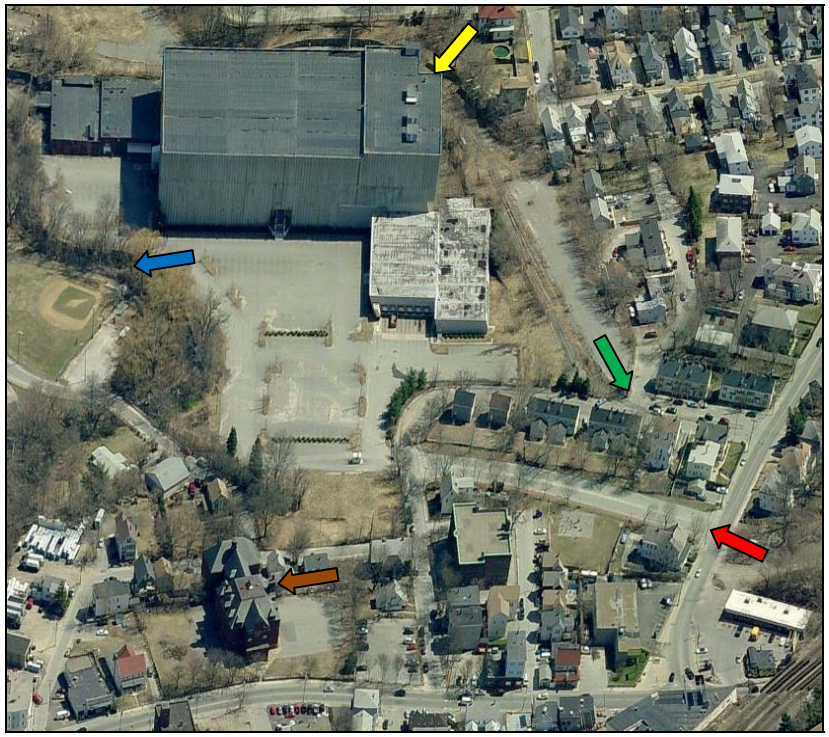
This detail from a Lowell atlas published in 1936 shows the extent to which buildings of the bleachery were demolished a few years after it closed. The Carter Realty Company of Lowell owned the property prior to its acquisition by the Prince Macaroni Manufacturing Company in 1939. Prince Macaroni initially occupied the brick building (red arrow) along Bleachery Street, subsequently renamed Prince Avenue. This building, constructed in 1921, served as the dye plant and was one of the last additions to the bleachery before it closed in 1930. (Source: Center for Lowell History.)

workers over the next several months.[142] There is no evidence that Prince Macaroni used water from the Wamesit Power



This detail from a 1952 Lowell atlas shows the old dye plant (red arrow) from the bleachery that Prince Macaroni converted into a pasta-making factory and used until 1978 when the company erected the large reinforced concrete and steel structure that stands today. (Source: Center for Lowell History.)

[142] See "New Lowell Industry Starts Sept. 15, Will Employ 200," *Lowell Sun*, August 9, 1939. Soon after opening the plant, the city held a banquet at the Blue Moon restaurant in honor of Prince company officials. "Honor Officials at New Plant," *Lowell Sun*, September 27, 1939.



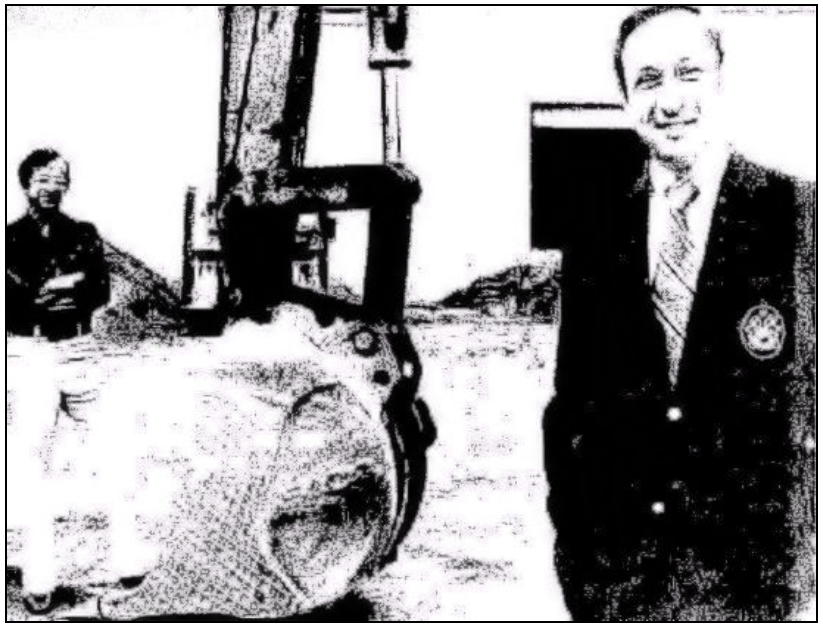
This aerial view of the Prince Macaroni plant shows the massive five-story pasta-making factory (yellow arrow), completed in 1978, and the controversial access road (red arrow), off Moore Street, that was built at about the same time as the new factory. The former boardinghouses connected to the Lowell Bleachery are located along Prince Avenue (green arrow) and the Butler School (brown arrow) on Gorham Street is seen in the lower left. River Meadow Brook (blue arrow) flows along the north side of the former Prince Pasta property.

Company and thus with the end of the bleachery and the elimination of dumping chorine, dyes, and other chemicals into the stream, the water quality of River Meadow Brook in the area just above Lawrence Street undoubtedly improved.

Prince Macaroni occupied the bleachery site for nearly 50 years. Led by Giuseppe (Joseph) Pellegrino, who joined the company in 1941 and soon after acquired a controlling interest in the firm, the company expanded its operations in Lowell and became New England's leading pasta maker. Pellegrino oversaw the construction of number of buildings on the 20 acre site, including a paper box-making plant, a printing plant, warehouses, and utility buildings. By the mid 1960s Prince sales amounted to $25 million and the company had added a new plant in Illinois for its growing Midwestern market.[143]

In Lowell, company president Pellegrino embarked on an ambitious beautification program in the area of Lowell that became known as "Spaghettiville." In the late 1950s he hired a Swiss-born gardener, Walter Wilhelm, to oversee the company's landscape work. In addition to the plantings in and around the Prince factory property, Wilhelm designed and built a very popular terraced flower garden and waterfall at the Prince Grotto, an Italian restaurant on Newhall Street that was operated by the pasta company. Wilhelm also designed the stone wall and ornate iron gate that stood at the entrance to the

[143] Pellegrino established a number of subsidiary companies that operated within the Lowell factory. For example, the Cleghorn Folding Box Company operated the paper box-making plant and its printing plant handled the color printing for the pasta boxes. In addition to warehouses, the company operated a machine shop for repairing the pasta-making equipment. See "Prince Macaroni Sales Top $25 Million in '64," *Lowell Sun*, April 11, 1965.



Joseph Pellegrino, Sr., and his son, Joseph, Jr., pose at the construction site of the new pasta factory in Lowell. (Source: *Lowell Sun*, August 23, 1977.)

Prince Grotto. Pellegrino subsequently received one of Lady Bird Johnson's beautification awards in honor of his company's tree and garden-planting efforts.[144]

A reminder of the Prince Macaroni plant that occupied the old bleachery property for nearly 50 years is seen in the "Welcome to Spaghettiville" sign on the railroad overpass spanning Gorham Street.

By the 1970s Prince's clever marketing campaigns, its acquisitions and expansions in the pasta-making industry, and its improvements in manufacturing techniques and equipment contributed to its rapidly growing sales in the United States and Canada.[145] Although he considered moving the Lowell factory to New Hampshire, Pellegrino decided to construct a 300,000-

[144] Sadly, a spate of vandalism in the early 1970s, including the removal of the head of a human figure from a marble sculpture imported from Italy, led Pellegrino to the install fences and walls around the company property. Pellegrino also erected a 10-foot tall fence on either side of the Newhall Street Bridge that crossed River Meadow Brook to keep vandals from destroying property and throwing debris into the stream from the bridge. See "Colorful Gardens Beautify South Lowell," *Lowell Sun*, November 2, 1971. The beautification award is reported in "Local Industrialist Honored by Mrs. LBJ," *Lowell Sun*, June 12, 1966.

[145] Prince pasta sales topped $100 million by the mid 1970s. For a good description of the Lowell operation in the early 1970s see "Prince Macaroni Sales Top $35 Million," *Lowell Sun*, November 10, 1971. A feature on Pellegrino and his company in the mid 1970s is found in "People Have Made His Business," *Lowell Sun*, August 23, 1976.

This sign of the Hale's Brook Community Beautification, Inc., is on a metal tree-guard surrounding a tree near the corner of Carter Street and the access road dates from the late 1970s tree plantings.

square foot plant on the old bleachery site along River Meadow Brook in 1977. When completed, the $5 million plant was the largest pasta-making factory in the United States and Prince employed about 500 workers in Lowell.[146]

Although many in the city welcomed the addition of the new Prince factory, Pellegrino clashed with a number of city council members and neighborhood residents over his demand for a publicly funded access road into the Prince Avenue plant. A rail line that dated from the 19th century and was originally

The access road leading to the plant, to which many in the neighborhood objected when Joseph Pellegrino demanded its construction in 1977. As part of the agreement between the city and Prince Pasta, Pellegrino provided funds for beautification projects and tree plantings which were carried out by the non-profit organization Hale's Brook Community Beautification, Inc.

used by the bleachery ran along Prince Avenue and into the Prince factory, but the company relied primarily on trucks for its transport of raw materials and finished products. Residents near the plant contended with the existing heavy truck traffic and many believed that the new access road, which would extend near a school and would require the demolition of a handful of homes, would result in even more noisy and hazardous traffic. Despite a bitter fight in the city council,

[146] "Lowell Picked Over New Hampshire for $5M Prince Expansion," *Lowell Sun*, August 23, 1977.

Pellegrino's demand was met and the new road was completed in the late 1970s.[147]

Pellegrino and his son, Joseph, Jr., continued the family-owned business until 1987 when they sold the company to Borden, Inc., one of Prince's competitors in the pasta-making industry.[148] Although with this acquisition Borden garnered nearly one-third of the nation's pasta sales, the company struggled in the early 1990s. In 1995 the New York City based Kohlberg Kravis Roberts & Company (KKR), a leverage buyout firm, purchased the giant food company. KKR quickly began selling off Borden's assets, until its main business was pasta-making. Borden operated five major pasta plants in the United States and one in Canada, but by 1997, under pressure from KKR, the company began consolidating its pasta production into its larger manufacturing facilities. Borden officials decided to close the Lowell plant and, despite the efforts of Boston-area interests to purchase the property, the company, perhaps fearing competition in an already highly competitive market, dismantled the factory.[149]

Dutton Yarns, led by local businessman Elkin B. MacCallum, acquired the abandoned plant and operated it in conjunction with his Joan Fabrics Corporation, manufacturers of

Swiss-born gardener Walter Wilhelm designed the ornate iron and masonry fence that encircles part of the former Prince Pasta plant and the demolished Prince Grotto restaurant. This section of the gate is located around the plant's large employee parking lot off Prince Avenue.

automobile and furniture upholstery. When MacCallum sold Joan Fabrics to Collins & Aikman, a Michigan-based textile company in 2001, he closed the Dutton Yarns facility. The largely abandoned property is currently held by a MacCallum-owned company named 38 Prince Avenue LLC.

River Meadow Brook flows around the now silent bleachery site, the landscape of which is dominated by the hulking concrete factory building, constructed in the late 1970s, and a large, empty asphalt parking lot that extends down to the

[147] "Prince Road Plan OK'ed on 5-4 Council Vote," *Lowell Sun*, November 30, 1977.

[148] "Borden Buys Prince for about $164M," *Boston Globe*, June 2, 1987.

[149] The best source on Prince Macaroni, especially in relation to the Borden acquisition, this company's subsequent closing of the plant, and the efforts of its unionized employees to contest Borden's actions is Francine Corbin, "Prince Pasta Unravels in Spaghettiville, 1939-1997," (unpublished master's thesis, University of Massachusetts, Lowell, 2001).

stream. Nothing remains from the Lowell Bleachery. The once ornate, terraced gardens and fountains associated with the Prince Grotto restaurant were removed in the late 1990s. But the masonry wall and iron gate along Newhall Street survives. It is the sole reminder of this formerly popular locale in the Bleachery District.

This view along Prince Avenue, former Bleachery Street, show the surviving boardinghouses that the Lowell Bleachery Company constructed for its workers in the late 1840s.

As seen from Newhall Street near River Meadow Brook, this brick, masonry, and iron gate, which was designed by Walter Wilhelm, extends across a driveway that once led to the highly popular Prince Grotto Restaurant. The restaurant opened in 1959, closed in the late 1990s, and was demolished shortly thereafter. The ornate gate is the only reminder of Wilhelm's work associated with the Prince Grotto and dates from the early 1970s.

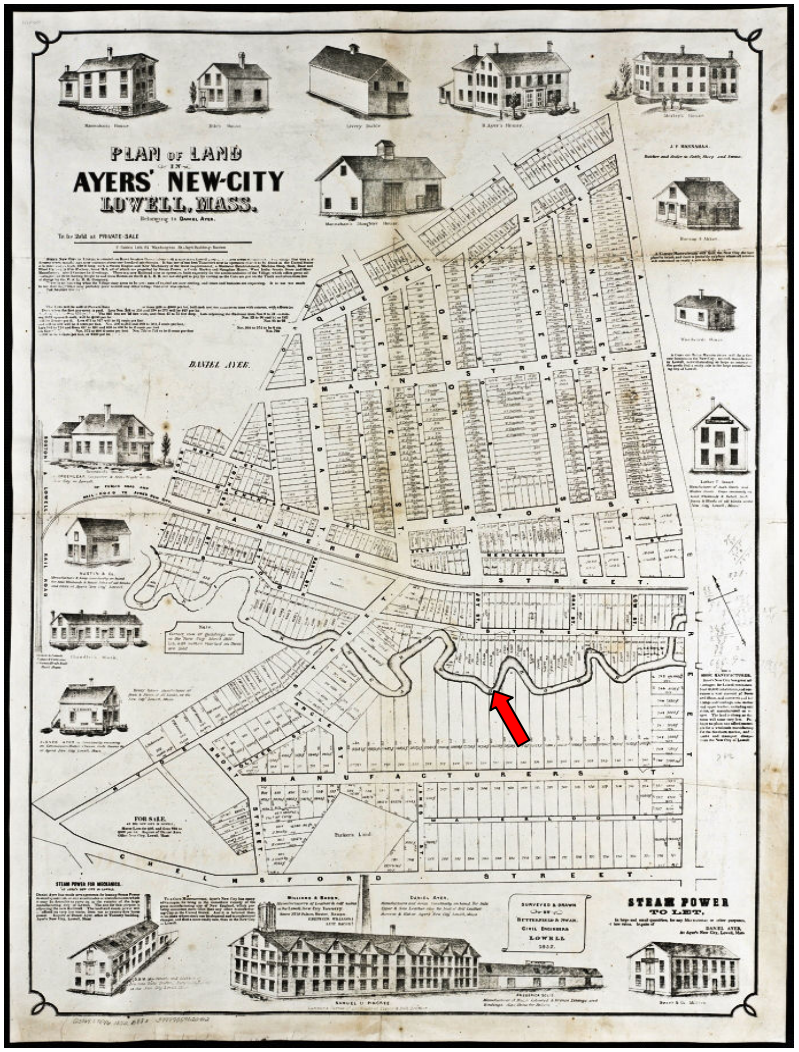
Part IV: Ayer's City and City Farm District

This part of River Meadow Brook ranges from the Chelmsford line, where the brook crosses into Lowell, and extends along the Lowell Connector to the junction of Tanner and Howard streets, where the latter road is carried over the stream by a small bridge. As will be discussed, over this approximately one-and-three-quarter mile section, the most dramatic changes to the brook were carried out over a 110-year period, beginning in the early 1850s and culminating in the alteration of the course of the stream in the early 1960s with the construction of the Lowell Connector.

Until the early 1850s, the area that became known as Ayer's City was largely farm land. Along River Meadow Brook the cultivated meadows included hay fields, pasture lands, vegetable gardens, and fruit orchards. Marshy bogs and thickets also extended along the serpentine course of the slow-flowing brook, covering the area's low-lying lands. A few farm houses and barns, owned by well-established Chelmsford families, including the Coburns, the Butterfields, the Marshalls, the Moors, the Davis', and the Osgoods, dotted the landscape. With the exception of the Boston & Lowell Railroad line, which skirted the northern and eastern limits of this section of Lowell, little had changed along the brook from the late colonial era into the early 1850s.

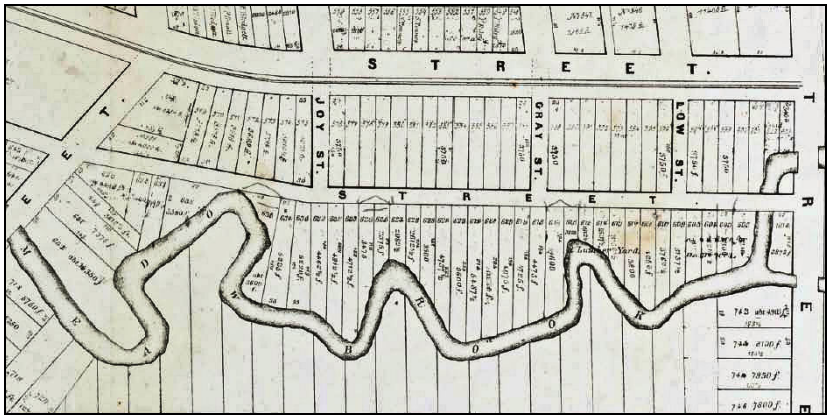
Daniel Ayer and Ayer's New City

The first significant transformation of the landscape in this area, however, began in 1850 when real estate speculator



Plan of Ayer's New City, 1852, which included industrial and residential development. A winding River Meadow Brook is seen in the lower third of the plan. (Source: Levanthal Map Center, Boston Public Library.)

Daniel Ayer acquired land and platted the development he immodestly called "Ayer's New City." Born about 1815 in Canada near the Vermont border, Daniel Ayer first appeared in Lowell in the mid 1830s and initially worked as an operative in the Hamilton Mills. By 1839, Ayer owned a dry goods store on Merrimack Street and he married a young woman from Dracut.[150] Two years later, however, Ayer was insolvent and his estate was assigned to Joseph Butterfield, a deputy sheriff and member of a long-standing Chelmsford family.[151] Over the next six years Ayer, with the help of his wife and with the sale of property that was in her name, climbed out of debt and became a wealthy real estate dealer. By 1848 he had amassed over $20,000 and famously held a banquet at his School Street residence, inviting all of his former creditors and paying each the amount he owed them plus interest. This act was not only reported in numerous newspapers, but it solidified Ayer's standing in Lowell's business and banking community.[152]



This detail from Ayer's plan of his "New City" shows part of the serpentine River Meadow Brook. Note that instead of attempting the expensive work of straightening sections of the brook, Ayer simply platted the lots and laid out the streets to conform to the meandering stream. (Source: Levanthal Map Center, Boston Public Library.)

In the late 1840s Ayer embarked on his two most ambitious projects in Lowell, beginning with a residential development on Christian Hill. In 1850 he initiated a far costlier venture, the creation of his "New City" in the sparsely populated southern section of Lowell. Ayer began acquiring numerous parcels of land along either side of River Meadow Brook, many of which he purchased from the Butterfield family. At once, Ayer had his lands surveyed, subdivided, and platted. While continuing this land acquisition, he oversaw the construction of a tannery and several small manufacturing buildings, along with the establishment of a cattle market, all of which he personally financed. Ayer also convinced officials of the Boston & Lowell

[150] The earliest biographical piece on Daniel Ayer appeared in a Lowell newspaper that reported on his first (and only) year as a representative in the Massachusetts legislature. This article noted that he was born in Canada in 1815 and reported that Ayer "is quite an operator in real estate and always gets a large company to attend his sales." See the *Lowell Daily Journal & Courier*, May 5, 1854. In the federal census of Lowell for 1850, however, Ayer's birthplace is recorded as Vermont. Ayer first appears in Lowell's city directories in 1837. A short obituary of Ayer is found in the *[Lowell] Saturday Vox Populi*, January 12, 1884.

[151] A notice of Ayer's insolvency and his assignee, Joseph Butterfield, appeared in the *Lowell Courier*, November 2, 1841.

[152] "Anomaly, Almost," *Lowell Daily Advertiser*, May 29, 1849. The story of Ayer's banquet and his hosting of all his creditors appeared in newspapers throughout Massachusetts and in other states. See, for example, "An Honest Man and Excellent Wife," *The [Schenectady, NY] Cabinet*, June 12, 1849.

Railroad to build a spur line along the brook to the tannery and cattle market, pointing out that rail traffic to these new enterprises would be highly profitable. Ayer named the road Tanner Street on which the rail line was built. By late summer of 1851 he began his campaign to sell the many dozens of empty lots to the public.

To bolster attendance and interest potential buyers in his land sales, Ayer orchestrated festive celebrations that often involved bull roasts, music, and speeches. At one such event held outdoors at the New City, Ayer spoke at length about himself, his aspirations for Lowell, and the important role his new development would play in diversifying the city's manufacturing interests. He portrayed himself as a humble, working man who had little formal education and had struggled financially. Ayer then attested to his unshakeable faith in the prosperity that would grace all residents and property holders who invested in the New City. He boasted of the recently completed railroad spur and called attention to the first industrial works and houses that had just been built. Ayer contrasted these new developments with the landscape that had existed only months before. "Gentlemen," he intoned, "you see this railroad, yonder convenient cattle market, this splendid Tannery, Machine Shop, Cabinet Factory, Sash and Window Blind Manufactory, just springing up, and upon yonder plain some half dozen houses, on all of which land the forest trees grew some four months ago." Ayer continued, "The brook was high and the meadow was low; some told me that I would never see the day that the [rail]road would be made across yonder meadow and brook; that they did not believe the child was yet born that would see the railroad running along by the side of the brook."[153] For Ayer, reshaping the land meant not only profit, but social progress.

AUCTION SALES.

BY DANIEL AYER.

OFFICE IN LOWELL, AYER'S NEW CITY—IN BOSTON, No. 76 STATE STREET.

GREAT SALE OF REAL ESTATE IN MASSSACHUSETTS, NEW YORK AND NEW JERSEY.

The subscriber takes this opportunity to inform the public that he is now fully prepared to attend to buying and selling Real Estate on commission, and hopes by attending promptly to the business entrusted to his care, having never attempted to sell Real Estate without accomplishing the same, he is hopes, by putting his undivided attention to the business, when the prices are reasonable, and the title perfect, to make sales that will satisfy both buyer and seller. He will soon have ready for the market, at private sale, in Lowell, Boston, New York, Williamsburg, Brookline, and vicinity, Houses, Stores, and Wharves—small and large Farms—City and Village Lots—and will attend to surveying, planning and superintending the sales at auction, or otherwise, near the cities of Boston, New York, &c, of large or small parcels of Real Estate, for small villages, wharves, manufacturing purposes, &c, on commission.

Daniel Ayer ran numerous newspaper ads promoting his many real estate ventures. (Source: *Boston Daily Atlas*, March 18, 1853.)

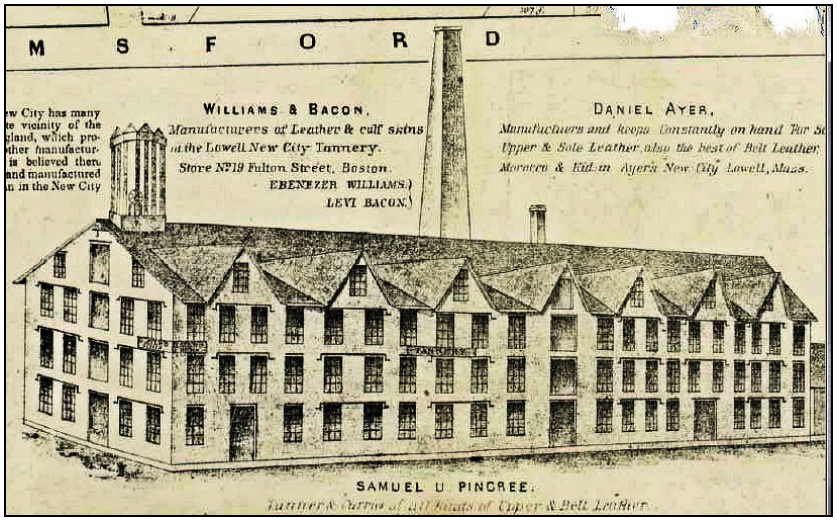
The Early Tanneries

Although Ayer touted that the New City would be home to many diverse manufacturing enterprises and would rectify the problem of Lowell's dependence on one industry, textiles, he had difficulty attracting other industrial interests. For the first

[153] "Speech of Daniel Ayer, Esq.," *Boston Daily Atlas*, October 1, 1851.

two decades the tanneries, clustered around Tanner and Lincoln streets, formed the principal industry. Of the three early tanners in the New City, which included Samuel W. Pingree, Fred Solis, and Williams & Bacon, the Boston-based firm of Ebenezer Williams and Levi Bacon was the largest, employing about 100 men, many of whom were Irish immigrants. These tanneries produced leather goods mostly for the apparel trade especially for manufacturers of gloves and shoes.[154]

By the late 1850s, Ayer's New City was simply called Ayer's City, although its founder had departed Lowell in 1857 while suffering again from personal financial turmoil.[155] Ayer had sold all of the lots, as well as the large tannery and other



This drawing depicts the main tannery in Ayer's New City, which was a large wood-frame building located on Tanner Street at the intersection of Lincoln Street (called Hide Street in the initial plat map of the New City). All of the early industrial buildings, including the machine and woodworking shops and leather-making establishments were built of wood. This district suffered a number of fires that damaged or destroyed these buildings. The main tannery was destroyed by fire in July, 1864. (Source: Levanthal Map Center, Boston Public Library.)

industrial buildings that he constructed, but the venture was not very profitable. In fact, with the exception of the tanneries, a grocery, and a small woodworking shop, and about a dozen residences, which were erected largely between 1851 and 1855, there was little new development into the 1860s.

Along the brook, there remained numerous marshy areas and swamp lands. This soggy, undeveloped landscape occasionally received scornful and even humorous mention in the local press. In one instance a reporter hustling to cover the story of a

[154] Fred Solis was the only Lowell-based tannery proprietor. Pingree, who would patent a process for applying tanning liquor to hides, operated a tannery in Methuen, Massachusetts, and retained his works in the New City for about one year. Levi Bacon, from Woburn, Massachusetts, subsequently moved to Lowell to oversee tannery operations. For the number of employees at Williams & Bacon see "Great Sale of Real Estate in Ayer's New City," *Boston Daily Atlas*, March 18, 1854. The ethnic background of employees at this tannery is based on names found in Lowell city directories for 1852 and 1853. These city directories also listed the major leather goods produced by the Lowell tanneries. None in the "New City" manufactured leather for belting used in factories. The most prominent Lowell producer of heavy leather belting was Josiah Gates whose factory was located in Mechanics Block on Dutton Street.

[155] Ayer found himself in debt again in 1856, but was able to pay his creditors. See "The Man Who Paid His Debts, Twice," *Boston Daily Atlas*, April 21, 1856. Ayer's wife died in 1857 and she left him with two young daughters. See the obituary of Annette B. Ayer in the *Lowell Daily Citizen & News*, June 22, 1857. Ayer departed Lowell, settled in North Greenbush, New York, and remarried. He remained in the Albany, New York, area until his death in 1884.

dwelling on fire leapt over a fence near the brook "and came near being lost," as the newspaper editor wrote, "in one of the bog holes which abound in that famous city."[156] Those who resided elsewhere in Lowell, including elected officials, considered Ayer's City a remote location and the little development that had taken place, as well as the small population living in that locale, did not warrant any significant municipal services. No paid policemen patrolled Ayer's City. In addition, the fire department established an engine house on Tanner Street in 1858, but only after a group of citizens petitioned the city council, following a fire that destroyed one of the neighborhood's few dwellings.[157] The complaint of inadequate city services among Ayer's City residents would continue for decades.

For nearly thirty years after the founding of Ayer's City, tanning remained the primary industry in this section of Lowell. At various times, as many as three tanneries operated on Tanner Street, near Lincoln Street and one of the most prominent of the early tanners in Lowell was Levi Bacon. Born in Billerica in 1810, Bacon spent a number of years as a tanner in Woburn, Massachusetts, before moving to Lowell in 1851 when he took charge of the largest tannery in Ayer's City. The three-story factory, located on the west side of Tanner Street, measured 35 feet by 150 feet and was built of heavy timber columns, wood floors, and wood siding. Although the partners in the company that operated this tannery changed a number of times, Bacon remained a principal in the firm. He and two partners, Ebenezer Williams of Boston and Charles G. Lund of Woburn, purchased the property from Daniel Ayer in 1854.[158] Williams was a wealthy merchant and leather dealer who, through marriage, was connected to two prominent merchant and boot and shoe manufacturing families, the Tirrells of Weymouth, Massachusetts, and Moses T. Durrell, of Boston. Together they provided capital for the acquisition of the Lowell tannery, which produced patent and enameled leather, and the goods made in Lowell were sold through Williams' selling house in Boston.[159]

A second tannery, built in 1857 and consisting of a two-story wood-frame structure, measuring 35 feet by 150 feet, stood on the across Tanner Street from Ayer's original factory. It was operated by a group of local men, who formed the firm of Barnard, Bacon & Cutler. Levi Bacon's son, Francis L. Bacon, was one the partners, along with Gilbert Barnard, of Andover, Massachusetts, and Sylvester P. Cutler of Lowell. Of the three

[156] At the outbreak of the Civil War Camp Chase was established in south Lowell near Ayer's City. The camp was a training ground for new recruits in the Union Army. The newspaper editor who noted the travails of the young reporter mired in the swamp, also wrote, "If the federal army was encamped in the morasses of that city, Jeff Davis could never capture them." Quote from "Fire Last Night," *Lowell Daily Citizen & News*, June 22, 1861.

[157] Unlike fireman at other engine houses in Lowell who were paid a nominal fee for their services, those in Ayer's City received no compensation. See "Municipal" *Lowell Daily Citizen & News*, June 23, 1858.

[158] "Great Sale of Real Estate in Ayer's New City," *Boston Daily Atlas*, March 18, 1854.

[159] Information on the Tirrell family and the various marriages of the daughters of the patriarch, James Tirrell, to tanners and leather merchants is found in William Richard Cutter, *Genealogical and Personal Memoirs Relating to the Families of the State of Massachusetts*, (New York: 1910), p. 428.


WILLIAMS, BACON & LUND,
MANUFACTURERS OF
PATENT & ENAMELLED,
POLISHED & SMOOTH GRAIN
Calf Skins & Split Leather,
AYER'S NEW CITY.
EBENE'R WILLIAMS, LEVI BACON, CHAS. G. LUND.
Store in Boston, No. 19 Fulton Street.
CASH PAID FOR SLAUGHTER HIDES, AT THE STORE, AND LOWELL TANNERY.

This advertisement for the tannery of Williams, Bacon & Lund appeared in the Lowell city directory for 1853. By this time Levi Bacon was the resident manager in Lowell. (Source: Center for Lowell History.)

partners in this firm, Cutler had the most experience in the tanning industry and he superintended the factory, while living at the opposite end of Tanner Street, off Howard Street. Like the neighboring tannery of Williams, Bacon & Lund, Cutler's works produced patent and enameled leather, primarily for the boot and shoe industry. In each case, the two firms were constantly reorganizing and partners were frequently changing throughout the late 1850s and early 1860s. This was, no doubt, a result of the severe economic depression in 1857-58 and then the outbreak of the Civil War.[160]

During most of the Civil War tanneries in Ayer's City operated only sporadically and the surrounding blocks remained largely undeveloped. In addition to the tannery buildings, only about 30 to 40 dwellings had been erected and a number of these were occupied by families of Irish immigrants. In early 1864, however, Abel E. Bridge & Company, a newly established leather-manufacturing company organized in Boston began operations in the tannery formerly run by Cutler. The Vermont-

[160] Cutler's firm changed partners almost every year it was in business in Lowell. By 1859 the tannery operated as Viall, Cutler & Co., with John Viall a commission dealer in shoes and leather goods, and a resident of Medford, Massachusetts, replacing Francis Bacon as partner. In addition, local tanner Ira Clough joined the firm. After Viall withdrew, John G. Gove and his brother, Henry G. Gove, leather merchants in Boston, assumed a major role in the company that, by 1861, was called Gove, Cutler & Co. This firm, however, did not stay in business very long and it abandoned its Lowell tannery. On the other hand, the Williams & Bacon tannery was somewhat longer lived. Between 1857 and 1861, Levi Bacon's company underwent a number of reorganizations, the first occurring when Charles Lund departed and the firm was renamed Bacon & Williams. By 1859, Moses T. Durrell had joined the firm, along with James L. Bates of Weymouth, Massachusetts. Bates, like Durrell had married a daughter of the wealthy Weymouth leather merchant James Tirrell. The new firm was called Durrell, Bacon & Co. Levi Bacon remained a partner until 1862. That year Bacon, at age 52, apparently ended his involvement with the business and traveled with one of his daughters to Portland, Oregon. While sailing home on the S.S. Golden Gate, Bacon met a horrible death when the steam and sailing ship caught fire and sank off the coast of California, killing over half of the 338 passengers and crew. See "Death of a Lowell Man," *Lowell Daily Citizen & News*, August 19, 1862.

born Abel Bridge lived in Charlestown, Massachusetts, and owned a successful hide and leather selling house in Boston. He was joined by Elbridge G. Cook, a wealthy tanner who resided on a farmstead in Milford, Massachusetts. Both men were in their fifties when they acquired the Lowell tannery and they began operations in the late winter of 1864, employing about 45 workers. Some of the workers lived in two wood-frame tenements, located next to the tannery, which the company acquired along with the factory property. George W. Eaton, a Lowell resident and experienced currier who was in his late forties, superintended the factory.

That summer, while Moses T. Durrell, who had assumed control of the Williams & Bacon Company, was making improvements to his tannery across the street from Bridge & Co., the bark mill attached to Durrell's factory caught fire. By the time the fire department arrived, flames had wholly consumed Durrell's tannery and the conflagration had spread, across Tanner Street to the wood-frame building of Bridge and Cook, which was the original tannery of Daniel Ayer. Both factories were completely destroyed.[161] This was the first of a number of disastrous fires that struck industries in Ayer's City.

Moses Durrell decided not to rebuild and, after considering a move to Somerville, Bridge sold out his partnership to Elbridge Cook who assumed sole control of the firm and decided to construct a new and larger mill of brick at the same site on Tanner Street. The three-story factory, which became known as Cook's Tannery or, simply, the Lowell Tannery, measured 60 feet by 200 feet with an L, also of brick, 40 feet by 35 feet. The tannery also included a bark mill and outbuildings for storing hides. When it reopened Cook's Tannery employed about 60 men, the majority of whom were Irish immigrants or of Irish parentage. At the time that Cook rebuilt his factory, there were two other tanneries in Lowell. This included Hubbard & Blake, which relocated to Tanner and Manchester streets; and the leather glove manufacturing establishment of William H. White and Dwight L. Dimock, which was located off East Merrimack Street near the Concord River.[162]

After completing the reconstruction of his tannery, Elbridge Cook sold the property to one William H. Andrews of Smithfield, Rhode Island, and then leased the factory from Andrews. Cook continued to reside on his Milford farm, but he employed his oldest son, Orville W. Cook, at the Lowell Tannery to help manage its operations.[163] On the first floor,

[161] Although no lives were lost, this fire in Ayer's City was one of the worst to that date in Lowell. A third smaller tannery on the southwest corner of Tanner and Lincoln streets and operated by Hubbard & Blake was also damaged by the fire. See "Destructive Fire," *Lowell Daily Citizen & News*, July 18, 1864; and "Destructive Conflagration," *Lowell Daily Courier*, July 18, 1864. Durrell's losses amount to $75,000 and he was insured for about half that amount. See "The Late Fire at Ayer's City," *Lowell Daily Courier*, July 23, 1864. For a report on the fire that describes the lack of growth in Ayer's City and the lack of activity in the tanneries between 1861 and 1863 see "Great Fire in Lowell, *New York Post*, July 19, 1864.

[162] "Ayer's City," *Lowell Daily Citizen & News*, May 28, 1867. Cook rebuilt the tannery soon after the fire in 1864. See Lowell city directory for 1864-65 & 1866.

[163] Andrews was a wealthy cattle dealer who had a farm in Smithfield, Rhode Island. It is not known if he was a silent partner in Cook's Tannery, but in June, 1867, he purchased all of the tannery property, as well as a number of other parcels of land in Ayer's City, formerly held by Bridge and Cook. Andrews paid Cook $50,000 for these properties. See Northern

workers prepared hides for tanning by removing hair and flesh using a combination of soaking in a caustic solution and scraping. The hides were then tanned in vats located on another part of the first floor. Once tanned, hides were then conveyed to the third floor where they were "stuffed," that is, workers applied oils to the leather to soften it. The leather was then carried to the second floor where it was finished or "waxed."[164] Raw animal hides were delivered to the tanneries by rail on the spur line along Tanner Street. The railroad also shipped the finished leather sides to Boston where the tannery goods were sold.

Tannery work was hot and dirty, and required a great deal of physical exertion and stamina. Tanning liquors, caustic chemical solutions, and animal refuse contributed to the noxious odors of the tannery district and the fouling of River Meadow Brook into which effluents from the tanneries were liberally dumped. As result, the area around the tannery was one of the least desirable residential addresses in Lowell. These conditions likely contributed to the growing reputation of Ayer's City, especially along Tanner Street and the brook, as a rough-and-tumble, desolate place.

Throughout the 1870s, only a handful of new buildings were constructed in Ayer's City. The economic depression following the Panic of 1873 forestalled further development.[165] Despite this limited growth, however, property owners, residents, and industrialists in this section of Lowell witnessed a significant alteration to the landscape, namely the construction of two railroad lines in the vicinity of River Meadow Brook. In the short term, a number of landholders in Ayer's City profited handsomely, selling the railroad companies parcels of real estate for the two roads. In the long run these railroads fundamentally reshaped the area's appearance, as well as its social and economic geography. Within a generation, warehouses, coal and small grain elevators, and additional heavy industries were established. All relied on rail transport. Moreover, an extensive network of railroad buildings and rail sidings were constructed that effectively cut off Ayer's City

Middlesex Registry of Deeds, v. 57, pp. 360-365; as well as the federal census for Smithfield, Rhode Island, 1870, and the city directory for Woonsocket, Rhode Island, 1869.

[164] A brief but revealing description of Cook's Tannery from this time period is found in the *Boston Daily Advertiser*, June 25, 1868. This article notes that most of the raw hides purchased by Cook came from the Southern states and from South America. One of the best sources on the tanning process in the 19th century is J. D. Fontenelle and F. Malepeyre, *The Arts of Tanning, Currying, and Leather Dressing, … with Numerous Emendations and Additions by Campbell Morfit*, (Philadelphia: 1852).

[165] One vexing problem that may have contributed to this lack of development was the poor quality of the original land surveys of Ayer's City and the resulting erroneous deeds held by various property owners. Legal disputes over clear title to the land occurred periodically in the 1870s and 1880s, the most prominent case involving Edwin Lamson and E. A. Thissell, owners of a factory on the southwest corner of Tanner and Lincoln streets who charged that William H. Andrews had built tannery-related structures on property that they had obtained from John F. Manahan. See "Mixed Titles," *Saturday Vox Populi*, August 24, 1889. This problem continued into the 1890s, as one Ayer's City resident conveyed to a newspaper reporter that "a clear title cannot be given to considerable land lying between here [Main Street] and Hale's Brook." See "Ayer [sic] City," *Lowell Morning Times*, August 19, 1890.

from the lands extending to the Concord River, as well as wagon roads and thoroughfares that would have linked this neighborhood to Lowell's downtown.[166]

Railroad Expansion

The first major rail line that cut directly through Ayer's City was the Framingham & Lowell Railroad, which was completed in 1871 and renamed the Lowell & Framingham Railroad 10 years later following a reorganization of the company. The 26-mile road extended from Lowell's downtown (the line shared the Boston & Lowell rail depot) to South Framingham. Construction began in June, 1870, and the first locomotive ran the entire route in August, 1871, with the final spike driven in a ceremony in Lowell.[167] The railroad sliced through the southern section of Lowell, diverging from the Boston & Lowell route near St. Hyacinth Street and extending through Ayer's City about one block east of Main Street. All of the street crossings were at grade level, which saved dramatically on construction expense, but increased the danger to residents and those travelling through the southern part of Lowell. The Lowell & Framingham crossed River Meadow Brook by the city's poor farm and then ran southwest to Chelmsford Center. From there it ran south to Acton through Westford and Carlisle, and onto Framingham via Concord and Sudbury.[168]

The second railroad to bisect Ayer's City was the Lowell & Andover line. Unlike the Framingham & Lowell, the Lowell & Andover was spearheaded by a group of Lowell businessmen who were also the major investors in the enterprise.[169] This rail project received a great deal of popular support in the city due largely to a long-standing disenchantment over the monopolistic practices and exorbitant freight charges of the Boston & Lowell Railroad, which controlled all of the rail traffic from Lowell into Boston. Led by Lowell lawyer Jacob Rogers, the wealthy Frederick Ayer, and Gustavus Fox, agent of the Middlesex woolen mill, the Lowell & Andover was

[166] Land sales in Ayer's City boomed at times during the decade of the 1870s. While some property owners sold outright to the railroads, others sued the rail companies, claiming that their land had been illegally taken. See, for example, the case involving John Manahan, one of the largest landholders in Ayer's City, as reported in the *Lowell Daily Citizen & News*, May 14, 1875.

[167] The Framingham & Lowell Railroad also built a freight station off Howard Street, near the intersection with Tanner Street. For reports on the celebration of the opening of the road see "The New Railroad," *Lowell Daily Citizen & News*, August 19, 1871.

[168] At the center of the debate over the state charter of the Framingham & Lowell Railroad were the two rival interests, one led by industrialist George Draper of Hopedale, Massachusetts, and the other by E. P. Carpenter of Foxboro. The majority of Lowellians supported the "Carpenter route" because Carpenter's proposal called for the line to extend into the Spindle City. The "Draper route," on the other hand, was to begin in South Lawrence and its closest connection to Lowell would have been in Tewksbury. The debate over these two proposals also played out in the newspapers of Lowell and Lawrence. See "The Draper Route," *Lowell Daily Courier*, February 26, 1870; "Lowell and Framingham Railroad," *Lowell Daily Courier*, February 24, 1870. In early March the legislature approved the charter of Carpenter's Framingham & Lowell Railroad. See "The State Legislature," *Lowell Daily Courie*r, March 5, 1870.

[169] For list of Lowell residents who signed the articles of association for incorporating the Lowell & Andover Railroad see "Lowell & Andover Railroad Company," *Lowell Daily Courier*, April 22, 1872. The railroad's board members are identified in "Lowell & Andover Railroad," *Lowell Daily Citizen*, February 14, 1877.

originally planned as a spur line running from Belvidere, on the east side of the Concord River, to Ballardvale south of Andover, where it was to join with the Boston & Maine Railroad, which, from Ballardvale, extended to Boston.[170]

In negotiations with the larger railroad, officials from the Boston & Maine demanded that the Lowell & Andover have its terminus in downtown Lowell, on Central Street, and that it also connect with the Framingham & Lowell road in Ayer's City. Although an agreement reached in early 1873 and the Lowell & Andover was capitalized at $375,000, the company had difficulty selling shares of stock and the route into Lowell's downtown required not only additional survey work, but added to the complexity of the project with multiple purchases of land from property holders along Central Street.[171]

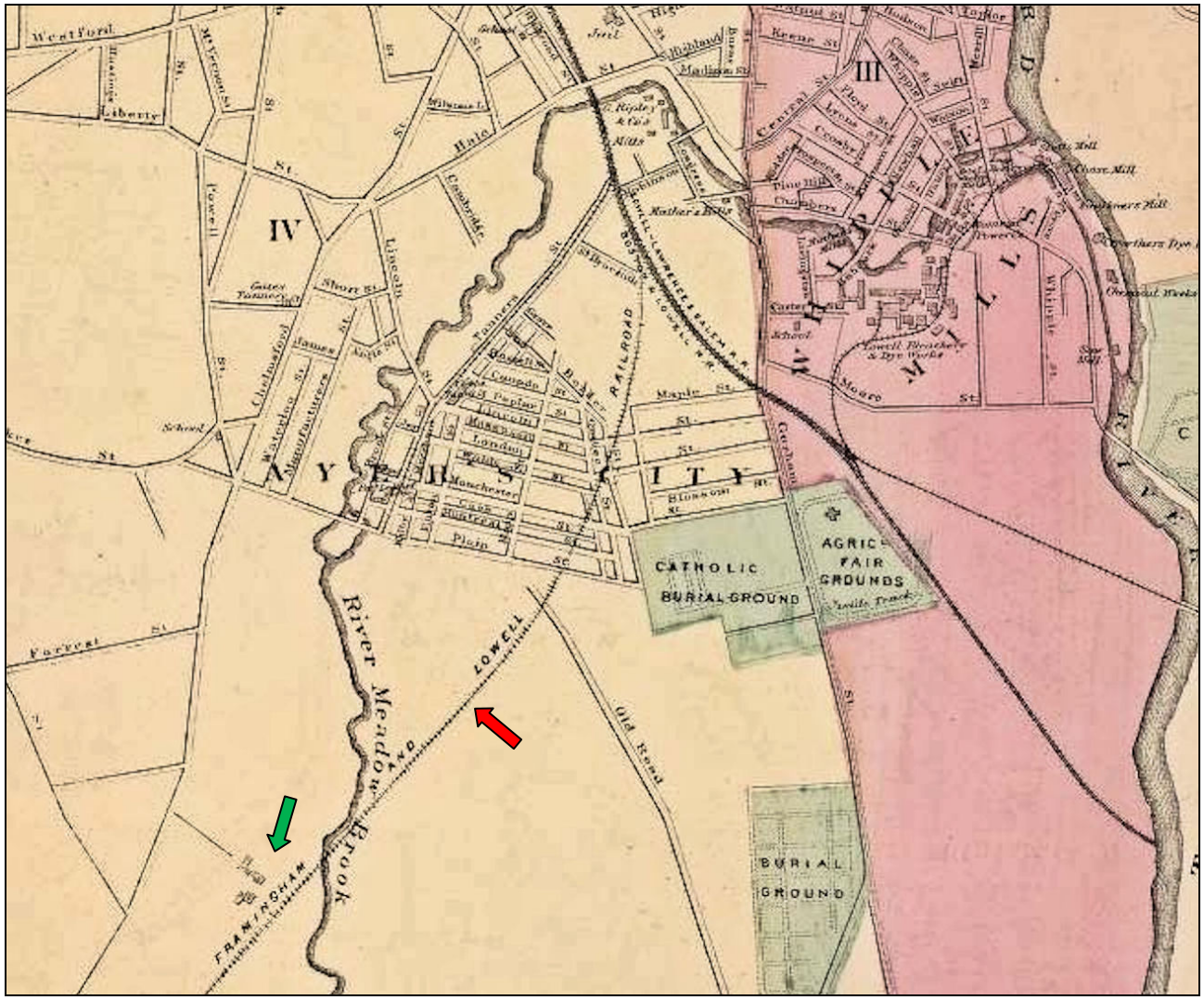
Connecting the Lowell & Andover Railroad to the Framingham & Lowell road through Ayer's City proved far less difficult. Just south of Lowell Cemetery, along Whipple Street (now Lawrence Street) on the east bank of the Concord River, the

This aerial view shows the abandoned Lowell & Framingham Railroad, later the Old Colony Road, crossing River Meadow Brook and running below the Lowell Connector. The area to the right, around the Lowell Connector, was once part of the tilled lands of the city's poor farm. The modern industrial buildings to the left, on Industrial Avenue East, are part of Arlin Manufacturing Company, Inc., producers of plastic film. This part of the brook was relocated as part of the early 1960s Lowell Connector construction and the railroad bridge crossing the brook was erected at this time.

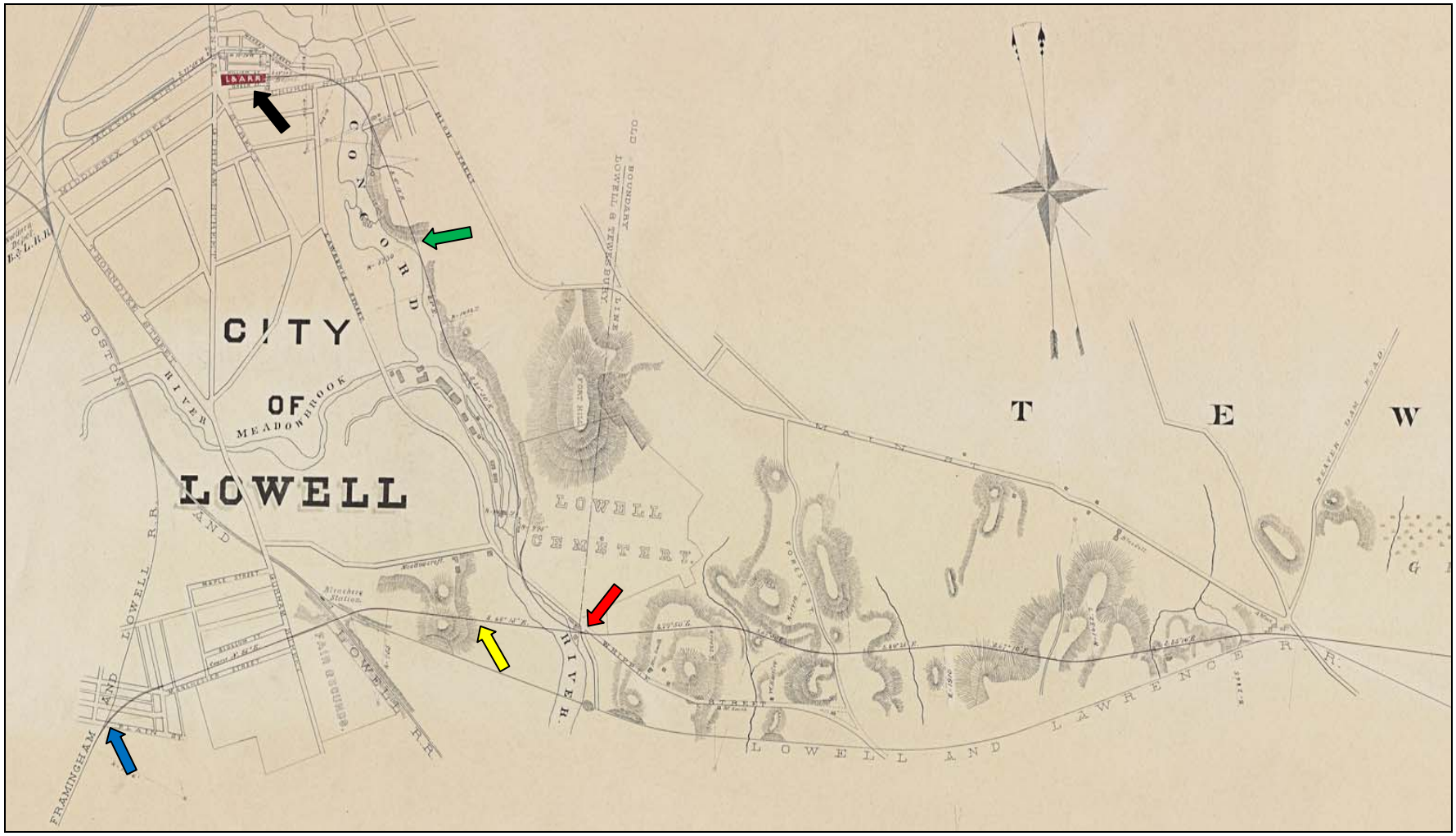
Lowell & Andover line divided, with one branch running north along the river and the other extending west across the river to the Bleachery Station. This branch then ran southwest through Ayer's City parallel to Manchester Street and curved across Manchester, Montreal, and Plain streets, where it joined the Framingham & Lowell road.

[170] The various controversies over the Boston & Lowell Railroad's monopolistic practices and its attempts to block the Lowell & Andover Railroad project, as well as the debate over the route of the Lowell & Andover road into downtown load are seen in a city council hearing held at the end of December in 1872. See "Lowell and Andover Railroad, Hearing on the Route into Lowell," and newspaper editorial in the *Lowell Daily Courier*, January 1, 1873.

[171] For the difficulty in selling the railroad company's stock see "Lowell and Andover Railroad," *Lowell Daily Citizen & News*, October 31, 1873. For an account of construction delays see "Lowell and Andover Railroad, Why the Construction has been Delayed," *Lowell Daily Courier*, October 18, 1873.



The Framingham & Lowell Railroad branched into Ayer's City near St. Hyacinth Street and cut through the middle of this section of Lowell. All of the railroad crossings were at street level, which often proved perilous to pedestrians, as well as those on horseback and wagons. The rail line crossed River Meadow Brook by Lowell's poor farm (green arrow) and the city council agreed to cede five acres of its land to the railroad company for the route through this southernmost part of Lowell. (Source: R. W. Baker's atlas of the City of Lowell, 1871.)



The Lowell & Andover Railroad branched just east of the Concord River (red arrow), near the Lowell Cemetery, with one line running north (green arrow), along the east side of the river, and into Lowell's downtown to the passenger station (black arrow) on Central Street. The other line (yellow arrow) extending west to the Bleachery Station and through Ayer's City where it joined with the Framingham & Lowell Railroad (blue arrow) by Plain Street. (Source: Edward Appleton, "Map and Profile of Lowell & Andover RR, Built A.D. 1874," in State Library of Massachusetts.)

Work began on the Ballardvale section of the road in January, 1874, and after a strike of railroad laborers briefly halted progress in February, construction began in Lowell in March. By August the track through Ayer's City was laid and a construction train passed over the rails. A small group of residents cheered as a locomotive passed in front of them. It was not until December, however, when the final celebratory spike was driven before a larger gathering in downtown Lowell. One of the first freight shipments on the newly completed line was a load of flannels from Stott's Mill.[172]

Old Tanneries and New Industries

Apart from the two railroad lines, there was very little development in Ayer's City throughout the remainder of the decade. The short, but intense economic depression in 1873-74 was felt in the textile and leather manufacturing industries and for a number of months unemployment steadily rose in Lowell. Hubbard and Blake shuttered their tannery and for Elbridge Cook the economic downturn proved to be a disaster. First, in March, 1874, another fire completely destroyed Cook's factory and all of the tanning machinery. Insurance covered only about two-thirds of $80,000 that Cook lost from the fire. In the summer of that year he contracted with a local builder, Bartlett & Sons, to reconstruct the tannery in the same location.[173] Although he reopened, Cook never recovered financially. He became insolvent in early 1876, and was forced to close his tannery business, as well as sell his real estate holdings in Lowell.[174] William Andrews of Woonsocket maintained his ownership of the tannery property and he promptly leased the factory to Andrew N. Shepard, a leather merchant residing in Winchester, Massachusetts. Shepard, in turn, brought an experienced tanner, Frank Ellis, from Windham, Vermont, to oversee manufacturing. Ellis would stay at the Ayer's City tannery for the remaining years of its operation.

The A. N. Shepard & Company was in business for about three years before the firm of Arey, Maddock & Locke assumed control of the tannery in 1879. Like most other leather dealers in eastern Massachusetts, Arey, Maddock & Locke had a

[172] City and Vicinity," *Lowell Daily Citizen & News*, January 12, 1874. The strike, involving about 700 workers, many of whom were Irish immigrants, was widely reported. See "Laborers' Strike," *Syracuse [NY] Daily Courier*, February 17, 1874. For construction work in Ayer's City see "City and Vicinity," *Lowell Daily Citizen & News*, August 28, 1874; "Lowell and Andover Railroad—Driving the Last Spike," *Lowell Daily Citizen & News*, December 17, 1874.

[173] "Destructive Fire—Cook's Tannery in Ayer's City Burned," *Lowell Daily Citizen & News*, March 27, 1874; "City and Vicinity," *Lowell Daily Citizen & News*, June 11, 1874; "Cook's New Tannery, *Lowell Daily Citizen & News*, July 9, 1874.

[174] Cook sold his assets in Lowell, but appears to have held onto his farmstead in Milford. An insolvency notice for Cook appears in the *Lowell Daily Courier*, February 9, 1876. His sons Orville, who had managed the tannery, and Revilo, who assisted in the tannery operations, were forced to find work elsewhere. After Hubbard and Blake closed their Lowell tannery Jesse Blake retired to his farm in North Tewksbury while John Q. A. Hubbard continued to live in Lowell and was involved in the tannery business in Olean, New York, and Leominster, Massachusetts. See *Boston and Bostonians*, (New York: 1894), p. 94. Hubbard, who owned the factory property on Tanner and Manchester streets, held onto this real estate and leased the building to a glue manufacturer, Jonathan Holt, in 1879. See "The City's Growth," *Lowell Daily Courier*, July 24, 1880.

Ayer's City boasted only about 30 dwellings and two tanneries in 1876, when this bird's-eye view of Lowell was drawn. Yet the artists inaccurately depicted this area as a largely undeveloped tract of land containing meadows and forests. An unlabeled Tanner Street (shown with blue arrow) runs from the Whithed & Company's coal yard and warehouse (black arrow) to the Lowell Tannery (brown arrow) at Lincoln Street. Note that the Framingham & Lowell Railroad appears to the upper left (red arrow).

selling house in Boston with tanneries located in the "leather manufacturing belt," from Lynn, Peabody, and Danvers, west through Woburn and north to Lowell. When Reuben Arey, Jr., and George H. Maddock formed Arey & Maddock in 1875 their silent partner, the Cambridge, Massachusetts, leather merchant Simeon Snow, who had been in the leather business with Arey, was the major financial backer. After assuming control of the Lowell tannery, Arey and Maddock brought in another partner, John Locke, who also resided in Cambridge. They quickly expanded production, employing 150 men under the supervision of Frank Ellis. Within a year they invested additional capital in the tannery and constructed a three-story, wood-frame factory building on the west side of Tanner Street. This new factory was used for cleaning, splitting, treating, and finishing hides. Similar to the earlier years of the tannery most of the leather goods produced here were used in the shoe industry.[175]

The arrival of the Arey & Maddock tannery to Ayer's City coincided with the first major boom in this section of Lowell that had been envisioned 30 years earlier by Daniel Ayer. Above the grassy east bank of River Meadow Brook, industrial buildings soon extended along either side of Tanner Street. Most notably this included the foundries and iron works of Scannell & Wholey, Richard Dobbins, and the Union Iron Foundry; the Merrimack Croquet Company's factory (at the east end of Tanner); the Coburn Shuttle factory; the Haworth & Watson Paper Tube Company; the Holt Glue factory; the Sawyer Carriage Company; and two textile manufacturers, Pickering Knitting Company and Criterion Knitting Company. In addition, the railroad companies expanded the freight houses and rail sidings and in 1883 the Boston & Lowell Railroad had a new roundhouse constructed next to the brook along Howard Street at the northernmost end of Tanner Street. All of the factories were powered by steam engines with coal-fired boilers generating the steam. The combination of smoke-emitting iron foundries, along with coal smoke from factories, railroad locomotives, and chimneys from the growing number of dwellings, which were heated largely with anthracite coal, produced a pall over Ayer's City, especially during the cold months.[176]

Sewage and the Pollution of River Meadow Brook

Although the smoky air of Ayer's City was only occasionally mentioned in the late 19th century, the rising problem of inadequate sewerage and the pollution of River Meadow Brook received increasing attention. In the summer of 1881, for example, effluent from the Arey & Maddock tannery poured

[175] The formation of Arey & Maddock is found in a legal notice published in the *Boston Daily Advertiser*, January 2, 1875. This notice indicates that the new firm was a merger of Simeon Snow & Co., of which Reuben Arey, Jr., was a partner, and George H. Maddock & Co. Arey & Maddock took over the tannery in the spring of 1879. See "Locals in Brief," *Lowell Daily Citizen*, April 16, 1879. The addition to their tannery is given brief mention in "The City," *Lowell Daily Courier*, April 21, 1880.

[176] The growth of Ayer's City as seen in the development of industrial, residential, and transportation structures may be seen by comparing the city atlases showing this section of Lowell for 1879, 1882, and 1892. These atlases along with city directories for Lowell throughout the decade of the 1880s (which list these industrial companies, as well as Ayer's City dwellers) are available at the Center for Lowell History, University of Massachusetts Lowell. For a brief article on the railroad roundhouse just prior to its construction see "Boston and Lowell Railroad," *Lowell Daily Courier*, August 15, 1883.

into the brook so that "dead fish by the score were seen upon the surface of the water … [and] live fish were seen in considerable numbers with their heads partially out of the water, preferring a little air to the element that nature designed them to live in."[177] The tannery was cited again for polluting not only the stream but also vacant lots surrounding the factory.[178] In fact, in a lawsuit over the disputed title to Ayer's City property brought by Earl Thissell and Edwin Lamson against Arey & Maddock and the property owner William H. Andrews in 1889, the plaintiffs charged that "for six years Arey & Maddock have unlawfully and without right discharged and caused to flow large quantities of foul, dirty, impure, noxious, offensive, and ill-smelling poisonous waters up and over lots owned by the said Lamson and Thissell." The plaintiffs demanded compensation for the resulting damage to their lands. It appears that the parties involved in this dispute settled without going to court.[179]

The practices of a related industry on Tanner Street, a glue factory, prompted the city to take action that ultimately led to the company curtailing its operations. Jonathan Holt & Co., a partnership between English immigrant Jonathan Holt and Lowell-born Frank J. Sherwood, began manufacturing glue in the former Hubbard & Blake tannery in 1879. The main factory building was a two-story wood-frame structure measuring 30 feet by 80 feet. The company obtained its raw materials, consisting of wastes from cattle hides, called "trimmings," along with hoofs and tails, from Arey & Maddock and other nearby tanneries. On the second floor of the factory, workers placed this extremely foul-smelling "stock" in large vats and covered it with lime. Over the course of a week or more, the lime would then dissolve the blood and animal tissue while saponifying the fats. Prior to heating this gelatinous mass, workers poured a solution of sulphuric acid and, after several more days of "stewing," the stock was poured into large kettles containing water into which steam was introduced.

In another room on the second floor of the factory, workers steamed the stock for a full day and then removed the grease and oils which the steam heating separated from the "glutinous portion of the stock." This thick "jelly-like liquid" was then conducted through pipes down to the first floor where it emptied into metal pans and cooled. These "glue cakes," which were one foot square by one foot thick, congealed as they cooled. With a cutting machine, workers then sliced these cakes into thin blocks and placed them on large nets on a wooden platform outdoors where the drying process was completed. These slices of glue were then packed in barrels and shipped to the company's customers, which included many of Lowell's textile mills, as well as wood-working concerns, book binders, and paper box manufacturers in Boston and Lowell. Holt & Company employed a half-dozen men who

[177] "The Proposed Marginal Sewer in Wards 3, 4, and 6," *Lowell Daily Courier*, April 28, 1882.

[178] According to the annual Massachusetts Board of Health report for 1886, two years earlier "refuse from [the Arey & Maddock] tannery in Ayer's City … killed a large number of fish" in River Meadow Brook. This report noted that there were other factories located along the brook, but no other "nuisances" were reported. See Massachusetts Board of Health, *Eighteenth Annual Report of the State Board of Health of Massachusetts*, (Boston: 1887), p. 212.

[179] "Who Owns This Land?" *Lowell Sun*, August 24, 1889.

produced nearly 35 tons of glue and ten tons of grease each year.[180]

Jonathan Holt & Company was the only glue maker in Lowell and although the factory produced far less affluent than the neighboring tanneries, it emitted overwhelmingly noxious odors especially during hot summer months. In 1882 John M. G. Parker, a large real estate holder in Ayer's City, spearheaded a petition to the city council to shut down the operation.[181] Lowell's Board of Health eventually handled the matter and, in a compromise, restricted glue production to the colder months of the year.[182] This was a relatively rare 19th century example of the city intervening in a manner that restricted the actions of a manufacturing enterprise. There is no indication that Holt & Company legally challenged this order and the firm, which remained in business until 1932, apparently complied with the Board of Health.[183]

The building boom in Ayer's City coincided not only with a rising population in Lowell, (during the 20-year period between 1870 and 1890 the Spindle City grew from about 41,000 persons to nearly 78,000 and this included large numbers of immigrants from French Canada, Ireland, the British Isles, Sweden, and Poland), but also with an enlarging array of municipal services. In 1873, the city had undertaken its single largest capital expenditure with the construction of a municipal water supply, which drew water from the Merrimack River and featured a pumping station in the Centralville district, as well as a reservoir on Christian Hill. Service to various parts of Lowell, including Ayer's City, was provided by a gravity-flow system from the reservoir. This waterworks was joined with an unprecedented expansion of Lowell's sewerage system the design for which the city contracted with consulting civil engineer David W. Cunningham.[184]

Although in 1872-73, when Cunningham led the survey and planning of the sewerage system, Ayer's City had only a few dozen residents, the final plan included an important element for the drainage area of River Meadow Brook, an intercepting

[180] For every barrel of glue that Holt & Company produced it also obtained 700 pounds of grease, which was also sold primarily to manufacturing interests that used it as a lubricant. For a comprehensive report on this enterprise see "A Glue Factory," *Lowell Evening Citizen*, March 20, 1888. Also see "Ayer City Industries," *Lowell Morning Times*, May 8, 1886; and "Jonathan Holt & Co.," *Inland Massachusetts Illustrated*, (Worcester: 1891), p. 269.

[181] "City Council Meeting," *Lowell Weekly Sun*, September 2, 1882.

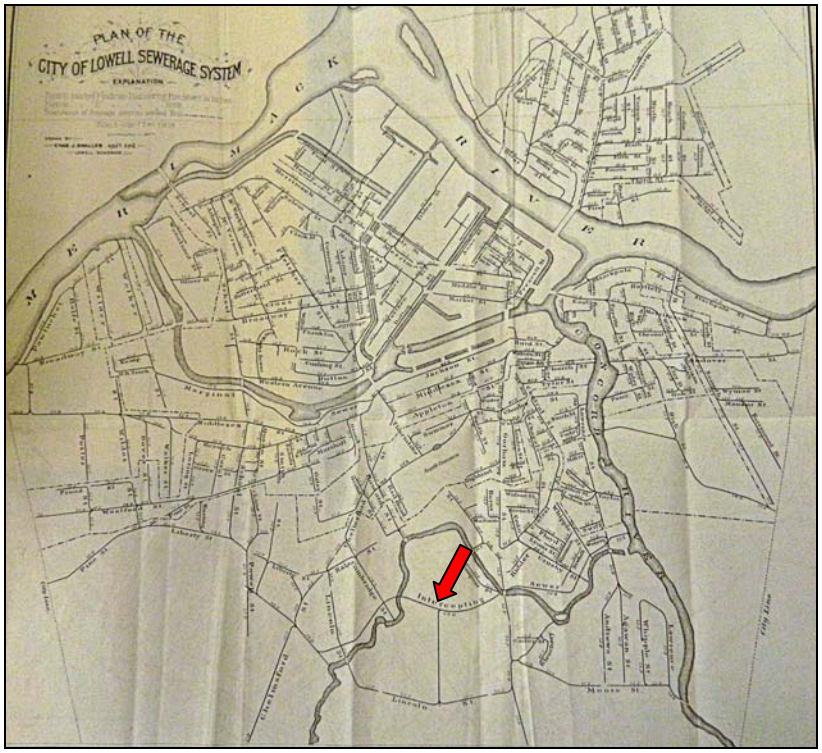
[182] The city's Board of Health issued this order in September, 1895. See *Commonwealth of Massachusetts, The Annual Statistics of Manufacturers, 1895: Tenth Report*, (Boston: 1896), p. 273.

[183] Jonathan Holt died in 1926, but his partner Frank Sherwood continued manufacturing glue in Ayer's City for six more years. Abandoned for several years after the factory closed in 1932, the wood-frame buildings caught fire and burned to the ground. See "No Evidence of Incendiarism into Pair of Ayer's City Fires," *Lowell Sun*, November 9, 1936.

[184] As Theodore Steinberg points out, the initiation of large-scale municipal waterworks required that city's expand sewerage systems to handle the massive amounts of liquid waste produced by the many users of city water. Steinberg also observes that in the Merrimack Valley's urban-industrial centers, sewerage systems conveyed these wastes into the major streams and rivers. See Steinberg, *Nature Incorporated: Industrialization and the Waters of New England*, (Cambridge, England, and New York: 1991), pp. 223-225.

sewer. "I have made provision for an intercepting sewer," Cunningham explained, "to be built from the foot of Lincoln Street to the foot of Cambridge Street, near the brook, and thence crossing it under the two railroad banks, and following a natural depression to a point near the Gorham Street bridge, thence crossing the brook again through Chambers Street, and by the north bank of the brook to the Concord River." Cunningham noted that the total length of this sewer would be nearly 5,400 feet and that its recommended size, with a cross section of 72 inches in diameter, "is the largest contemplated in the system." The engineer concluded that "it would be many years before the growth of the population [in this part of Lowell] will be sufficient to make it necessary." In the meantime "all sewers will drain into the brook."[185]

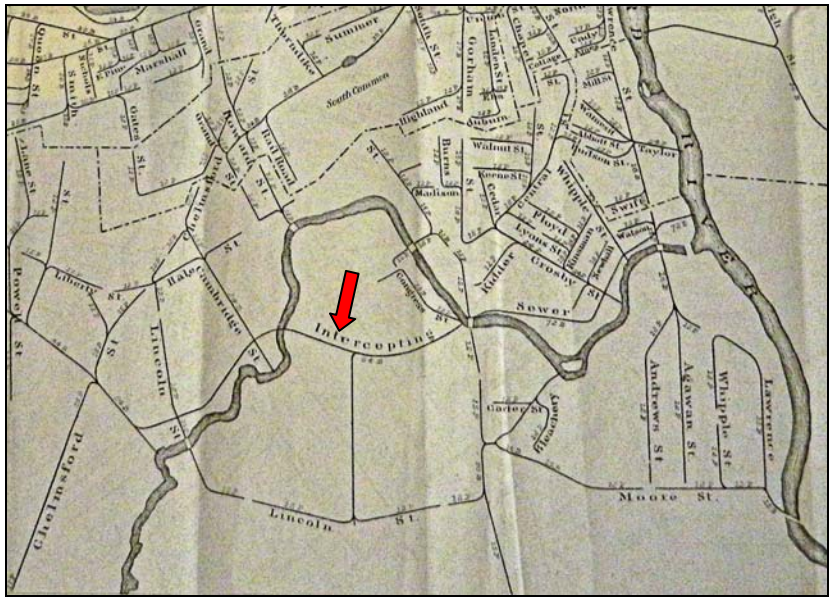
By the early 1880s it was patently clear to the growing number of Ward 3 residents, especially those living in the vicinity of the brook, that the intercepting sewer was needed to alleviate the worsening conditions in and along the waterway. Household and street wastes from sewers on Lincoln, Cambridge, Howard, Congress, and Thorndike streets spewed into the brook. Especially during low flow in the summertime the sluggish and fetid waters overwhelmed the senses. In 1881, the aldermanic committee on sewers recommended funding for the Cunningham-designed interceptor sewer, proclaiming that "the [prevailing] system of discharging sewage in large quantities into River Meadow Brook, which during the summer



The plan for Lowell's sewerage system that civil engineer David Cunningham developed for the city prior to the construction of the municipal waterworks included the intercepting sewer (red arrow) for draining a large part of the River Meadow Brook valley. (Source: Center for Lowell History.)

months is little more than a puddle of stagnant water, is entirely wrong and productive of evils which should be obviated at the

[185] David W. Cunningham, "Report to the Committee on Sewers and Drains of the City of Lowell," *City Documents of the City of Lowell, for the Year 1873-74*, (Lowell: 1874), p. 47.



This detail of Cunningham's design shows the intercepting sewer that was to drain nearly 1,000 acres of land along River Meadow Brook and empty the effluent into the Concord River. The intercepting sewer was constructed in 1883-84.

earliest possible moment."[186] The common council, however, refused to vote the necessary funds for construction.

In the wake of a growing number of petitions from Ayer's City residents and pressure from the Lowell's Board of Health, the city council approved the construction of the intercepting sewer in 1882. The municipal government authorized $300,000 for the project, which closely followed the Cunningham design.

[186] "Special Meeting of the City Council," *Lowell Daily Courier*, August 3, 1881.

Construction began in early 1883 with most of the work concentrated on the section between Gorham Street and the Concord River. Instead of contracting out all of the construction much of it was done by the city with 300 to 400 men employed at various times of the year. A great deal of tunneling was required for the 72-inch diameter brick sewer with some segments of the line near the Concord River being 30 feet below grade. By August, 1883, the line from Gorham Street to the Concord River was completed. Difficult soil conditions, combined with a rock ledge along Lincoln Street, slowed the project in Ayer's City. For a few weeks in the spring of 1884 work was suspended when the city ran out of funds. Soon after the city council approved an additional $10,000 final construction resumed at the Chelmsford Street end and in May the project was completed.[187]

A Fouled Brook and Early Protests

With the opening of the new intercepting sewer, a large amount of household and street wastes was diverted away from River Meadow Brook and into the Concord River. (The sewer outfall was located below Massic Falls.) Yet, additional residential growth with an absence of sewer lines continued to plague Ayer's City. Many dwellers used privies or dry wells, which often functioned poorly, fouled the air, and promoted various infectious diseases most notably typhoid and diphtheria. In 1886 the Board of Health notified the city council that a lack of

[187] "Mayor Donovan's Letter," *Lowell Weekly Sun*, December 8, 1883; "Sewer Inspection by Members of the City Council," *Lowell Daily Courier*, September 13, 1883; "Progress of the Big Sewer," *Lowell Weekly Sun*, August 25, 1883; "The Intercepting Sewer," *Lowell Daily Courier*, January 22, 1884; "Resumption of Sewer Work," *Lowell Weekly Sun*.

sewers in such areas as Congress Street, along River Meadow Brook, wholly lacked "proper house drainage" and that "the storage of human excreta in these localities has caused much sickness and increased the annual death rate." The board singled out Ayer's City, noting that "some portions [are] thickly settled and needing immediate relief.[188] Aaron Jacobs, a carpenter and long-time resident on Congress Street, decried the current conditions in his neighborhood and pled for a sewer. "We have drained into dry wells as long as we can. It is necessary that we should have this sewer or move out, as our dry wells are spoiling our cellars and running out on top of the ground in front of our houses."[189]

In the summer of 1886, with sanitary conditions growing even worse, members of the Board of Health, accompanied by a group of newspaper reporters, toured the area and publicized their dismal findings. They focused especially on the home-owning, middle-class residents, observing that they "are in a constant state of misery because they have no adequate means of disposing of their sewage, which makes the locality an undesirable place of abode." They found that the typical practice of disposing of household wastes was to "dig a dry well in the back yard, drain into it until it becomes full and the filth oozes out upon the surface … [and] then they dig a new well a short distance away and use that until it becomes full." Before long all parts of the yard become "soaked with foul and decaying sewage." Directing their fire at the city council, the Board of Health declared that despite constant petitioning to municipal authorities by property owners who "begged and prayed for sewers," their efforts "have been unavailing."[190]

Although municipal authorities responded with the construction of some sewer lines in Ayer's City, complaints of poor sanitation and fouled air continued into the early 20th century. In the 1890s, however, a great deal of criticism was directed at the "Hale's Brook nuisance." Leading this charge was a controversial lawyer and maverick Republican party operative, Jerome F. Manning, who was also a Ward 3 resident. Born in Merrimack, New Hampshire, in 1838, Manning was the son of a wealthy physician who settled with his wife and family in Lowell in 1841. The young Manning graduated from Phillips-Exeter Academy and then Dartmouth College, whereupon he returned to Lowell and studied law. He lived with family and relatives in the house of his widowed mother on Gorham Street, near the South Common.[191] It was from this residence that Manning would become one of the city's most vocal critics of the municipal government, notably those controlled by the Democratic party. This he joined with scathing attacks on the city's inaction over the pollution problems of River Meadow Brook.

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[188] This Board of Health petition to the city council was published in the *Lowell Daily Courier*, June 2, 1886.

[189] "Committee on Sewers," *Lowell Daily* Courier, July 20, 1886.

[190] "They Beg for Sewers," *Lowell Daily Courier*, July 30, 1886.

[191] There is scant biographical information on Jerome Manning. Several sources include: Manning's obituary, *Lowell Daily Mail*, December 17, 1906; background on his father and mother in Clara A. Carter and Sarah A. Carter, *Carter: A Genealogy of the Descendents of Samuel and Thomas, Sons of Rev. Samuel Carter*, (Clinton, MA: 1887), p. 232; city directories for Lowell, 1844, 1878, 1888 & 1894; and the federal decennial census of Lowell for the years 1850, 1860, 1870, 1880, and 1900.

For a number of years, prior to his activism in Lowell, Manning practiced law in the office of Judge Edward Mellen in Worcester, Massachusetts. In the 1860s he gained renown for his skills as an orator and lecturer, and traveled widely through northern New England. He married a young Norwegian immigrant in Worcester before returning to Lowell with his wife in the early 1880s and residing again in the Gorham Street house. As an attorney practicing on his own, Manning represented several clients before the Court of Commissioners of Alabama Claims, a federal judiciary established in the 1870s to decide on claims against the Confederate states for financial compensation, stemming from property or other maritime damage from the Confederate navy. His fiery disposition and a series of angry exchanges with the judges resulted in his disbarment from this federal court, an action Manning legally challenged all the way to the U.S. Supreme Court. In Lowell Manning was a staunch Republican, participating in local and statewide political committees. But he justly gained a reputation for speaking his mind and frequently challenging friends as well as antagonists within his own party.[192]

Manning's campaign to "abate the nuisance" of River Meadow Brook appears to have originated with his role as president of the Ward 3 Republican Club in 1890. For a number of years this ward had been predominately Democratic and in an attempt to revitalize Republican voters in this section of the city the Manning-led club began holding a series of regular meetings. Many were held at Templars Hall, an unprepossessing wood-frame building on Gorham Street, extending over the bank of the brook. In addition to voter registration and naturalization duties, club members included in their political "platform" physical improvements to the neighborhood. Hale's Brook quickly became the focus of the club's and Manning's neighborhood improvement efforts.[193]

Whereas Manning's house on Gorham Street was a comfortable distance from the brook, the area around Templars Hall, where he harangued about the ineffective and even corrupt actions of city officials in dealing with pollution problems, often reeked from the stream's stench. This fouled air was especially acute around the mill pond during the hot days of summer. In one speech, Manning maintained that the "Hale's Brook plague-spot" was a barrier to further economic development in the otherwise rapidly growing southern and western sections of the city. "The march of public and private improvement," Manning exclaimed, "is impeded by this foul monstrosity, where is deposited the accumulated foulness and filth of that section [of Lowell] for the last twenty years." He

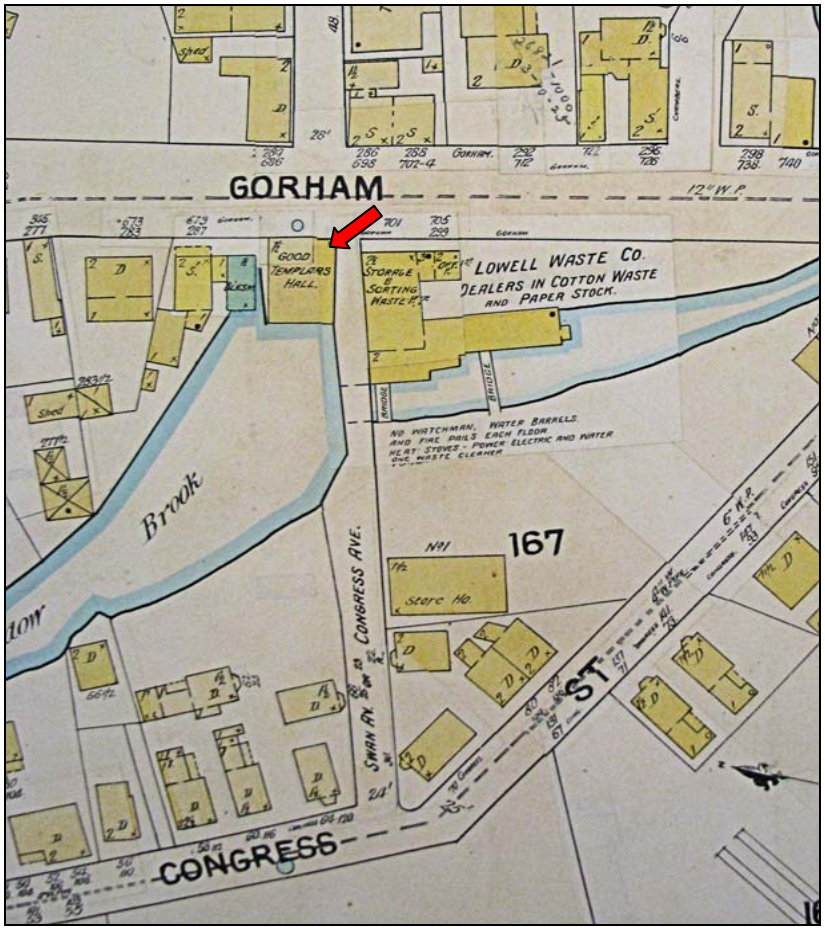
[192] "An Attorney Disbarred," *New York Evening Post*, July 29, 1885; "Alabama Claims Commissioners Sued," *Lowell Daily Courier*, October 14, 1886. Manning lost this Supreme Court case. For an example of Manning's declamations aimed at his own party before a gathering of Republicans, see "Quigley Endorsed," *Lowell Sun*, October 27, 1898. Manning opposed the McKinley administration's imperial designs for the Philippine Islands. He also served as vice president of the Universal Peace Union, a Quaker organization opposed to the Spanish-American War.

[193] The Republican newspaper, the *Lowell Daily Courier*, frequently reported favorably on the activities of the Ward Three Republican Club. See, for example, "Ward Three Republicans, A Permanent Organization Formed for Political Work," *Lowell Daily Courier*, January 6, 1890.

demanded that the Board of Health take punitive measures against those responsible for the fouling of the stream.[194]

In 1893 members of the Board of Health decided to examine the condition of River Meadow Brook, not because of Manning's importuning the city to take action, but because of concern that part of Lowell's water supply, which drew from wells along the brook, was being threatened by burying municipal garbage in the vicinity of this well field. The board's inspection of the brook's condition was quite comprehensive and identified sources of pollution from Chelmsford Center, through Ayer's City, and in the vicinity of Hale's Mills.

In its report the Board of Health noted that some distance before the brook entered Lowell impurities were introduced into it from the many farms along its "circuitous route." The most serious pollution problem in Chelmsford, however, originated from surface water from the town's streets, the hotel in the town's center, several dwellings, and a privy associated with a saw and grist mill, all of which emptied wastes directly into Beaver Brook, a tributary of River Meadow Brook. The distance over which the effluent-laden Beaver Brook flowed before it reached River Meadow Brook was about three-quarters of a mile.



Lowell's Mount Zion Lodge of the International Organization of Good Templars, a 19th-century temperance organization, raised sufficient funds to pay for the erection of the Good Templars Hall in 1886. As seen in this detail from an 1892 atlas of Lowell, the building extended over River Meadow Brook on Gorham Street and was located next to the dam and the Lowell Waste Company factory of Josiah Butler. (Source: Center for Lowell History.)

[194] Manning's first public speech on the pollution problem of River Meadow Brook occurred in early 1890 at the Good Templars Hall. See "Ward Three Club: The Hale's Brook Nuisance, a Subject of Comment by President Manning," *Lowell Daily Courier*, February 22, 1890.

In Lowell, the drainage of wastes into the brook was even more acute. In the southernmost section, the city's poor farm, containing nearly "400 inmates," conveyed its wastes through a 12-inch pipe into the stream. "The stream at this point," the Board of Health reported,

> is sluggish and there was at the time of inspection a deposit of human excrement on the bottom of the brook , which measured six feet by fifteen, and was four feet deep. When the mass was disturbed to ascertain its depth, it gave forth gases of a noxious character. If there is any danger to the water from surface pollution, this putrescent mass of ordure, the scourings of an institution harboring 400 persons, many of whom are suffering in its hospital from loathsome ailments, ought certainly to be removed before complaint is made of anything that may possibly enter the brook below the driven wells.[195]

Farther downstream conditions were equally appalling. From the poor farm to the dam, the board observed, "the brook is an open sewer." Over this half-mile distance the stream varied in width from 20 to 40 feet, but the last 500 feet was the mill pond behind the dam and here the width was about 120 feet. "The waters are shoal" over most this length with the depth ranging from one to six feet. However, the mill pond, depending on the season was from six to eight feet deep. "Into this almost stagnant body of water pours the sewage from two city sewers, the sewer from the jail, and 27 private drains." The board also pointed out that there were nine privies next to the brook, "a small tanning establishment that empties its liquid refuse into the brook, a woolen mill which discharges scourings and dye house lees, the Thorndike Manufacturing Company, and Walter Coburn's Mill, all draining into the brook."[196]

Added to this filth in the brook, were wastes from an outlet sewer draining several streets and 24 households, amounting to "200 cubic feet of solid sewage matter." The board pointed out that much of this solid waste "is exposed when the water in the brook is low, the odors emitted in the summer time are unpleasant, and the noxious gases given off are dangerous to public health." Near the Howard Street bridge over the brook there were more privies, including one from the Boston & Maine Railroad roundhouse used by 50 men and another belonging to the Horne Coal Company used by 15 men employed by that concern. Nearby the sewer pipe from the city jail, holding some 100 prisoners, discharged into the brook. At this point the brook was "thoroughly impregnated with the filth that pours from this drain." The board summed up that in Lowell the brook received wastes from 154 privies and water closets and 177 sinks, and the total population "living on the line of drainage is 912." "The water charged with this filth," the board concluded, "is black and foul and gives out exhalations which may at any time be the source of grave consequences, not only to the community thereabout, but to the entire city."[197] Despite the movement of the Board of Health to

[195] *Sixteenth Annual Report of the Board of Health of the City of Lowell, for the Year 1893*, pp. 23-24, published in *City Documents of the City of Lowell, Massachusetts, for the Year 1893-1894*, (Lowell, MA: 1894).

[196] *Sixteenth Annual Report of the Board of Health of the City of Lowell, for the Year 1893*, pp. 24-25

[197] *Sixteenth Annual Report of the Board of Health of the City of Lowell, for the Year 1893*, pp. 25-26

condemn "as a common nuisance" the portion of the brook from the poor farm to the dam, the city council could not be stirred to action.

Throughout the 1890s, in letters and speeches, Manning continued to call attention to the "pest hole" of Ward 3 and offered recommendations to improve the brook's condition. He wrote a lengthy series of letters to one of the city's Republican newspapers, using his considerable legal knowledge and colorful writing skills to argue on behalf of his proposals. In one particularly acerbic communication he wrote:

> The twin public matters of the greatest and most pressing importance to the welfare and progress of Lowell are streets and sewers. In this respect the city is entirely without system or merit. Both the management and detail are left at the haphazard whims, prejudices, and ignorance of the humming bird statesmen who annually flit in and out of City Hall…The highways and drains should also be in the care and control of a special commission—with unlimited powers, except as defined in the regulations creating the commission. Put the responsibility there and in a brief period the changes, improvements, and betterments would appear as if by magic. Put brains and character at the head, and the gratifying results would be astonishing to those who plod on wearily after the pace set by the peanut and putty politicians who have a 'pull' at City Hall and in the caucuses.[198]

Manning also decried the common sanitary practice of cities of disposing of sewage into streams and noted that the Massachusetts legislature had recently halted the city of Worcester from dumping its municipal wastes into the Blackstone River. "These foul solids," Manning protested, "should have gone elsewhere and only surface waters and liquid drainage [should be] turned into sewers." Manning concluded, "If anyone doubts this, let him take a canoe journey down Hale's Brook and spend a few hot nights in this stink pot district."[199]

To improve the brook's fouled condition Manning offered a number of proposals all of which called for the city to undertake major public works projects. One idea Manning advanced was to dig a channel from the brook near Plain Street to the Concord River thereby entirely eliminating the flow of the stream through the Hale's Mills and Bleachery districts.[200] A second proposal entailed straightening the channel along Tanner Street, just beyond the Howard Street bridge where the stream curved toward the Concord River, removing the dam at Hale's Mills, and cleaning the mill pond there "at the expense of the mill and dam owners." For the brook straightening Manning believed the city should undertake this work using monies from municipal taxes. Such an investment of public

[198] "Set the Political Scrubbing Brush to Work," *Lowell Mail*, July 31, 1894.

[199] "Set the Political Scrubbing Brush to Work," *Lowell Mail*, July 31, 1894.

[200] Manning put forth this idea at one of the early Good Templars Hall meetings that was attended by one of the city's alderman. In response to Manning's proposal, the alderman asked him if by simply removing the sewage from the brook "would it not be as good as 80 years ago?" Clearly irked by this vague reply, Manning, shot back that "the alderman might be content to live in a dugout [80 years ago], but it would not be good enough now." "Hales Brook Nuisance," *Lowell Daily Courier*, March 21, 1890.

funds, he maintained, would be repaid by fostering additional real estate development and thereby increasing tax revenues.[201] One of Manning's adversaries was a powerful local businessman and stalwart in the city's Democratic party, Josiah Butler. Since 1873, when Butler acquired the water rights for River Meadow Brook, as well as the dam and mill property that was originally part of Hale's Mills, he had operated his Lowell Waste Company, producers of cotton batting. For over 20 years he used the water in the mill pond behind the dam for powering a turbine, but supplemented the water power with a steam engine, the boiler for which was supplied with water from the pond. But in the summer of 1894 Manning aimed his attack squarely at Butler's Lowell Waste Company. He cited the Massachusetts Supreme Court decision in "Eames v. New England Worsted Company" in which Chief Justice Lemuel Shaw wrote "in order to amount to a nuisance, it is not necessary that the corruption of the atmosphere should be such as to be dangerous to health; it is sufficient that the effluvia are offensive to the senses and render habitation uncomfortable."[202] Manning proclaimed that the law was clear and the "remedies manifest … indict the owners (if they refuse to do what is right and proper) and knock their dam to smithereens instantly."[203]

[201] See Manning's letters to the *Lowell Mail*, July 25, 1894; July 27, 1894; July 31, 1894; August 1, 1894; and August 12, 1894. The Democratic *Lowell Sun* newspaper viewed "the great opponent of Hale's Brook," Jerome Manning, as often using the pollution problem as a means of attacking local Democratic politicians. See the *Lowell Sun*, "The Ward Dictum," April 30, 1895.

[202] Shaw quoted in Manning's letter to the *Lowell Mail*, July 27, 1894.

[203] "How to Abate the Hale's Brook Nuisance," *Lowell Mail*, July 27, 1894.

Butler vigorously opposed Manning and his proposal to remove the dam, and through his attorney he threatened to sue the city should it attempt any such action.[204] Although some officials in the municipal government and the Board of Health were possibly sympathetic to Manning's proposal, while at the same time they recoiled from his frequent barbs and abrasive personality, the city refused to take action against the Lowell Waste Company. Instead, local officials responded to municipal pollution problems by building more sewers in city streets and connecting them into larger intercepting sewers that dumped wastes into either the Concord or Merrimack rivers.[205]

Industrialists in Ayer's City

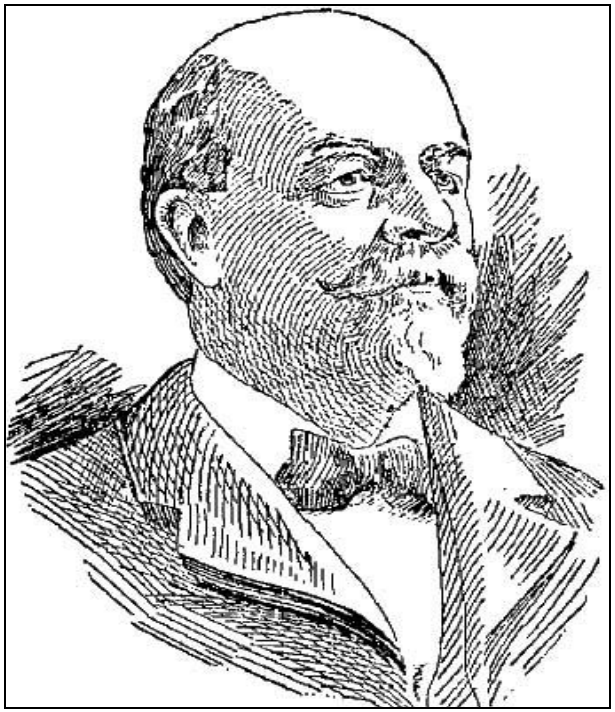
Manning's startling demand that mill and dam owners on River Meadow Brook should pay for the cost of alleviating the pollution problems seemed aim solely at Josiah Butler who owned the dam at Gorham Street and the adjacent cotton batting mill. Yet, Butler's small factory and dam, which originated with Moses Hales' mills in the late 18th century, had become by the 1890s one of several major industrial enterprises in the vicinity of the brook.

The largest of these were located along Tanner Street in Ayer's City with one of the most notable being the Coburn Shuttle Factory. Erected in 1882 at the corner of Tanner and Lincoln

[204] "Ward Three's Pest Hole," *Lowell Sun*, October 13, 1894.

[205] In 1895 the city's water department turned down Josiah Butler's offer to sell the city the water rights for River Meadow Brook for $40,000. See *Twenty-Third Annual Report of the Lowell Water Board and Reports of the Superintendent of Water Works and City Engineer*, 1895, (Lowell: 1896), p. 12.

streets, which was the location of the Hubbard & Blake tannery, the Coburn Shuttle Company's factory consisted of a three-story brick building, measuring 50 feet by 150 feet.[206] Adjacent to the brick structure was a three-story wood-frame factory, measuring 30 feet by 110 feet. These buildings were completed in the summer of 1882 and soon after the 70 horsepower Rollins steam engine and boilers were installed production commenced. The Coburn company manufactured a range of shuttles for cotton, woolen, and silk looms, as well as for jute. In addition, the firm produced bobbins and spools. The largely male workforce included between 40 and 50 employees.[207]



In the 1850s Earl Amri Thissell moved from his family's farm in New Hampshire to Lowell and initially worked in the Suffolk Mill's carpenter shop. After about three years he obtained a job at the Kitson Machine Shop and quickly emerged as a skilled mechanic. Thissell served in the Civil War and returned to Lowell where he became a business man. Over the next two decades he was associated with a number of manufacturing concerns, including Coburn Shuttle, Shaw Knitting, Lowell Hosiery, and Emerson Power Scale. This latter firm originated with sales of a weighing scale invented by James Emerson who had become well known for testing the efficiency of turbines, while working in Lowell and later Holyoke. Like Emerson, Thissell was an inventor who had gained technical knowledge in the workshop. He held nearly 20 patents for various textile and household inventions. Thissell died in 1918 at the age of 67. (Image from the *Lowell Sun*, August 16, 1904.)

[206] Born in Dracut in 1806, John H. Coburn moved to Lowell in the 1820s and learned the shuttle making trade while working for the Appleton Mills. He subsequently formed a partnership with John S. Jacques and for many years the two men manufactured bobbins, shuttles, and spools under the aegis of Coburn & Jacques. In 1866 John Coburn established his own shuttle manufacturing firm. The original factory was located on Dutton Street but the following year Coburn moved the operation across the Merrimack River to Centralville. In 1869 he sold the business to Henry W. Boardman, a Lowell lawyer, and Charles H. Morse, who ran the factory. The company retained the Coburn name. After only one year under Boardman and Morse, Coburn Shuttle was acquired by local capitalists Edwin Lamson and Earl A. Thissell with Lamson serving as company president. See Duane Hamilton Hurd, *History of Middlesex County, Massachusetts*, v. 2, (Philadelphia: 1890), p. 96. Lamson hired local builders to construct the factory. This included the O'Hearn Brothers for the foundation, Valentine Wilson for the carpentry (which involved erecting the interior heavy timber-fame and flooring), and Frank M. Merrill for the exterior brick walls. For information on the construction of the factory see a series of brief articles that appeared in the *Lowell Daily Courier*, January 28, 1882; January 31, 1882; and May 27, 1882.

[207] "Ayer City Enterprise," *Lowell Morning Times*, May 1, 1886.

The company's president Edwin Lamson, and his partner, Earl A. Thissell, emerged as two of the most powerful businessmen in Ayer's City. Unlike Thissell, who hailed from a successful farm family in Newbury, New Hampshire, Lamson was from more humble origins.[208] Born in Ipswich, Massachusetts, in 1833, Edwin Lamson moved with his family to Lowell where his parents ran a boardinghouse owned by the Lawrence Mills. The young Lamson received his education in the city's public schools after which he worked as a clerk in a hardware store and then in a grocery. Lamson also became involved in local politics in the late 1850s as a member of the fledging Republican party.

By 1861 he and a partner, John Rogers, were merchants in a flour business. Unlike Thissell, Lamson remained in Lowell throughout the Civil War and by the mid 1860s his prospering flour company included Warren C. Hamblet, a Dracut grain dealer, as a partner. Lamson remained in the flour-selling concern until 1869 when he and Thissell purchased the Coburn Shuttle Company. Lamson appears to have handled the sales and Thissell, who was a skilled mechanic and inventor, dealt with engineering and technical matters.[209]

In the 1870s and 1880s Thissell and Lamson won local elections and each served a number of terms on the city council. They also frequently petitioned the council for improvements to Ayer's City, where they purchased numerous parcels of land throughout the 1880s. These projects included a new and larger bridge carrying Lincoln Street over River Meadow Brook, the grading of London Street, and a sewer in the area of Lincoln and Tanner streets.[210] The two men also gained a measure of notoriety when they sued William H. Andrews, the owner of the Arey & Maddock tannery property, and the tannery proprietors for polluting the neighboring lots of land they owned.[211]

The factory buildings at the corner of Tanner and Lincoln streets housed other manufacturing firms as well as the Coburn Shuttle works. The top floor of the large four-story brick building, with a broad flat roof and a central stair tower on the Tanner Street façade, was occupied by the Haworth & Watson Paper Tube Company, producers of cop paper tubes that were increasingly used in the textile industry for holding yarn spun on ring or mule frames. The Pickering Knitting Company, manufacturers of underwear and gauze, occupied the second and third floors; and Coburn Shuttle had its operations on the first floor.

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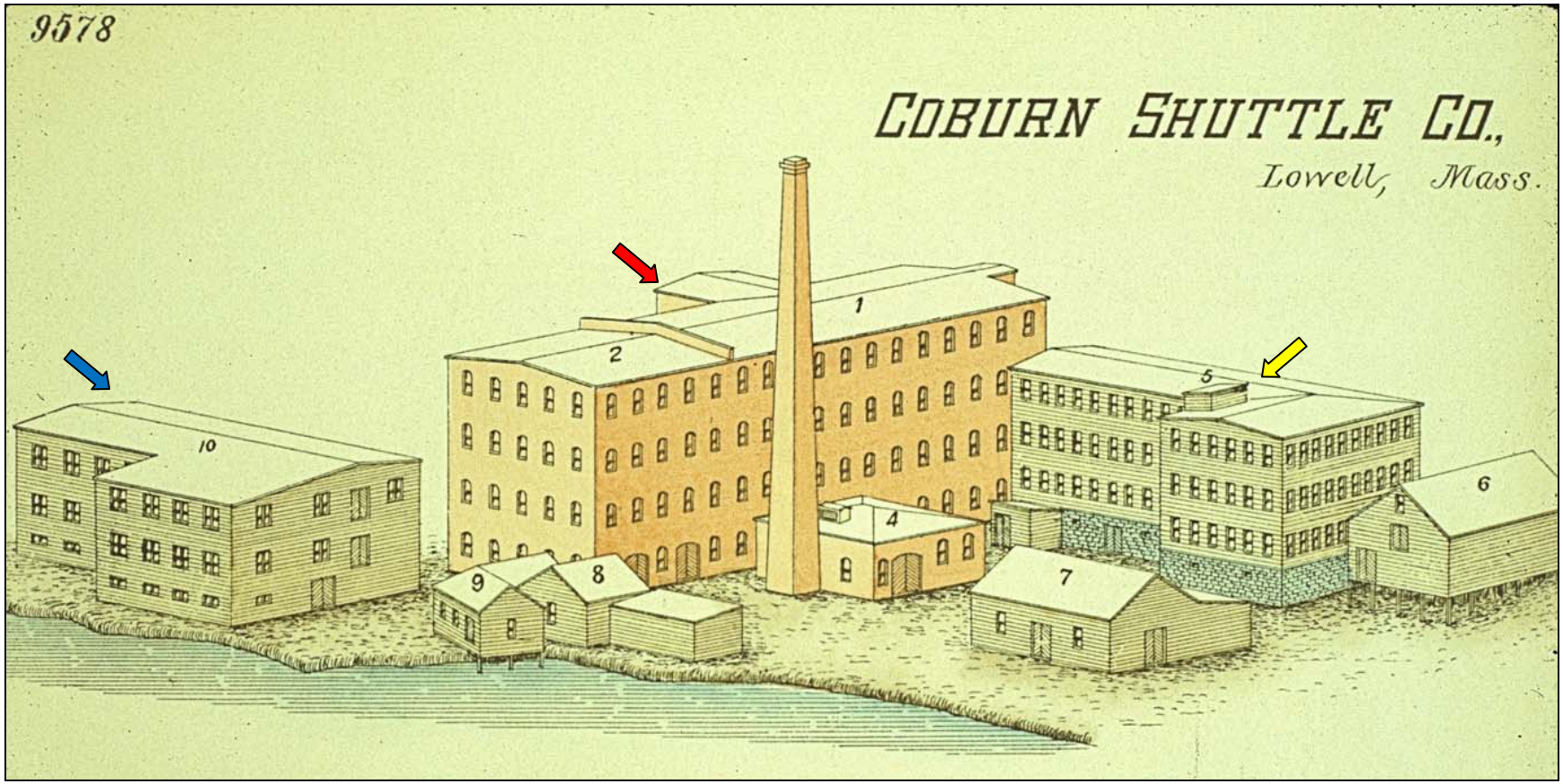
[208] An entry on the Thissell family appears in *Biographical Review, Vol. XXII, Containing Life Sketches of Leading Citizens of Sullivan and Merrimack Counties, New Hampshire*, (Boston: 1897), p. 188. This biographical sketch states that the Thissell family farm was in Newbury, New Hampshire. The federal census for 1850, however, indicates that Hiram Thissell, the father of Earl and four other sons, lived with his father, William, on a farm in Lempster, New Hampshire.

[209] There is little biographical information available on Lamson. See his obituary in the Lowell Courier, March 14, 1895, as well as the federal census for Lowell in 1850, 1860, 1870, and 1880. Also, see Lowell city directories for 1861, 1864, 1868, 1870, 1882, and 1892.

[210] "Large Number of Hearings on Petitions for Street Improvements," *Lowell Daily Courier*, July 10, 1886; "Street Hearings," *Lowell Daily Courier*, December 4, 1888;"Sewers Wanted," *Lowell Daily Courier*, April 10, 1891.

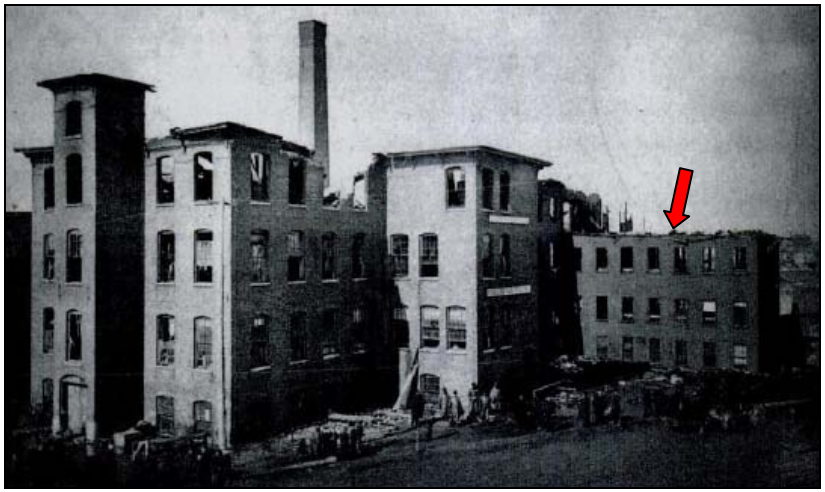
[211] "Who Owns This Land?" *Lowell Sun*, August 24, 1889.



This detail from an insurance map, dating from ca. 1885, shows the Coburn Shuttle Company's factory complex in relation to River Meadow Brook. The shuttle maker occupied part of the four story brick structure (red arrow) and the Sawyer Carriage Company manufactured various wagons, sleds, and light carriages in the wood-frame building (yellow arrow) on Tanner Street. Interestingly, this building had been the Coburn Shuttle Company's factory in the Centralville area of Lowell and was moved from across the Merrimack River to this location in Ayer's City. Two firms, including the Haworth & Watson Paper Tube Company, were tenants in the wood-frame factory (blue arrow) off Lincoln Street.

In addition to these concerns, the Sawyer Carriage Company occupied a three-story wood-frame building adjacent to the brick factory.[212] The proprietor, Thomas C. Sawyer, had begun producing carriages in a workshop on Middlesex Street in the 1850s.[213] His factory in Ayer's City employed about 15 men and included blacksmiths as well as carpenters and painters. They produced light carriages, sleds, rockaways, canopy-top beach wagons, and turries, but their specialty was the Goddard carriage. While the company sold its carriages at its Ayer's City factory, it also had a showroom on Middle Street in downtown Lowell.[214] Most transactions were likely carried out on Middle Street since the roads leading to the Ayer's City locality were often in poor condition especially during wet weather.

It was the "wretched condition of the roads" that contributed to the destruction from fire of Lamson and Thissell's factory buildings. The fire struck on wet and chilly March evening in 1888, originating in a blacksmith shop in the basement of the



In March, 1888, the fire that began in the blacksmith shop in the basement of the wood-frame ell (red arrow) of Lamson and Thissell's factory on Lincoln and Tanner streets, destroyed a great deal of the most substantial industrial building in Ayer's City. The two men rebuilt the structure the following year. (Photograph courtesy of Jason T. Strunk.)

wood-frame ell that was attached to the four-story brick factory. Despite the tin-covered heavy wooden doors at each floor between the ell and the brick building the flames quickly engulfed the entire factory. The rutted muddy roads leading to and along Lincoln Street made it difficult for the horse-drawn pumping apparatus of the fire department to reach the blaze. Eventually firemen, using two streamers, sprayed the buildings with water from the city hydrants, but to no avail. A large crowd gathered to witness the factory floors crashing down. By four in the morning, after nearly eight hours, the fire burned

[212] Interestingly, the building in which the Sawyer Carriage Company had its works was moved from Centralville, across the Merrimack River, and was the same structure Coburn Shuttle had used as its factory in this other location. See "The Sawyer Carriage Company, *Lowell Morning Times*, May 1, 1886.

[213] Sawyer's workshop in Lowell was one of two factories he owned. The other was located in Amesbury, Massachusetts, where Sawyer lived and where he began his carriage manufacturing business. Amesbury was the center of carriage production throughout much of the 19th century.

[214] Ads for Sawyer's carriages may be found in Lowell's newspapers in the 1870s; see, for example, *Lowell Daily Courier*, June 30, 1875. A brief article on the company was published in the *Boston Daily Advertiser*, September 8, 1888.

itself out.[215] Lamson and Thissell would rebuild the factory and continue to direct a number of industrial concerns in Ayer's City.

The Engle Crematory

That Ayer's City continued to be deprived of crucial municipal services was a common complaint among residents and industrialists in this section of Lowell. Even after the March fire the brigade on Tanner Street was still one of the few unpaid volunteer groups within the city's fire department.[216] In the fall of 1892, however, the municipal government bestowed on Ayer's City a sanitary facility that outraged residents in the vicinity of the brook. Located on Plain Street, this was a crematory for burning Lowell's garbage. Prior to this time, the city collected household wastes, namely "table refuse" and ashes, and carted the ashes to dumps while selling the other garbage to famers for swill.[217] Because of concerns of disease and as a result of numerous residents' complaints of noxious odors, the Board of Health decided to investigate other means for municipal garbage disposal.

After nearly two years of study, Dr. James B. Field, chairman of the Lowell Board of Health, recommended that the city contract with the Engle Sanitary and Cremation Company of Des Moines, Iowa, to build the first municipal garbage incinerator in Massachusetts.[218] The Board of Health chose the Ayer's City site believing, as Field claimed, that a garbage-burning facility "may be safely located in any place where a manufactory, or tannery, or anything else of that kind may be located." As for persons living or working in the area, Field also observed, "There may be some smell, but it will not be dangerous to health."[219]

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[215] This fire in Ayer's City received intensive local and national attention in newspapers. For the former, see especially "A Great Fire," *Lowell Daily Courier*, March 30, 1888; "A Great Blaze," *Lowell Sun*, March 30, 1888. For national coverage see "A Big Mill Destroyed," *The [New York] Evening Post*, March 30, 1888; "Large Fire Near Lowell," *[New York] Evening Telegram*, March 30, 1888. The *Courier* article reported on the difficulty of the fire department in reaching the fire. In all, nearly 500 women and men were thrown out of work due to the fire.

[216] "City Council," *Lowell Daily Courier*, May 23, 1888.

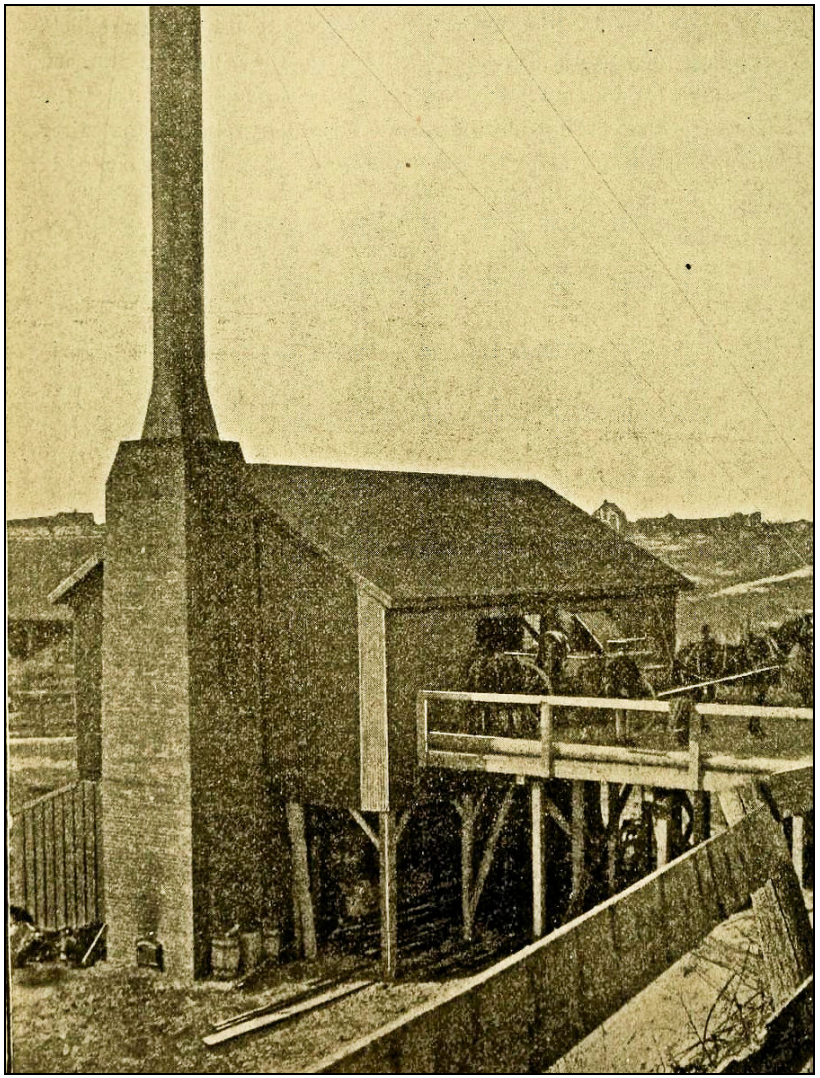
[217] The largest municipal dump at this time was located along Aiken Street in Centralville. The subject of numerous complaints, problems associated with the Aiken Street dump was the major reason the Board of Health sought to construct a garbage incinerator.

[218] The earliest large-scale garbage incinerators were developed in England in the 1870s and by the mid 1880s a number of Americans were designing and patenting similar kinds of refuse disposal technologies. See Martin V. Melosi, *Garbage in the Cities: Refuse, Reform, and the Environment*, (Pittsburgh, PA: 2005), pp. 38-40. One such designer was Andrew Engle, a farmer and inventor from Jasper County, Iowa. A former coal miner who was raised on a farm in Ohio, Engle developed garbage-burning furnace in 1877 and eight years later, at the age of 34, he patented a "Furnace for Night Soil." He formed the Engle Sanitary and Cremation Company in Des Moines, Illinois, and subsequently worked out a number of improvements to his original design.

[219] An 1884 graduate of Harvard Medical School, James B. Field moved to Lowell the following year and was physician and surgeon associated with the Lowell Hospital. Field served on the Board of Health for nine years and was chairman from 1888 to 1890 and again from 1893 to 1896. He was a staunch advocate of the Engle Cremator. See especially Lowell Board of Health, "Cremation of Garbage" in *Fifteenth Annual Report of the Board of Health of the City of Lowell, for the Year 1892*, pp. 26-38, published in *City*

Despite assurances of the Board of Health, a number of Ayer's City residents, led by William H. Penn, a foreman for one of Lowell's largest building contractors and owner of a house on London Street, two blocks from the crematory site, filed an injunction in the Superior Court of Massachusetts to halt the project. Judge John Hopkins ruled, however, that there was no nuisance since one had yet to be created.[220] Ready to resume construction in Ayer's City was the renowned sanitary engineer, William F. Morse, who served as agent for the Engle company. Under Morse's supervision the crematory was completed in about six weeks.[221]

Erected on a raised platform above the brick-constructed furnace, the crematory building was a narrow rectangular wood-frame structure, measuring 42 feet by 9.5 feet and 12.5 feet in height. It was sheathed in tin and contained a gable roof.



The Lowell Crematory in Ayer's City shortly after its construction in the fall of 1892. (Source: Lowell Board of Health Report for 1892.)

Documents of the City of Lowell, Massachusetts, for the Year 1892-1893, (Lowell, MA: 1893). The quote from Field is on p. 38.

[220] Judge Hopkins concluded the hearing by advising the petitioners that it would be better if they waited until the crematory was completed and if it then proved a nuisance they could sue the city for damages. See "The Crematory Hearing," *Lowell Sun*, October 1, 1892.

[221] An enthusiastic promoter of the Engle crematory, William Francis Morse served as the company's agent. Dr. Field and the Lowell Board of Health dealt solely with Morse throughout the work on the project. At about the same time the Lowell crematory was under construction, an Engle cremator was being built at the Chicago World's Fair. As Morse later observed, "[t]he Engle crematory reached its highest point of development at the World's Fair at Chicago in 1893, where two furnaces of this type destroyed all the garbage and sewage sludge resulting from the presence at the Fair grounds of over twenty-seven million persons during the six months of the Exposition." William F. Morse, "The Utilization and Disposal of Municipal Waste," Journal of the Franklin Institute, v. 158 (July, 1904), pp. 25-26.

The stack was 90 feet tall, the lower 30 feet being of brick construction and the remaining 60 feet of iron. Morse trained the city's refuse collectors in the operation of the crematory and in January, 1893, the incinerator began burning a large amount of Lowell's garbage. In fact, during its first year the Plain Street crematory burned 3,500 tons of swill and organic matter from households and city markets. In addition, workers incinerated four horses, 70 cats, 63 dogs, four hens, seven rabbits, and one raccoon. The crematory also burned 215 mattresses, as well as several barrels of clothing from small pox and diphtheria victims.[222]

While Dr. Field and other Board of Health members reported that they were highly pleased with the crematory's operation, William H. Penn, joined by several others, initiated another campaign to shut it down. To their list of nuisances connected to the crematory, they added one more: The risk of fire. (This stemmed from a small fire that occurred at a wagon manufacturing company's building across from the garbage incinerator that was sparked by embers which drifted out of the crematory smokestack.[223]) Compounding this fire risk was the practice of refuse collectors who burned paper and other articles on the ground outside the crematory, which was suddenly also serving as a garbage dump.

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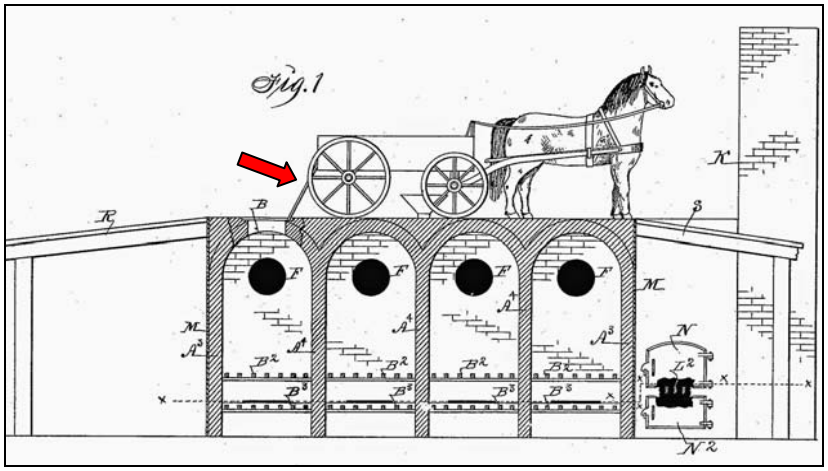


This drawing is from a patent titled "Apparatus for Destroying Garbage, Night Soil, &c." granted to Andrew Engle and Samuel C. Thompson in November, 1893. It shows the platform above the furnace on which animal-drawn carts, containing swill and solid garbage were unloaded (from the back of the cart) with the refuse falling into the furnace through an opening in the floor. An earlier version of this crematory was built in Lowell in 1892. (Source: U.S. Patent Office, Patent No. 508,511, Sheet 1 of 2, Patented Nov. 14, 1893.)

The petitions of Penn and his allies resulted in a series of hearings in the city council during the summer of 1893. The writings and testimony provided not only vivid descriptions of the crematory and the city's handling of refuse, but also of various conditions throughout the southern section of Ayer's City. Penn kept a diary in which he recorded the many repugnant smells and hazards that he and his family attributed to the crematory. He noticed "the greasy odor soon after it commenced running," and documented seven fires started by embers from the furnace. One such blaze struck "clothes

[222] *Sixteenth Annual Report of the Board of Health of the City of Lowell, for the Year 1893*, p. 17 in *City Documents of the City of Lowell, Massachusetts, for the Year 1893-1894*, (Lowell, MA: 1894).

[223] This fire to a storage building of the Sawyer Carriage Company caused minimal damage, but greatly alarmed residents in the vicinity of the crematory. See "Two Morning Fires," *Lowell Daily Courier*, April 1, 1893.

hanging on lines quite a distance [away]," while another started on a wooden platform at a mill building on the far end of Tanner Street. Olaf Olsson, a Swedish immigrant and blacksmith who was employed by the Sawyer Carriage Company and lived on Lincoln Street, stated that he was nauseated at work by the crematory odors and that the terrible stench was even worse at home. Another resident, Robert Payton, who worked at the carpet mills on Market Street and lived on Manchester Street, some 400 feet from the crematory, complained that his family had to close the windows at his residence when the wind blew from the crematory because the smell was overpowering. Payton believed that the furnace was "a great injury to health and property." He added that he found the city's Board of Health unresponsive to residents' concerns.[224]

As many as 100 families, nearly 300 people, lived within a few blocks of the crematory and frustration mounted over the perceived inaction of the Board of Health.[225] On a weekend in early September someone attempted to burn down the crematory, but a custodian at the site alerted the fire department and the blaze was extinguished with little damage.[226] Although the intensity of the opposition to the garbage incinerator tapered off, residents continued to complain. The Board of Health responded to a limited extent,

The crematory on Plain Street was built on property the city leased from the Conners Brothers Company, about a block-and-a-half from River Meadow Brook. (Source: City Atlas of Lowell, 1896)

[224] The testimony of Penn and Payton is found in "The Garbage Crematory," *Lowell Daily Courier*, July 27, 1893; and in "Offensive Crematory," *Lowell Morning Times*, July 27, 1893.

[225] The city did seek to address some of the problems. Under the aegis of the Board of Health, Morse returned to Lowell in August of 1893 to oversee improvements to the crematory. Workers added a damper to the stack to lessen fire danger to the neighborhood. In addition a second oil burner was installed in the upper chamber to do away with coal as a fuel. See "The Crematory," *Lowell Daily Courier*, August 17, 1893.

[226] "Opposed to Cremator," *Boston Globe*, September 4, 1893.

ordering, for example, a halt to burning swill during the winter months. This was partly an economic decision, however, since local farmers were willing to pay the city for swill to feed their livestock. In addition, the expense of running the crematory was more than the city council was willing to spend.[227] Yet the Board of Health continued to operate it during warmer seasons when objections were rampant especially among nearby dwellers who longed for cool, refreshing air in their homes. Instead, they were forced to shut their windows.

By 1900 the Board of Health ceased burning swill in the crematory and used the furnace only for incinerating market wastes, dead animals, and household debris.[228] Four years later city officials decided to retire it altogether, believing the crematory had outlived its usefulness.[229] Those who were relieved that they were finally rid of this nuisance, however, were perhaps dismayed not only with the news that the tannery of the Stead Tanning & Supply Company, was moving to the crematory site, but that the city was to construct another garbage incinerator a short distance up Plain Street. Installed in 1906, this crematory disposed primarily of market wastes, though it also burned animal carcasses, mattresses, and some hospital wastes. The city continued to operate it until 1912 when it was abandoned and the equipment was subsequently sold for scrap.[230]

The Driven Wells

The construction of the Engle crematory and the ensuing controversy over the city's burning of garbage in Ayer's City occurred nearly a year-and-a-half after Lowell's most dire public health crisis. This was the typhoid epidemic of 1890-91. Professor William T. Sedgwick, a biologist at the Massachusetts Institute of Technology, served as a consultant to the state Board of Health and traced the source of the typhoid outbreak to Lowell's municipal water supply, which drew water from the Merrimack River.[231] After months of

[227] *Eighteenth Annual Report of the Board of Health of the City of Lowell, for the Year 1895*, pp. 13-14, in *City Documents of the City of Lowell, Massachusetts, for the Year 1895-1896*, (Lowell, MA: 1896).

[228] *Twenty-Seventh Annual Report of the Board of Health of the City of Lowell, for the Year 1804*, pp. 61-62, in *City Documents of the City of Lowell, Massachusetts, for the Year 1904-1905*, (Lowell, MA: 1905).

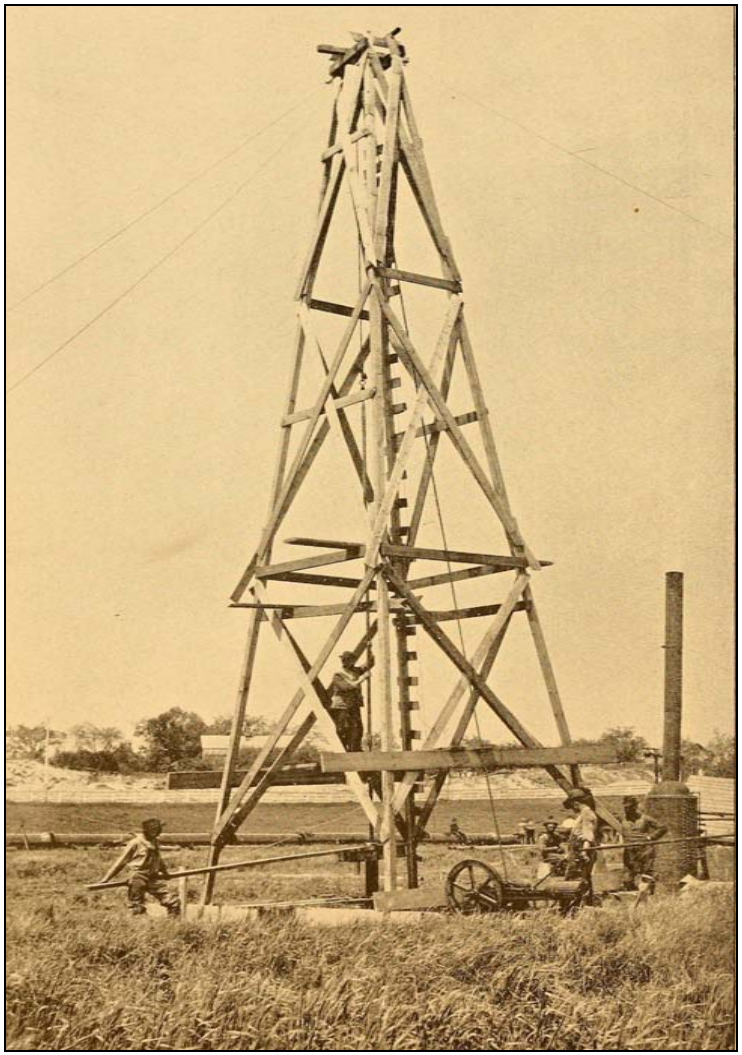
[229] "New Crematory," *Lowell Sun*, December 22, 1904. In 1905 the Board of Health wrote that the burning of swill in the crematory "was found to be very costly" and that this practice "was gradually discontinued until for the last four years all the swill has been sold to farmers as food for swine." See *Twenty-Seventh Annual Report of the Board of Health of the City of Lowell, for the Year 1904*, pp. 61, in *City Documents of the City of Lowell, Massachusetts, for the Year 1904-1905*, (Lowell, MA: 1905).

[230] Designed and built by Fred L. Decarie of the Decarie Manufacturing Company, Minneapolis, Minnesota, the new crematory cost the city about $10,000. The city operated the crematory on leased land from the Conners Brothers Company. See "Conners' Land," *Lowell Sun*, May 11, 1905. Also see *Twenty-Eighth Annual Report of the Board of Health of the City of Lowell, for the Year 1905*, p. 8, in *City Documents of the City of Lowell, Massachusetts, for the Year 1905-1906*, (Lowell, MA: 1906). The city council approved the scrapping of the abandoned crematory in the summer of 1914, more than two years after it shut down. "Clean-up Campaign," *Lowell Sun*, July 21, 1914.

[231] Prior to constructing the municipal water system, the city studied several potential sources one of which was River Meadow Brook. The city engineer wrote that "River Meadow Brook and Concord River are similar to Forge Pond in the general appearance of their waters, and in the character of their drainage area and water bed. They drain low meadows, their beds are

debate among local officials and Lowell residents, the city ceased using the river as its water source and shifted to a large-scale system of wells.[232] One set of driven wells was on the north side of the Merrimack River along the boulevard. They were called the boulevard wells. The other group of wells was located in the southern part of Lowell along River Meadow Brook.[233]

For the work along the brook, the city contracted with the Cook Well Company of St. Louis, Missouri, to construct a series of tube wells and provide all of the pipes, pumps, and other equipment necessary to supply Lowell with five-million gallons of ground water each day. In the late winter of 1893, workers began sinking test wells to determine substratum conditions and locations that yielded the largest volumes of water. The testing, which took over five weeks to complete,

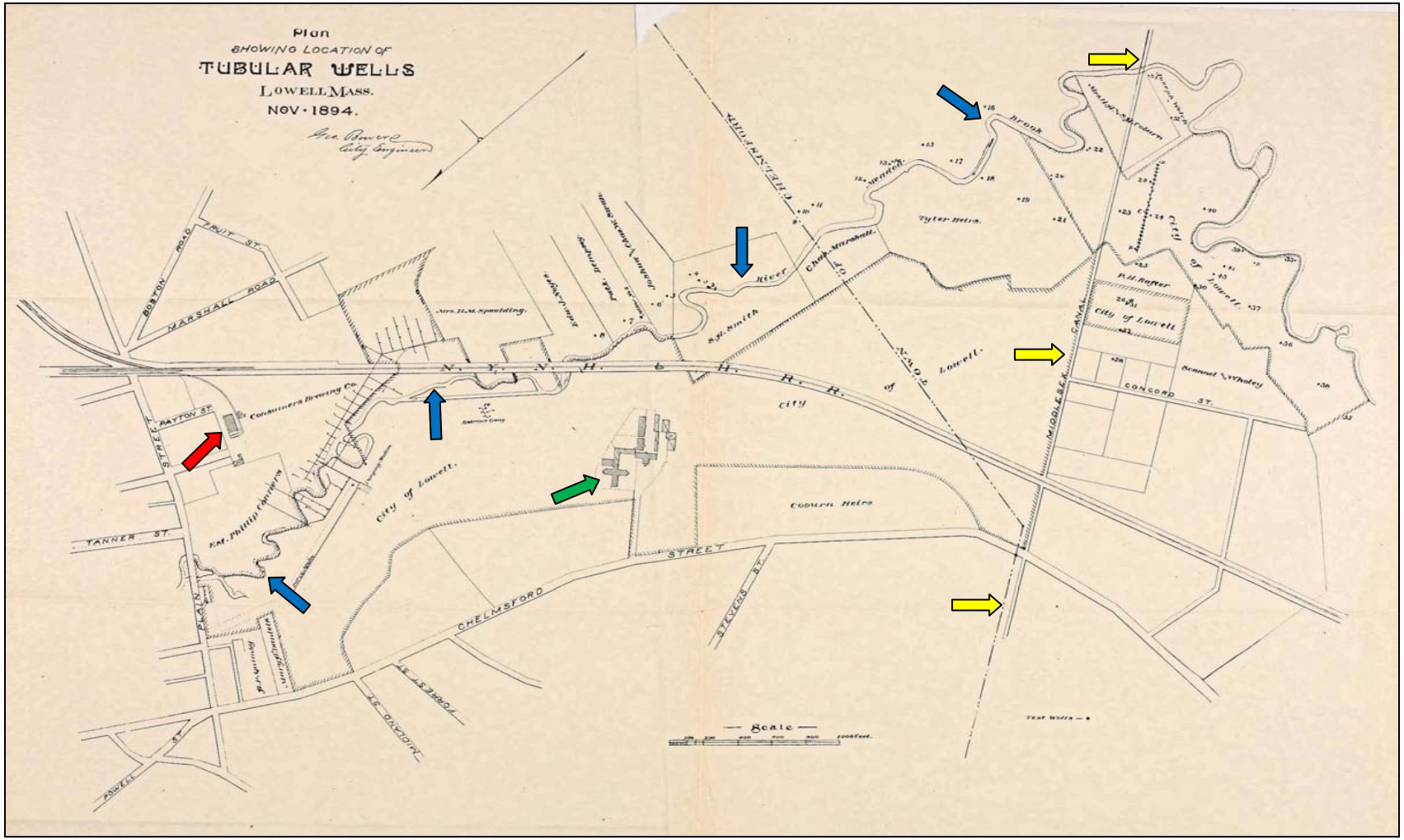


This image taken in 1893 shows Cook Well Company workers sinking one of the tube wells along River Meadow Brook. (Source: "Report of the City Engineer to the Lowell Water Board,"1894, p 89.)

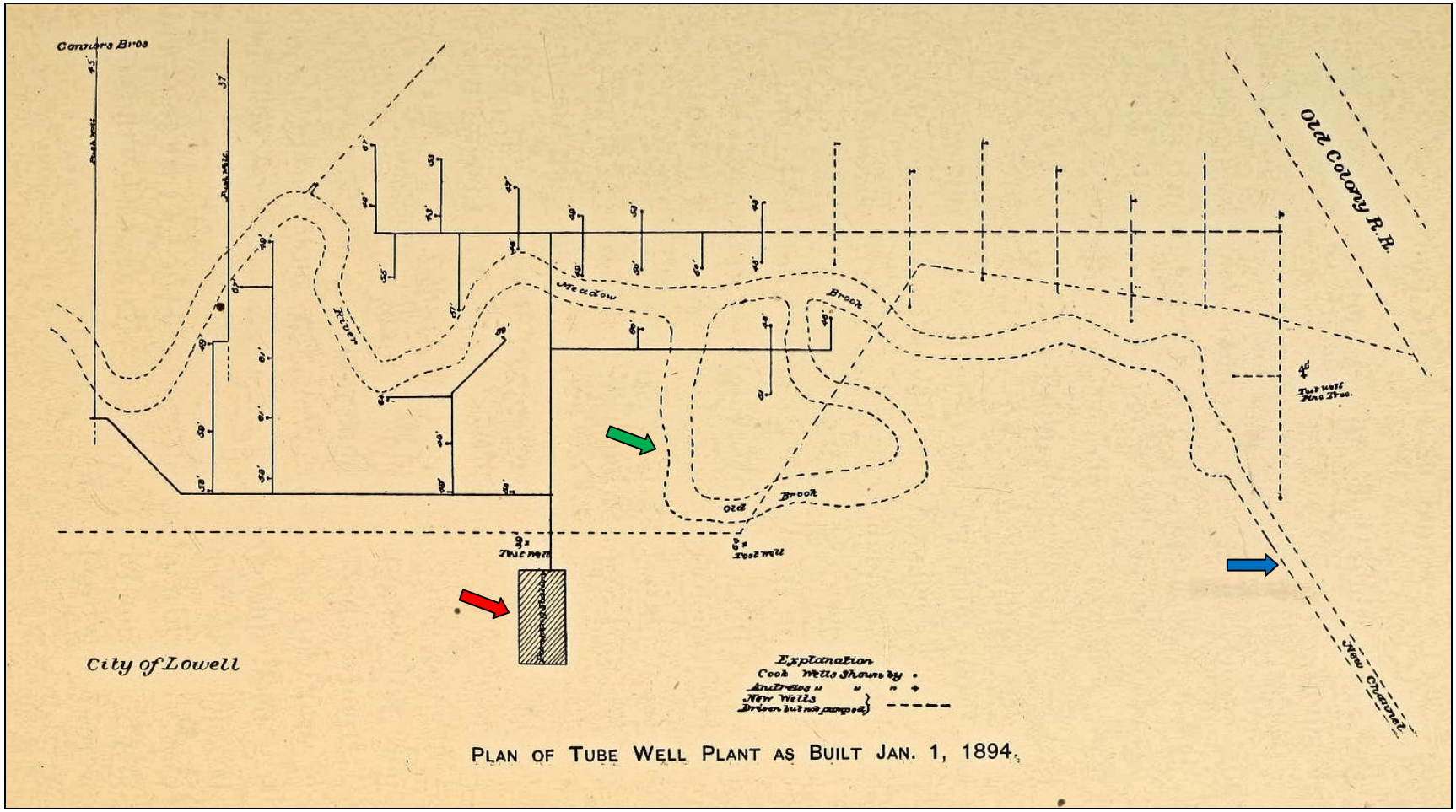
generally a soft vegetable deposit, clothed along the banks with vegetable growth, and the waters with sluggish motion have the appearance of containing a great amount of vegetable impurity." There is no mention of pollution from households or industrial plants. See "Report of the Joint Special Committee on a Supply of Water for the City of Lowell, September, 1869," (Lowell: 1869), pp. 23-24.

[232] Steinberg, *Nature Incorporated*, pp. 237-239.

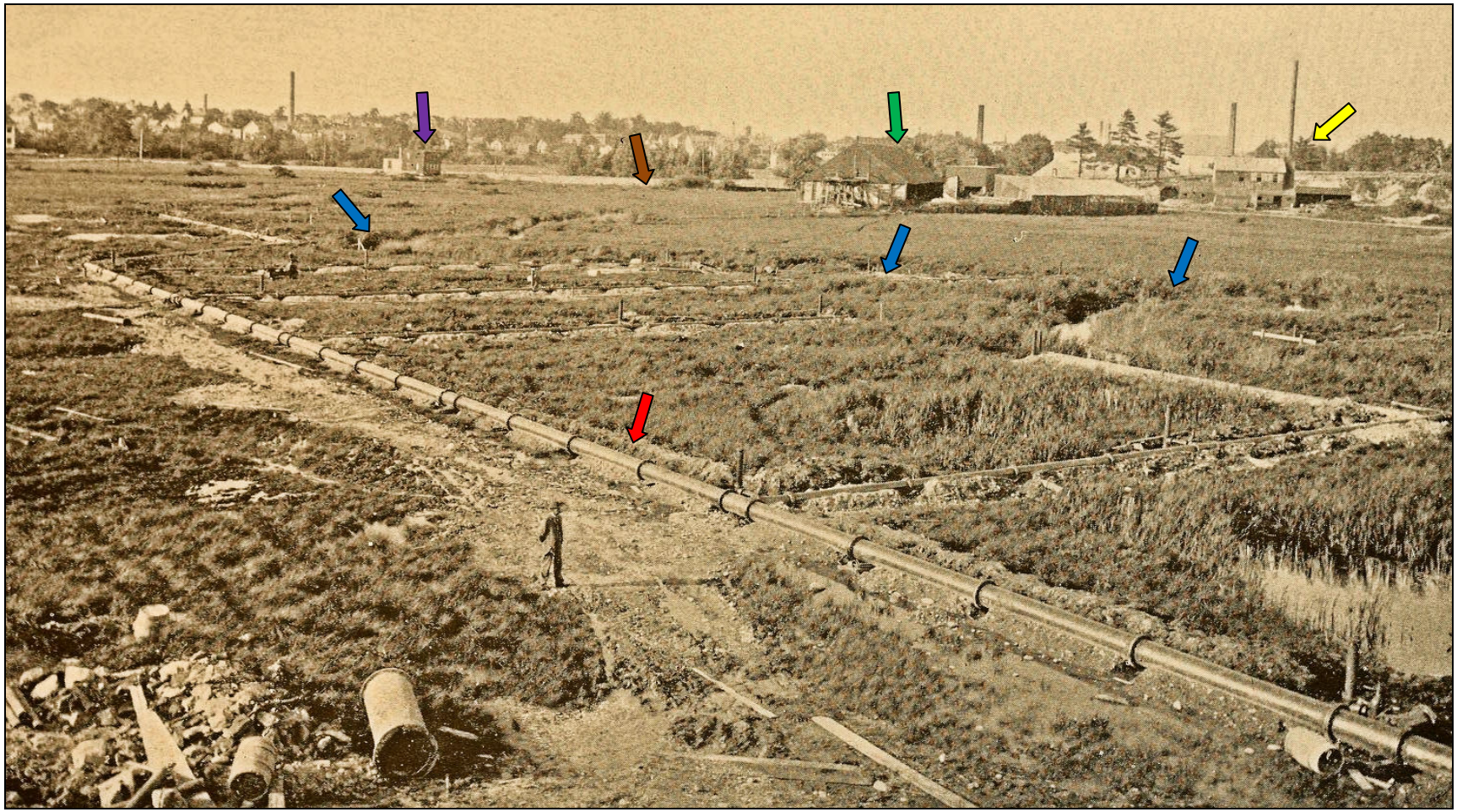
[233] In 1891 the city hired Delbert R. Barker, a contractor from Providence, Rhode Island, specializing in the construction of artesian wells, to investigate the boulevard area for a suitable well field. The following year the city awarded the bid to construct the boulevard wells to William Andrews Brothers Company of New York City. Work began on these wells at the same time the Cook Company was examining River Meadow Brook for another set of wells. See "Report of the City Engineer to the Lowell Water Board," published in *City Documents of the City of Lowell, Massachusetts, for the Year 1892-1893*, (Lowell, MA: 1893), pp. 83-84.



This map of the Cook well field shows not only the location of the tubular wells, but also the property owners and major roads along the brook (blue arrows). The Consumers Brewing Company (red arrow), soon renamed the Harvard Brewery, drew well water from this locale. Note, too, locations of the city's poor farm (green arrow) and the path (yellow arrows) of the long-abandoned Middlesex Canal. (Source: "Report of the City Engineer"1895, p 92.)



This plan of the network of Cook wells in the River Meadow Brook valley shows where the tube wells, 44 in number and placed within a half-dozen acre parcel of mostly city-owned land, were driven into the ground and connected by a series of pipes to the pump house (red arrow). Note that part of the stream bed of the brook was altered with the straightening of the channel to remove a small oxbow (green arrow) and create a new straight channel (blue arrow) along the Old Colony Railroad, which was formerly the Framingham & Lowell Railroad. (Source: "Report of the City Engineer to the Lowell Water Board,"1894, p 89.)



This photograph was taken in September, 1894, when construction of the Cook wells was completed in the River Meadow Brook valley in south Lowell. It shows the main pipe (red arrow) leading from the pump house to the connection with the main conduit of the city waterworks. Also visible are: (1) the serpentine channel of the brook (blue arrows) as it winds its way to (2) Plain Street (brown arrow); (3) the Lowell Crematory (yellow arrow), constructed in 1893 and used to burn the city's solid garbage and swill; (4) Malcolm D. Brown's dwelling (purple arrow), the lone residential building next to the brook on Plain Street; and (5) the Conners Brothers Company property (green arrow), which included stables, construction materials and the contractor's equipment storage buildings, and a coal yard. (Photograph from *Twenty-First Annual Report of the Lowell Water Board, 1894*.)

revealed significant flaws in the original concept of the well field produced by the city engineer. Most problematic was the poorly chosen well locations that were based on inadequate investigations of subsurface conditions. From his testing, Cook quickly realized that he would need to develop a new set of locations for the "permanent" wells. After Cook created a new design, work began in late April with completion of all 44 wells, connections, and pump house occurring in September.[234]

The wells varied in depth from 47 to 67 feet and all of the iron pipes were six inches in diameter. In each pipe was the Cook-patented filtering system to remove granular material and other impurities. Dating from the 1870s, the boilers and steam-driven pumping engines for pumping the water out of the ground were taken from the pumping station of the city waterworks and reused in the River Meadow Brook pump house. This wood frame building was constructed near the poor farm. The city was to pay the Cook Well Company about $24,000 for the work and materials, contingent on the five-million gallons of water yielded daily by the well field.

Although the initial water quality tests conducted by the state Board of Health determined the well water to be of excellent quality, the amount of water the well field provided the city amounted to two million gallons per day, less than half of that required by the contract. The Cook Well Company agreed to increase the number of wells and sank 15 more tube wells along the brook just over the Chelmsford line.[235] Even after additional work, however, the largest daily volume pumped was about 3.3 million gallons. Because the company held an investment in this well field and was unable to meet its contractual obligation, Henry F. Cook, president of the firm, decided to forfeit the contract. The city then agreed to purchase Cook's share of the pumping operation. Altogether the well field and pumping system cost the city a total of nearly $80,000.[236]

Lowell's growing population and the lack of a requisite amount of flow into the city waterworks from the Cook wells prompted the Lowell Water Board to expand the well field into Chelmsford. In 1894 the city contracted with the Hydraulic Construction Company of New York City to build a second tube well plant along the brook. Completed in early 1895, this

[234] Detailed information on the testing and construction of the Cook wells in 1893 is found in the "Report of the City Engineer to the Lowell Water Board," published in *City Documents of the City of Lowell, Massachusetts, for the Year 1893-1894*, (Lowell, MA: 1894), pp. 87-100. Also, see "The Driven Wells," *Lowell Daily Courier*, August 18, 1893.

[235] *Twenty-First Annual Report of the Lowell Water Board to the City Council of the City of Lowell, Massachusetts, 1894*, published in *City Documents of Lowell, Massachusetts, 1893-94*, (Lowell: 1894), pp. 8-12; "The New Driven Wells," *Lowell Sun*, January 12, 1895.

[236] Cook's company was about $10,000 in the red when the owner decided to give up the contract. Members of the Lowell Water Board believed Henry Cook to be reputable in his dealings with the city, but Cook had erred in the original design that had fewer wells than was needed to obtain the contractually required volume of water for the city. It was not until after the project was completed when Cook realized that additional and deeper tube wells were needed to increase the flow into the waterworks. To sink deeper wells would have required a complete redevelopment of the well field and the Water Board was unwilling to take such action. For a report on these difficulties see the *Twenty-Second Annual Report of the Lowell Water Board to the City Council of the City of Lowell, Massachusetts, 1895*, published in *City Documents of Lowell, Massachusetts, 1894-95*, (Lowell: 1895), especially pp. 8-9.

well field was built in two sections, each located in Chelmsford with connections to the main conduit leading to the city waterworks.[237] There were now a total of 120 wells along the brook and the city pumped about three million gallons of water per day from the River Meadow Brook well fields.

Despite the additional wells the amount of water obtained from the south Lowell and Chelmsford fields was still less than the volume that the city sought. This proved to be only one problem with from the new wells. Within a few years residents complained that municipal water had "an extremely disagreeable" taste and smell. City chemist, Thomas O. Allen, maintained that water from the wells contained "no bacteria to speak of" and he claimed that the Cook wells water was especially of good quality.[238]

Nonetheless, this unease continued for many years. One commonly voiced concern was the extremely cloudy water that poured from the taps of the many users of the municipal water supply.[239] But the most severe problem surfaced in 1899 when the Massachusetts Board of Health notified the Lowell Water Board that there were dangerously high levels of lead in the city's water. The state traced the source of this problem to the particularly large amounts of carbonic acid in the River Meadow Brook wells that reportedly corroded the many lead pipes that were used to connect households and other establishments to the main conduits, which were iron pipes that ran throughout the city.[240] Although the state Board of Health recommended against the use of the River Meadow Brook wells, the city frequently drew from this source when demand for water outstripped the capacity of the boulevard wells.

Over the years the city expanded and improved the wells in River Meadow Brook valley. By 1900 it operated 220 wells, which nearly equaled the number of wells along the boulevard. Gradually the city replaced lead with iron pipes and periodically upgraded its filtering plant to decrease turbidity and improve the quality of the well water. It directed most of the waterworks improvements to the boulevard wells, which by 1930 provided over 75 percent of Lowell's water supply. Water from the Cook wells was pumped directly into the reservoir on Christian Hill without any filtering.[241]

There were occasional conflicts between the city and private interests over the Cook wells operation, most notably in the

[237] The first section completed by the Hydraulic Construction Company consisted of 42 wells, each being two inches in diameter and each driven 45 feet deep into the ground. The second section contained 17 wells also of two inch diameter and 45 feet in depth. At this time the city also built another tube well plant at the boulevard. See "Report of the City Engineer to the Lowell Water Board," published in *City Documents of the City of Lowell, Massachusetts, for the Year 1895-1896*, (Lowell, MA: 1896), pp. 90-97

[238] "The Well Water, Not Dangerous to the Health It Is Said," *Lowell Sun*, July 20, 1897.

[239] For example, see "Many New Wells," *Lowell Sun*, November 9, 1909, in which the Robert J. Thomas, superintendent of the Lowell Waterworks, claimed that the turbidity in the water supply occurred when the pumps from the River Meadow Brook wells delivered this well water into city mains and created a strong current, which "roiled" the water and increased the amount of suspended material in the reservoir.

[240] "Danger Lurks, Lead Poisoning Menaces Lowell People," *Boston Globe*, July 2, 1899.

[241] "Well-Oiled System Supplies Daily Demand of Lowell for 5,000,000 Gallons of Water, "*Lowell Sun*, March 29, 1930.

early 1940s when the Harvard Brewery off Plain Street and users of the artesian wells along the brook, inveigled the city council to block a $65,000 loan for improving the Cook wells.[242] But the city continued to draw water from these wells and even relocated them in the wake of the Lowell Connector construction in 1960-61.[243]

With concerns over the inadequacies of the wells to provide Lowell with the needed amount and quality of water, the city hired two Boston-based engineering consulting firms, Metcalf & Eddy and Whitman & Howard, in 1960, to assess the condition of the existing water supply and recommend improvements to the system.[244] As a result of this work the city council voted to borrow $2.25 million for a new filtration plant to process water from the Merrimack River. The river would once again serve as the city's main source of water, about 70 years after its use was discontinued.[245]Although the wells in Chelmsford were used as an auxiliary source during periods of water shortages, the filtration plant was completed on the boulevard in 1962 and the river water flowed into the reservoir on Christian Hill.[246] At the same time and without any fanfare, the original Cook well field was obliterated by the Lowell Connector.

Contraction and Expansion

In the early 1890s when the municipal government was responding to growing public health problems and expanding city services through public works projects such as the Cook wells and the Crematory, Ayer's City residents experienced a number of dramatic changes to industries in their neighborhood. Most notable were the removal of the Pickering Knitting Company to another location in Lowell in 1891, and the closing of Arey & Maddock's tannery in 1892. Whereas Pickering Knitting had about 500 workers, the majority being young women, the tannery employed about 125 men, many of whom were immigrants from the Azores and Madeira Islands.[247] Some of the Portuguese-speaking tannery workers

[242] "$65,000 Water Dept. Loan Order Defeated in Council," *Lowell Sun*, May 5, 1943.

[243] "Work Starts on the Lowell Connector," *Lowell Sun*, October 9, 1960.

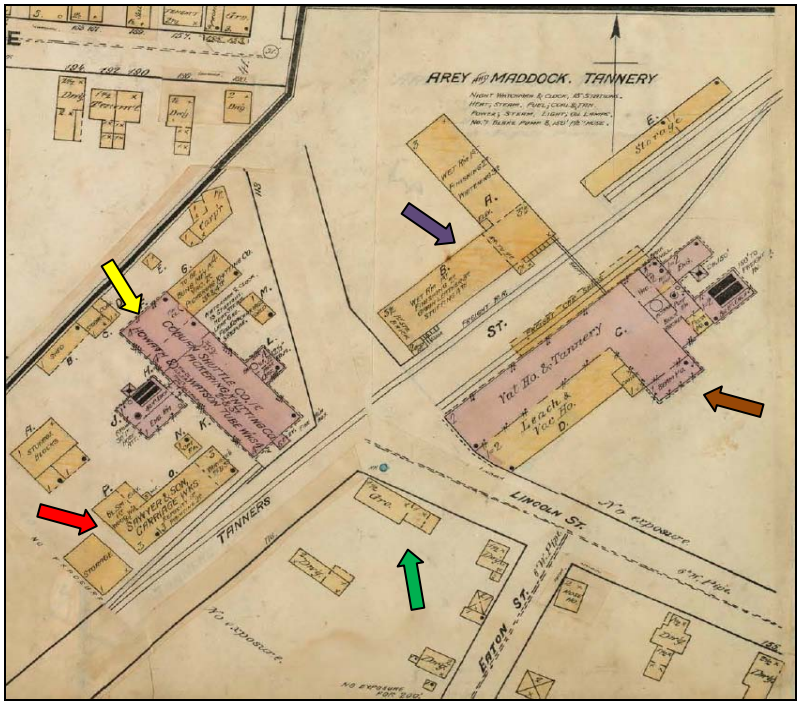
[244] Metcalf & Eddy conducted tests of the existing well fields and determined not only that the water quality was poor and contained high levels of iron and manganese, but it was also not going to meet the city's growing demand as a water supply. See "Merrimack Only Water Source," *Lowell Sun*, June 14, 1960; "New Treatment for Present Supply Would Cost $2,000,000," *Lowell Sun*, June 19, 1960; "Existing Well Fields Inadequate To Meet City's Present Day Needs," *Lowell Sun*, June 20, 1960; "Lowell Water Below Standard," *Lowell Sun*, June 22, 1960. For the design of the filtration plant see "Confer on New Water Plant," *Lowell Sun*, August 26, 1960.

[245] The city council acted relatively quickly in approving this loan. See "Council Passes Water Loan Order," *Lowell Sun*, July 27, 1960.

[246] "New Plant Ready for River Water," *Lowell Sun*, August 29, 1962.

[247] Pickering Knitting occupied part of the Coburn Shuttle Company's factory on Tanner and Lincoln streets. When the giant American Bobbin, Spool and Shuttle Company was formed in early 1891 and acquired the Coburn company, along with several other New England bobbin and shuttle makers, this new concern ended the lease of Pickering in the Ayer's City factory. As a result, James W. C. Pickering, the company's treasurer, decided to build a new factory on Middlesex Street in Lowell. Pickering hired Lowell architect Fred Stickney to design the large four-story brick building, which employed 200 workers shortly after it opened. See "The Bobbin Trust in Lowell," *Lowell Daily Courier*, February 11, 1891; "The City," in the *Lowell Daily Courier*, February 28 and June 12, 1891. A description of the new Pickering Mill is found in "Lowell," *Boston Globe*, April 10, 1891; and "Local News," *Lowell Sun*, April 18, 1891. The

lived in Ayer's City, though most lived in Lowell's "Back Central" neighborhood. Although work in the tannery was grueling its shutdown marked the end of one of the largest employers in Ayer's City.[248]



This detail from a Lowell city atlas, 1882, shows the Arey & Maddock Tannery (brown and purple arrows), which occupied both sides of Tanner Street. On the southwest corner of Tanner and Lincoln streets was the Coburn Shuttle Company (yellow arrow) and the Sawyer Carriage Company (red arrow). On the southeast corner, where the Criterion Knitting mill was constructed in 1888, were two wood-frame buildings. One was a grocery store (green arrow) and the other a dwelling. The large wood-frame tannery building (purple arrow), part of which served as the bark mill, was destroyed by fire in 1894, two years after it was abandoned by Arey & Maddock.

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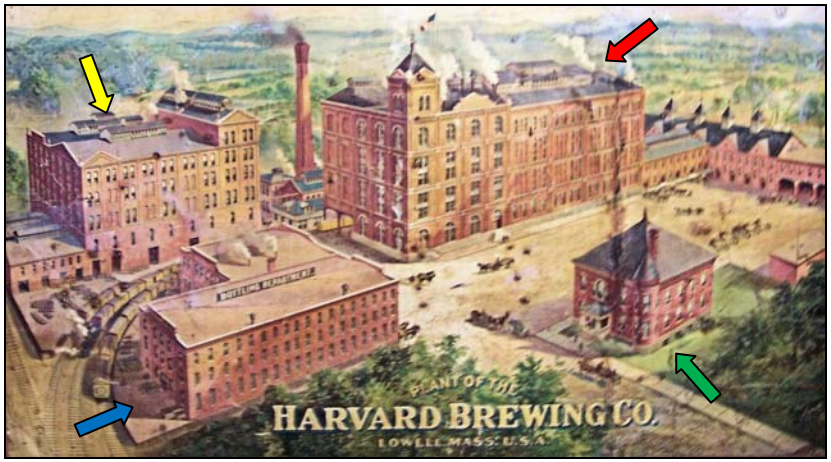
ethnicity of the Arey & Maddock tannery workers is noted in "Fires at Arey, Maddock & Locke's Tannery," *Lowell Daily Courier*, January 24, 1891.

[248] Throughout the 1880s the three major leather manufacturers in Lowell were Arey & Maddock, the White Brothers Company on Howe Street, and Josiah Gates & Sons on Dutton Street. In 1886 many of the Arey & Maddock tannery workers were members of the Knights of Labor and when they sought a wage increase in the June of that year, the company locked them out. Over the next several years Arey & Maddock hired larger numbers of Portuguese-speaking immigrants. While neither of the partners in the firm lived in Lowell—Reuben Arey resided in Cambridge and George H. Maddock was a Wakefield resident—Edwin Arey, younger brother of Reuben, was the company's bookkeeper and owned a house on South Walker Street. Shortly after Reuben Arey's death in July, 1892, the company announced it was closing its Lowell tannery and shifting its operations to a tannery in St. Regis Falls, New York. Maddock was later one of the incorporators of the Regis Tannery in Saco, Maine. For information on the lockout Lowell see "Lockout at Arey & Maddock's Tannery, *Lowell Daily Courier*, June 11, 1886. For the closing of the Lowell tannery see "Death of Reuben Arey," *Boston Globe*, July 8, 1892; "The St. Regis Leather Company Will Establish Their Finishing Works Here," *The Adirondack News*, July 2, 1892;"The City," *Lowell Daily Courier*, August 12, 1892. It was George Maddock who decided to close the Lowell tannery and acquire the St. Regis Fall property, but it is not clear as to his reasons for this action. Competition from Southern tanneries was on the rise by the early 1890s and shifting the operation to northern New York might have saved on labor costs and the costs of transporting bark for the production of tannin. See "Dry Days in the Leather Trade of New England, *Boston Globe*, May 12, 1892. Ten years after taking over the St. Regis Falls tannery the company was insolvent. "Leather Markets Surprised," *Boston Globe*, January 25, 1902. The large wood-frame building on the west side of Tanner Street, which was purchased by cop tube manufacturers Haworth & Watson, was destroyed by fire in late 1894. See "Saturday Night's Fire," *Lowell Mail*, December 17, 1894.

Life for many working people became even more of a struggle as a result of the Panic of 1893, the nation's most severe economic depression since 1873, which hit especially hard the textile industry. In Lowell and other New England textile cities, the mills cut wages and reduced the hours of labor.[249] For two months in the late summer and early fall of 1893, the Criterion Knitting Mill shut down, throwing some 80 women out of work. Across the brook from Ayer's City at the poor farm, the superintendent, Cornelius E. Collins, reported that the number of applicants seeking assistance was one-third greater in late 1893 than the same time one year earlier. By the summer of 1894, the poor farm was overwhelmed with more than 450 inmates.[250]

Although the Panic of 1893 resulted in hard times for working people in Lowell and other cities, some manufacturing concerns weathered the economic depression with greater success than the textile and boot and shoe industries. In Ayer's



This bird's-eye view of the Harvard Brewery, originally the Consumers Brewing Company, is looking southwest beyond River Meadow Brook. It dates from ca. 1910 and shows the original main brew house (red arrow) that produced lager beer, the ale brew house (yellow arrow), erected ca. 1899, the bottling plant (blue arrow), erected in 1909, and the office (green arrow), which was located on Payton Street. The tall brick chimney and boiler house were also built in 1909. To the right of the main brew house are the company's stables for the horses that pulled the brewery wagons. Of these early buildings only two-stories of the ale house remains standing today. (Bird's-eye view from Vintage Beer Collectibles.)

City smoke continued to billow from the several foundries along Tanner Street and a new firm, the Consumers Brewing Company was incorporated in 1893. Initially John Joyce and Maurice J. Curran, brewers and wholesale liquor dealers in Lawrence, Massachusetts, led the company. In addition to these two men, the incorporators included former Lowell mayor John J. Donovan and John H. Coffey a Lowell provision dealer. All of these men were either born in Ireland or were of

[249] The cut downs began in the fall of 1893 and continued into 1894. Workers struck at several mills, most notably at the Lowell Carpet Mills, as well as the Faulkner Mills and Stott's Mills on the Concord River. See "Labor News," *Lowell Sun*, September 25, 1893; "Cut Down," *Lowell Sun*, January 2, 1894; "Labor Troubles," *Lowell Sun*, May 4, 1894.

[250] "Next Monday, after Two Months' Shutdown, the Mill Starts," *Boston Globe*, November 1, 1893. The misery of many unemployed textile and other workers rise worsened in the fall of 1893 when boardinghouse keepers evicted large numbers of women and men who were unable to pay for their room and board. See "Condition of the Unemployed," *Lowell Sun*, December 19, 1893. Also, see "Poor Farm," *Lowell Sun*, August 1, 1894. The growing number of "tramps" in the city was also observed and the "tramp nuisance" received a great deal of attention in 1893-94. See, for example, "Tramps Abroad," *Lowell Sun*, October 30, 1893.

Irish Catholic parentage. Opened in April, 1894, the brewery was constructed off Plain Street and drew water from artesian wells, which were part of the same aquifer that supplied the Cook wells with water.[251] Four years later Ward B. Holloway and Richard C. Hemman, who managed the East Coast interests of the Rochester Brewing Company in Boston, acquired control of Consumers, reorganized the firm, and changed its name to the Harvard Brewing Company.[252]

From its inception, the brewery hired primarily Irishmen, Irish Americans, and German workers. The workforce numbered about 100 men and for years German immigrants held the most important position of brew master. Many of these highly skilled brewers and their fellow countrymen settled in or near Ayer's City.[253] By 1914 the German community was large enough that a German club, established a decade earlier in Lowell, had sufficient membership to fund the construction of a Deutsche Halle on Plain Street.[254] One brew master, Gottlob Thumm, who worked at Harvard Brewery from 1905 until his death in 1919, was especially active in promoting German culture.[255]

In its early years the company dumped brewery effluent into River Meadow Brook through an open ditch it constructed

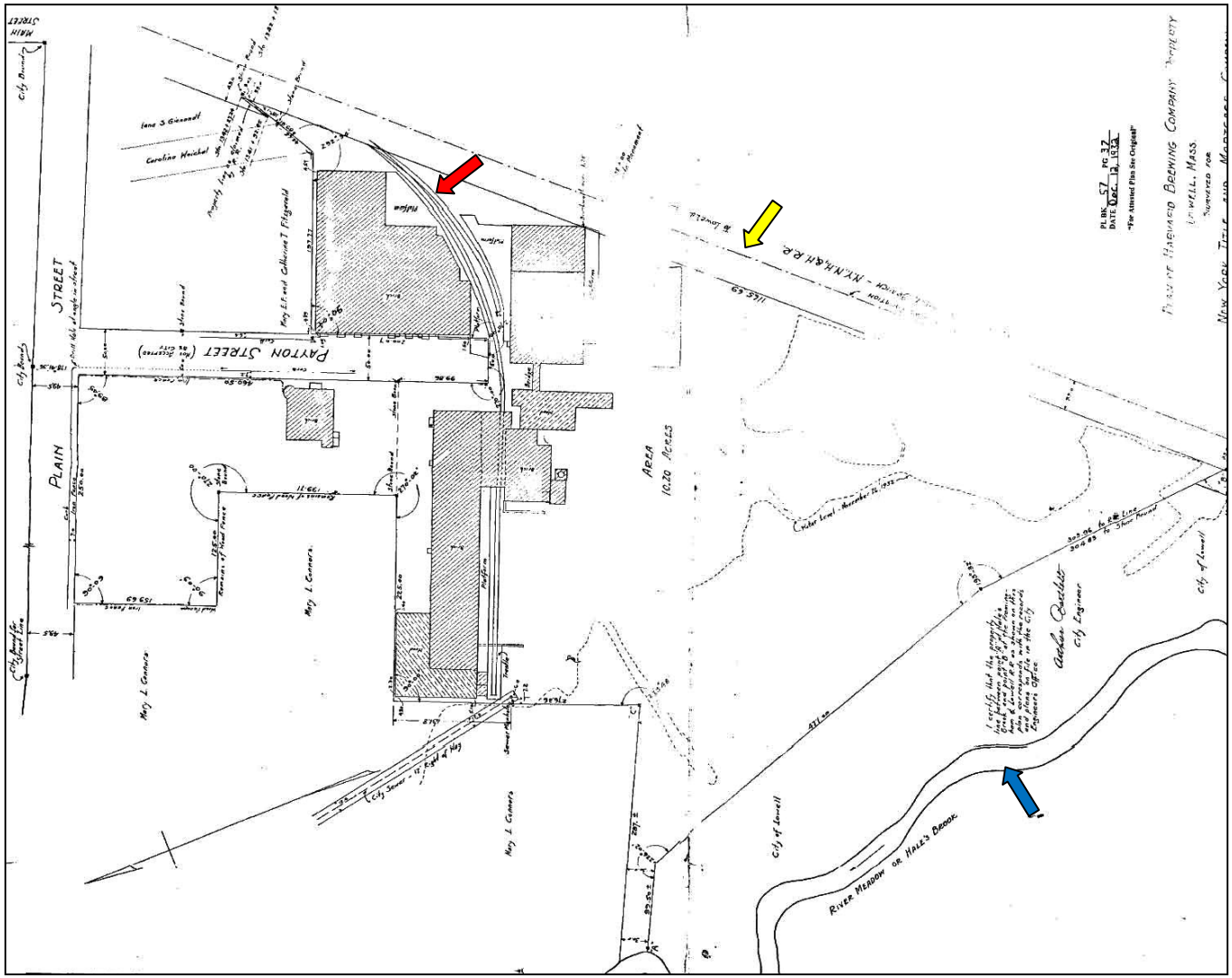
[251] The Consumers Brewing Company built the first major brewery in Lowell since the 1820s

[252] For a brief history of the brewery see Mehmed Ali, "The Harvard Brewing Company," exhibit brochure, (1995), at the Center for Lowell History. Also, see "Brewery Organized," *Lowell Daily Courier*," March 15, 1893, which identifies the founders of the Consumer Brewing Company, that was incorporated with a capital of $300,000. The brewery construction began in May, 1893, with locals Patrick O'Hearn contracted for the foundation and Bennett & Conlon hired for erecting the buildings. See "Building," *Lowell Daily Courier*, August 23, 1893. By purchasing a majority of stock in 1897 or early 1898, Holloway and Hemman gained a controlling interest in Consumers. John Joyce was retained as president, but Holloway ousted John H. Coffey and took over as the Harvard Brewing Company's secretary and treasurer. "Brewery Change," *Lowell Sun*, January 25, 1898; "Brewery Meeting," *Lowell Sun*, January 27, 1898. In poor health, Joyce died shortly thereafter. He was just 39 years old. "J. H. Coffey Died at Noon," *Lowell Sun*, September 2, 1898. Holloway, an energetic and shrewd businessman who helped King C. Gillette, the famous safety razor inventor, organize his company in Boston, directed the Harvard Brewery for the next ten years. During Holloway's tenure the Harvard Brewing Company prospered, but it was implicated in local scandal and corruption involving the control of beer sales and liquor licensing in Lowell. In 1906 he and other company officials were indicted and tried on charges of conspiracy in the issuing of liquor licenses. A jury at the trial in the Superior Court in Cambridge, Massachusetts, acquitted Holloway, Richard Hemman, John Joyce, and two Lowell police commissioners. This case was reported in various New England newspapers. See, for example, "Not Guilty," *Lewiston [Maine] Evening Journal*, December 17, 1906. Suffering from poor health, Holloway died in Santa Barbara, California in 1909. He was nearly 47 years old. "W. B. Holloway," *Lowell Sun*, January 5, 1909.

[253] The earliest brew masters were all born in Germany. This included Louis Wentzler, Charles Rupprecht, Carl Grundler, and Gottlob Thumm. Harvard Brewery workers belonged to the United Brewery Workers Union, Local No. 90, the early leadership of which was dominated by Irish Americans. See, for example, the list of union officers in the Lowell city directory for 1905, p. 47.

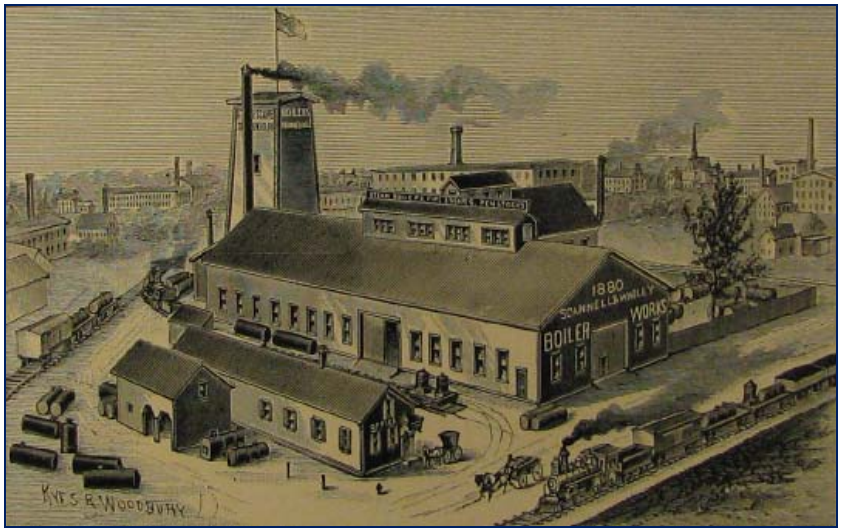
[254] "New German Clubhouse," *Lowell Sun*, October 24, 1914. Currently, on the Plain Street site of the German Club is the social hall of the Veterans of Foreign Wars, Post 2597.

[255] Thumm was also a vice president of the New England Brewmasters' Association and an inventor who patented a carbonation device for beer. See "New Patents," *American Brewers' Review*, v. 14 (August, 1914), p. 396; and his obituary, *Lowell Sun*, September 8, 1919.



Drawn by the New York, New Haven & Hartford RR in 1932 this plan shows the buildings of the Harvard Brewery in relation to River Meadow Brook (blue arrow). The railroad right-of-way is shown (yellow arrow) passing along the east side of the brewery with a spur line (red arrow) that extended by the brew houses and into the plant. (Plan, dated December 12, 1932, from the Northern Middlesex Registry of Deeds, Book 57, p. 37.)

from the brewery property to the stream. The committee on sewers and the Board of Health recommended ending this practice by constructing an extension of the Tanner Street sewer to the brewery. For several years, however, the city failed to appropriate funds to build this sewer. In 1898 the Board of Health declared that the "nuisance caused by the draining of [wastes] from the Harvard Brewing Company's brewery … has become exceedingly offensive and dangerous to the public health."[256] Amid controversy because of private consultations between brewery officials, the city engineer, and a select group of property owners in Ayer's City, the committee on sewers chose a route from the brewery to the Tanner Street sewer and this line was completed 1898.[257]



This engraving of the Scannell & Wholey Boiler Works dates from the 1880s and highlights the company's sign, "1880, Scannell & Wholey, Boiler Works, at the gable end of the main fabricating building. The view is toward the southeast from Tanner Street, along which a steam locomotive is depicted in motion. The tall wood-frame structure to the rear, with an American flag on top, was noted as a store house on an 1892 city atlas. Steel penstocks that boilermakers fabricated in the shop and readied for shipping may be seen in the lower left. Note the lone tree in the fenced-in "courtyard" that extends along Tanner and St. Hyacinth streets. (Source: *Lowell Mail Souvenir*, 1890).

Ayer's City Iron Industry

While the Harvard Brewing Company and the Lowell Bleachery were the largest single users of water and produced the largest amounts of effluent of any single manufacturer in Ayer's City, other industries in this locale drew from River Meadow Brook for boiler water needed to power steam

[256] "Hale's Brook Nuisance," *Lowell Sun*, July 26, 1898

[257] The sewer extension, which lengthened the Tanner Street sewer line by about 640 feet and connected it to the brewery, cost over $800. *Auditors Sixty-Third Annual Report of the Receipts and Expenditures of the City of Lowell, 1898*, Mass., p. 283, published in published in *City Documents of Lowell, Massachusetts, 1898-99*, (Lowell: 1899). A Lowell newspaperman who asked the participants about the need for "secrecy" in the private meetings about the sewer route, subsequently observed that "Mr. [John C.] Burke shrugged his shoulders [and] the brewery man looked wise, while E. Garfield [Baker, an attorney] gave me one of those looks which a tired parent generally bestows upon a son when the latter has asked him why some men are born in luck and others are born in Lawrence." This was the first in series of charges made against brewery officials that they exerted undue influence over the city government. See "That Brewery Matter," *Lowell Sun*, August 16, 1898. These charges became evermore serious in the early 1900s and culminated in the indictment and trial of two Lowell police commissioners and Harvard Brewery men concerning liquor licensing and control of beer sales in the Spindle City.

engines.[258] In fact, two firms, Scannell & Wholey and Richard Dobbins' Lowell Steam Boiler Works, located on opposite sides of Tanner Street, were the city's leading producers of steam boilers and penstocks. The emergence of these two boiler works in Ayer's City was part of a wave of heavy industrialization in this area in the early 1880s. The two companies were also fierce competitors and the principals behind each enterprise, although all born in Ireland, were markedly different in their ethnic-cultural backgrounds.

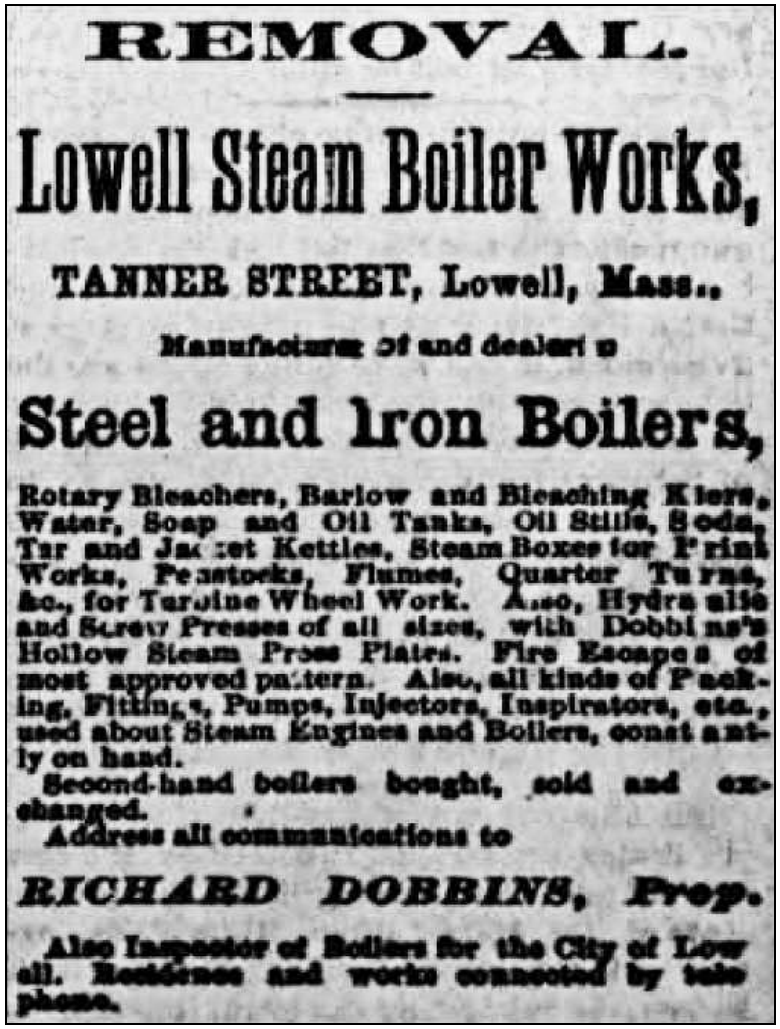
Richard Dobbins was associated with one of Lowell's earliest boiler works that was independent from the massive Lowell Machine Shop. His father-in-law, English immigrant Joseph D. Ashton, settled in the city in 1840 and worked as a highly skilled boiler maker in the fabrication of railroad locomotive boilers at the Machine Shop. Ashton's older brother Stephen superintended this department. In 1854, after the Lowell Machine Shop ceased manufacturing locomotives, Stephen Ashton established the Lowell Boiler Works on Dutton Street and five years later Joseph succeeded him as proprietor of the firm.[259] At this time William Dobbins, about 20 years of age and the older brother of Richard, began working as a boiler maker at the Ashton-led boiler works. By 1861 Richard was also working at the Lowell Boiler Works and in May of that year, just weeks after the battle at Fort Sumter which marked the beginning of the Civil War, he enlisted as a private in the Union Army. Dobbins suffered a serious wound at the battle of Cedar Mountain, but recovered and returned home a sergeant in 1863.[260]

William Dobbins remained in Lowell during the Civil War and became the proprietor of the Lowell Boiler Works, although his father-in-law continued to be involved in the business. His younger brothers Richard and George joined him after they were mustered out of the army. Although all of the Dobbins brothers were born in Ireland, they were of Scots-Irish descent

[258] The use of River Meadow Brook for boiler water began to change to some extent in the early to mid-1880s when the city agreed to extend the main water line of the municipal water supply along Tanner Street. See, for example, a report of the Lowell Water Board's decision to take this action in "City Items," *Lowell Weekly Sun*, September 9, 1882.

[259] Around 1830, when the 30-year-old Stephen Ashton immigrated to the United States he lived in New York City where he found employment as a boiler maker. He married there before he was recruited in 1834 to direct the manufacture of locomotives at the Lowell Machine Shop. Joseph Ashton, 18 years younger than Stephen, appears to have emigrated from England expressly to work for his brother in the Machine Shop. When locomotive production ceased Joseph moved to Chicopee, Massachusetts, where he established a small boiler works factory. He returned to Lowell in 1859 and took charge of the Lowell Boiler Works. Stephen Ashton departed Lowell and returned to New York City. Joseph Ashton remained in Lowell and eventually retired from the boiler works. He died in 1884 at the home of his son-in-law and daughter. See "Boiler Making in Lowell," *Lowell Daily Courier*, February 13, 1882; Joseph D. Ashton's obituary in the *Lowell Daily Courier*, March 24, 1884; the entry for the Lowell Boiler Works in *Webb's New England Railway and Manufacturers Statistical Gazetteer*, (Providence, RI: 1869), p. 288; and city directories for Lowell.

[260] Richard Dobbins younger brother George also enlisted in the Union Army and they both served in the same regiment. The battle of Cedar Mountain occurred in Virginia in August 1862. Among the casualties was another employee of the Lowell Boiler Works, 22-year old John Stevens, whose father also worked for Ashton. Dobbins recovered from his wound in a Washington, D.C., hospital. See "Dangerously Ill," *Lowell Daily Courier*, September 25, 1862; "Three More Soldiers Dead," *Lowell Daily Courier*, September 10, 1862.



REMOVAL.

Lowell Steam Boiler Works,

TANNER STREET, Lowell, Mass.,

Manufacturers of and dealers in

Steel and Iron Boilers,

Rotary Bleachers, Barlow and Bleaching Kiers, Water, Soap and Oil Tanks, Oil Stills, Soda, Tar and Jacket Kettles, Steam Boxes for Print Works, Penstocks, Flumes, Quarter Turns, &c., for Turbine Wheel Work. Also, Hydraulic and Screw Presses of all sizes, with Dobbins's Hollow Steam Press Plates. Fire Escapes of most approved pattern. Also, all kinds of Packing, Fittings, Pumps, Injectors, Inspirators, etc., used about Steam Engines and Boilers, constantly on hand.

Second-hand boilers bought, sold and exchanged.

Address all communications to

RICHARD DOBBINS, Prop.

Also Inspector of Boilers for the City of Lowell. Residence and works connected by telephone.

This ad in a Lowell newspaper appeared several months after Richard Dobbins relocated his boiler works to Ayer's City. Note the variety of iron and steel products manufactured at the factory along River Meadow Brook. (Source: *Lowell Daily Courier*, July 5, 1882.)

and they were Protestants. William became active in Republican party politics in Lowell and won elective office, twice in the common council and once as an alderman.[261] It was while serving as a Republican alderman and running his boiler works that William Dobbins was killed in a horrific accident in 1873. Dobbins was at a downtown Lowell factory helping to set in place a new boiler when the supporting frame shifted and the boiler toppled over, crushing and killing him instantly.[262] For a brief time after Dobbins' death, Charles Cowley, a Lowell lawyer who purchased the boiler works from Elizabeth Dobbins, Williams' widow and the administratrix of the estate, ran the company. The Panic of 1873 and ensuing economic depression led to hard times for many Lowell businesses, including the boiler works. After losing money for more than two years, Cowley withdrew and Richard Dobbins assumed control in 1876.[263]

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[261] William Dobbins served in the common council in 1867 and 1871. He won election as an alderman in 1872. Dobbins aligned himself with Benjamin Butler and other Radical Republicans in Lowell. He was a member of the Ten Hour League that aimed to pass legislation in Massachusetts reducing the working day to ten hours, which he observed at his boiler works. His involvement in the League is noted in "The Ten Hour Rally," *Lowell Daily Courier*, August 7, 1873.

[262] "Sad and Fatal Accident," *Lowell Daily Citizen & News*, August 7, 1873.

[263] Adding to the financial difficulties was a destructive fire at the boiler works in late 1874 which resulted in a loss of nearly $4,000. "Fire at Lowell Boiler Works," *Lowell Daily Courier*, December 7, 1874. The property deeds connected to the sale of the Lowell Boiler Works reveal that Cowley paid over $17,000 to Elizabeth Dobbins. After the purchase was complete, however, Cowley learned that William Dobbins was insolvent and that he was responsible for paying creditors who were themselves stressed in the wake of the economic depression. Cowley responded by leading a lawsuit against the Dobbins estate in which some of the creditors joined Cowley as

The company's fortunes quickly improved and Dobbins was receiving so many orders for boilers and other metal products that in 1881 he sought a new location in Ayer's City. He acquired property on Tanner Street along River Meadow Brook from William Andrews, a large real estate investor in Ayer's City and a resident of Providence, Rhode Island. By early 1882 Dobbins boiler works was in operation. In addition to a boiler shop, where iron workers fabricated iron or steel boilers, penstocks, vats, and even fire escapes, the wood-frame factory building contained a machine shop, a forge, and a central wood frame tower. A 30 horsepower steam engine provided power to the factory. Depending on the number of orders, Dobbins employed anywhere from 40 to 75 men.[264]

At nearly the same that Dobbins completed his factory, Bartholomew Scannell and Denis Wholey were building their boiler works on the opposite side of Tanner Street. Scannell and Wholey formed a partnership in 1880 when both men moved to Lowell to establish their company. They were born in Ireland, Scannell in 1843, Wholey in 1842, and emigrated with their families to the United States during the Great Famine.[265] Unlike the majority of Irish émigrés in the 1840s who were


SCANNELL & WHOLEY,
—MANUFACTURERS OF—
Steam Boilers
RESERVOIRS, STANDPIPES,
STEEL & IRON PLATE WORKERS.
Locomotive, Flue, Tubular, Cylinder, House Heating and Yacht Boilers of every description; Tanks, Water Wheel Work, Bleaching, Dye and Jacket Kettles, Steam Boxes, Foundry Ladles, Cupolas, Etc. Boiler Fittings of all kinds constantly on hand.
IMPROVED FIRE ESCAPES OF EVERY DESCRIPTION.
SECOND-HAND BOILERS and ENGINES BOUGHT and SOLD.
Repairing promptly attended to. All Work Warranted.
26 to 38 Tanner St., near O.C. Freight House, Lowell.
WORKS AND RESIDENCE CONNECTED BY TELEPHONE.
B. SCANNELL. D. WHOLEY.

This advertisement for Scannell & Wholey's products appeared in the Lowell city directory of 1881. Both Dobbins and Scannell & Wholey produced many of the same goods, but the latter firm found boilers for residential heating especially lucrative. (Source: Lowell City Directory, 1881.)

illiterate, agricultural laborers, Denis Wholey's parents could read and write, and his father, Timothy, possessed skill in the metal-working trade. Bartholomew Scannell's parents, on the other hand, were illiterate. His father, Patrick, was listed as a labor in the federal census and in the Lawrence city directories. Bartholomew attended school in Lawrence until age 12 when he began working in a local grocery. In his teens he shipped out to sea, but eventually returned to Lawrence and entered the

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a plaintiff in the suit. The legal action dragged on for many years. See, for example, "Supreme Court—Colburn J.," *Lowell Daily Courier*, December 7, 1882; "Supreme Court," *Lowell Daily Courier*, December 19, 1882. A notice of Cowley's severing his connection with the company in July, 1876, appeared in the *Lowell Daily Courier*, November 7, 1876, and noted that Richard Dobbins was in charge.

[264] Northern Middlesex Registry of Deeds, v 151, pp. 241-242. *The Bivouac*, p. 53.

[265] Scannell was only two years old when he settled with this family, initially in Hallowell, Maine.

boiler works of J. C. Hoadley. At Hoadley's factory and then at the Stewart & Allen boiler works in Worcester, Scannell learned the boilermaker trade and business. In 1875 he formed a partnership with David M. Dillon in Fitchburg, Massachusetts, and began producing steam boilers and other metal products. Just prior to joining with Dillon, Scannell married Mary A. Wholey, a younger sister of Denis, who was running a grocery in Lawrence. In 1880 Scannell and his brother-in-law decided to establish a boiler-making company in Lowell. It appears that they initially rented land on Tanner Street from the Osgood family, long-standing farmers and large real estate holders in Ayer's City. Scannell and Wholey constructed a wood-frame boiler shop, forge, and storage shed. Although somewhat smaller than the Dobbins factory, Scannell and Wholey's works was immediately busy with numerous orders for both factory and residential boilers.[266]

The rivalry between the boiler makers on opposite sides of Tanner Street heated up most notably in the summer of 1883 when Richard Dobbins opposed the petition of Scannell & Wholey before the city council to expand the company's factory and add a larger steam engine. Dobbins, who also owned a wood frame tenement next to his boiler works, maintained that this expansion would damage his property by as much as $5,000 or $6,000 and that Scannell and Wholey were intent on driving him out of business. Denis Wholey responded that if Dobbins so desired he would purchase the tenement for more than it cost the boiler maker and, as for his concern over competition, Wholey remarked, "if Mr. Dobbins could not stand [it] he had better leave."[267] Following this exchange the city council approved Scannell & Wholey's petition. Within the local Democratic party, the ascendancy of Irish-Catholic politicians in 1880s Lowell appears to have aided Scannell and Wholey in their rivalry with Dobbins, for they were the recipients of various municipal contracts for boilers, including one for the city's new high school and another for the Boulevard Wells pumping station.[268] Irish-American Democrats also intervened on behalf of Bartholomew Scannell to approve his appointment as municipal inspector of boilers, a position that Richard Dobbins, a stalwart Republican and Protestant, had previously held for several years.[269]

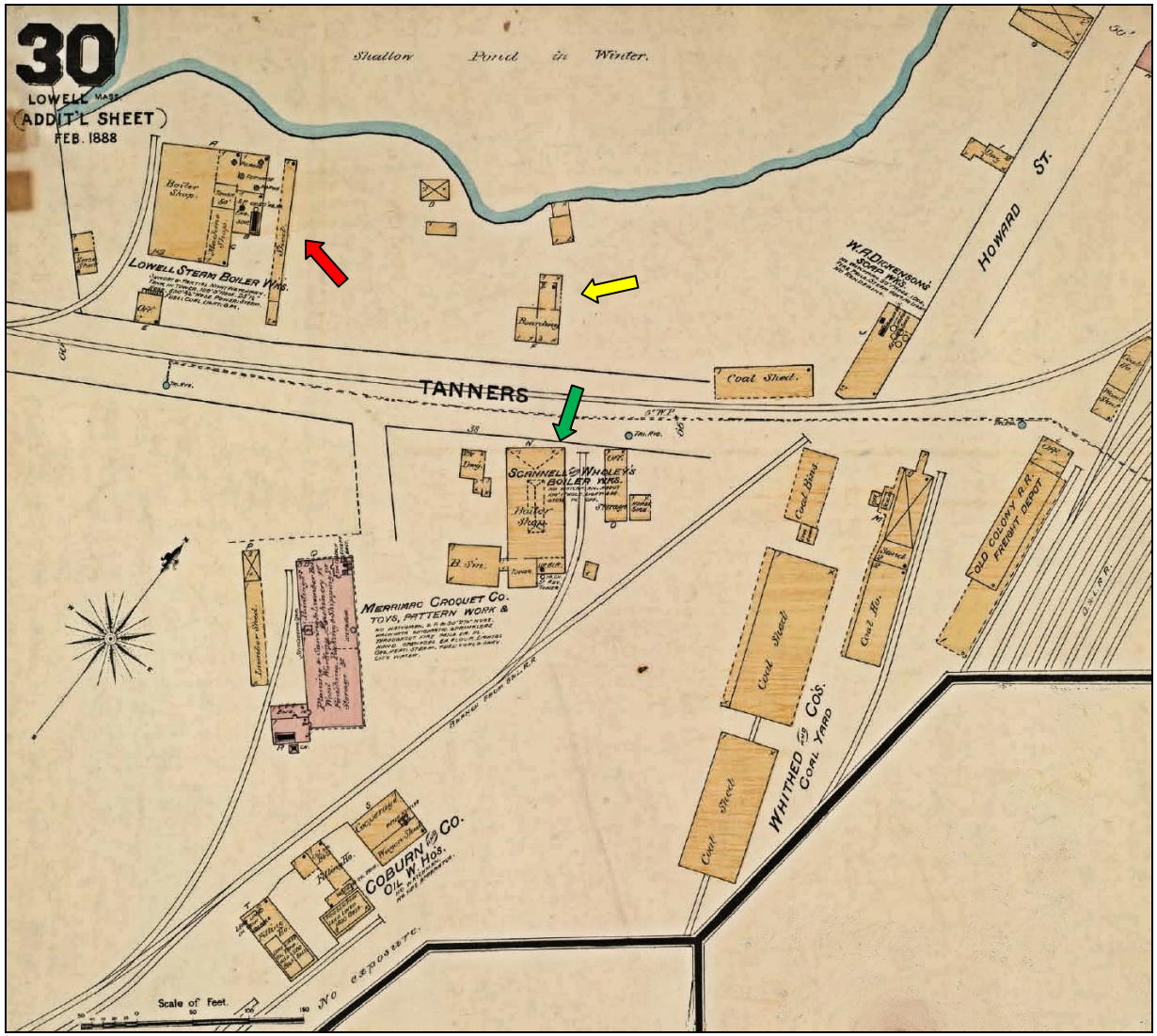
Although often at odds, Dobbins and Scannell & Wholey were also responsible for a number of municipal improvements along this part of Tanner Street. They petitioned the city council for paving roads, constructing sidewalks, and building

[266] Timothy Wholey, the father of Denis, worked in Lawrence as a blacksmith. The federal census of 1850 Lawrence reveals that he and his wife Catherine could read and write, but Patrick and Catherine Scannell, the parents of Bartholomew, were recorded as illiterates. Timothy Wholey died in Lawrence in 1864 at the relatively young age of 45. The fate of Patrick Scannell is not known. Biographical material on Bartholomew Scannell is found in his obituary in the *Lowell Sun*, February 20, 1920. For information on Denis Wholey see his obituary in the *Lowell Sun*, October 29, 1912. Scannell & Wholey purchased this land from the Osgoods in 1884. Northern Middlesex Registry of Deeds, v. 169, pp. 212-213.

[267] "Municipal Meeting," *Lowell Weekly Sun*, September 15, 1883.

[268] "New High School," *Lowell Sun*, February 21, 1894; "Receives the Contract from Water Board," *Lowell Sun*, August 25, 1900.

[269] "City Council Meeting," *Lowell Weekly Sun*, January 14, 1882.

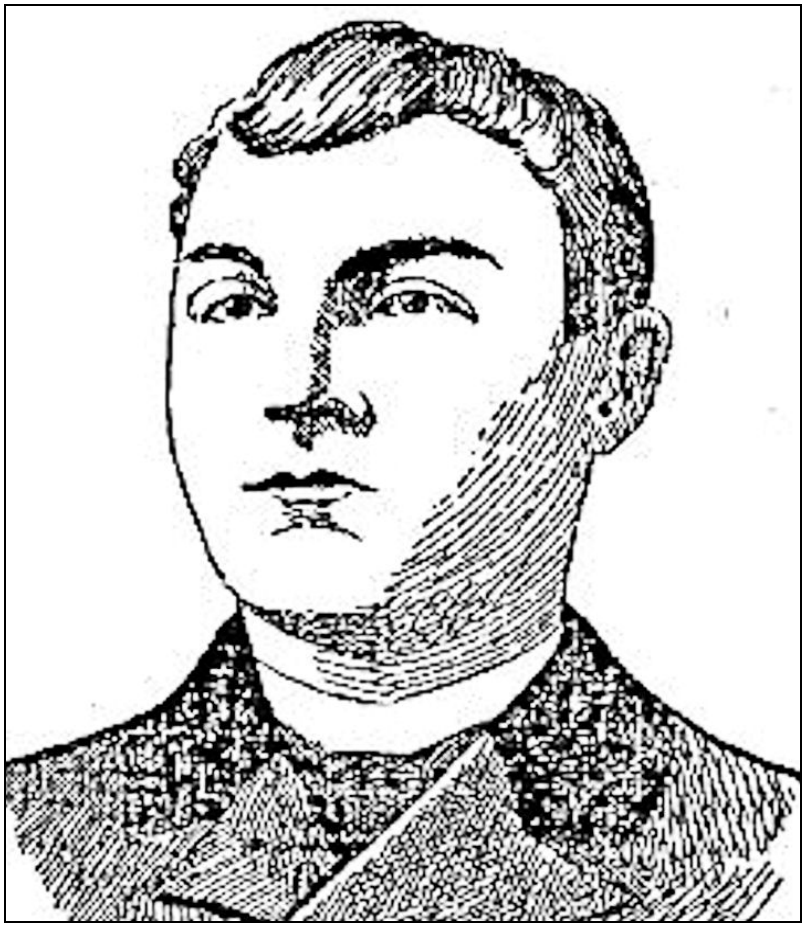


This detail from the Lowell atlas of 1882, updated to 1888, shows the east end of Tanner Street, near Howard Street. Dobbins' Lowell Boiler Works (red arrow) extends north to the bank of River Meadow Brook. Scannell & Wholey's factory (green arrow) is located between Whithed Coal Company's storage sheds, to the right) and the Merrimack Croquet Company's factory (to the left). The tenement (yellow arrow) owned by Richard Dobbins was the lone dwelling at this end of Tanner Street and the shallow pond of the brook was near the rear of this wood-frame dwelling, by the 1880s the setting was not remotely bucolic.

a bridge to carry Cambridge Street across River Meadow Brook. Together they employed some 150 men, a number of whom lived in Ayer's City. Of the two firms, Scannell & Wholey generally enjoyed better labor relations with their workers. When boiler makers demanded increased pay for their nine-hour days and threatened a strike, Scannell accommodated his workers while Dobbins locked out his men.[270]

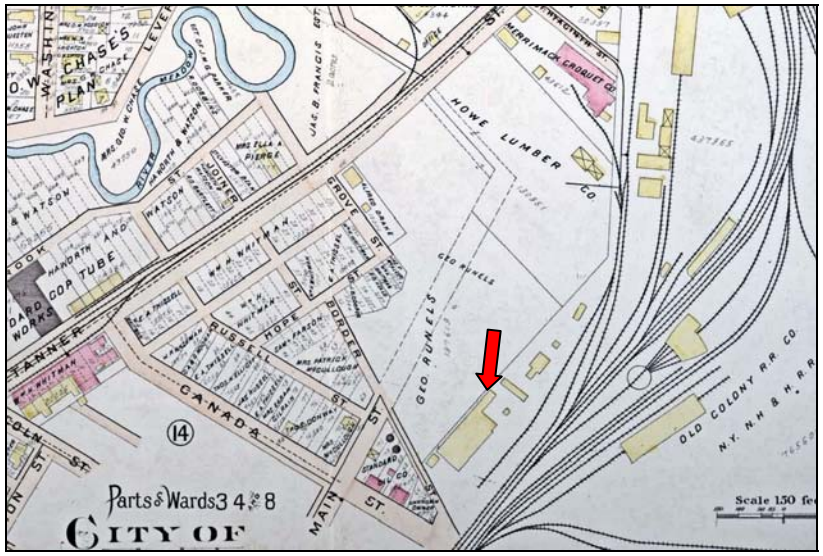
Despite the competition the two companies prospered even though Dobbins suffered severe fire damage at his boiler works in 1891. Toward the close of the century, however, Dobbins decided to sell his company's assets and move west to Washington state. In 1900, at about the same time that Dobbins left Lowell, Scannell and Wholey dissolved their partnership with Bartholomew Scannell acquiring the company. While Denis Wholey moved to Providence, Rhode Island, where he established another successful boiler-making concern, Scannell continued to run the Tanner Street works until his death in 1920. His son, Bartholomew, Jr., then assumed control, operating the company until he retired in 1959. The firm remains in business today and is quite likely the longest-lived family-run industrial firm in Lowell.

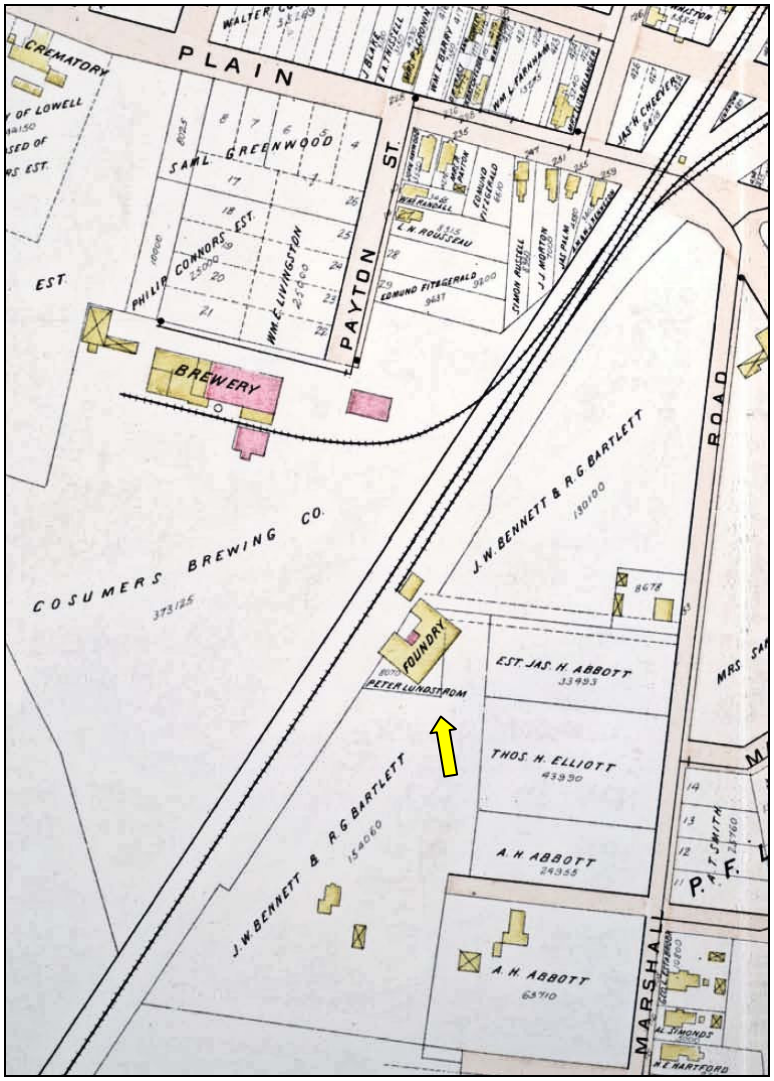
In addition to the two boiler works in Ayer's City, two iron foundries were built in this locale. Edward D. Clark and William P. Edwards established the Union Iron Foundry in 1881.[271] Ten years later Peter Lundstrom, a Swedish émigré



This engraving of Swedish émigré Peter Lundstrom who was a founder of the Eagle Iron Foundry and lived on Main Street in Ayer's City, appeared in the *Lowell Sun*, October 25, 1898, upon his death at age 36 from emphysema.

[270] "Demands of the Boiler Makers," *Lowell Daily Courier*, May 10, 1892.
[271] "A New Foundry," *[Lowell] Saturday Vox Populi*, October 15, 1881.





These details from the Lowell city atlas of 1896 show the locations of the Union Iron Foundry (red arrow) and the Eagle Iron Foundry (yellow arrow). At this time Anthony Robinson, a Lowell grocer and businessman owned the Union Iron Foundry and his brother, James P. Robinson, was the superintendent. The Old Colony Railroad served each foundry, although each also used horse-drawn wagons to deliver iron castings to local customers. Swedish-born Peter Lundstrom was the principal in the Eagle Foundry until his death in 1898. Eventually the Robinson brothers owned both the Union and Eagle foundries. (Source: Center for Lowell History.)

who had settled in Salem, Massachusetts before moving to Lowell, was the lead partner in the inauguration of the Eagle Foundry. The principals in these two firms were experienced foundry men and each company employed between 20 and 30 workers. By the mid-1890s Lowell had six iron foundries with two, the Union and Eagle companies located in Ayer's City.[272]

The Union Foundry was located at "the foot of Main Street" along the tracks of the Old Colony Railroad, while the Eagle Foundry stood near the Harvard Brewery off Plain Street. Moulders, pattern makers, and blacksmiths at these foundries were highly skilled workers who belonged to the International Iron Moulders' Union. Although Lindstrom and Edwards were the proprietors of their respective companies, they could be found working alongside their employees. They produced a range of iron castings, as well as some brass and other metal castings. Between the iron foundries and the boiler works, turn-of-the-century Ayer's City gained the reputation as a smoke-filled, heavily industrialized working-man's district.[273]

On the Outskirts of Lowell

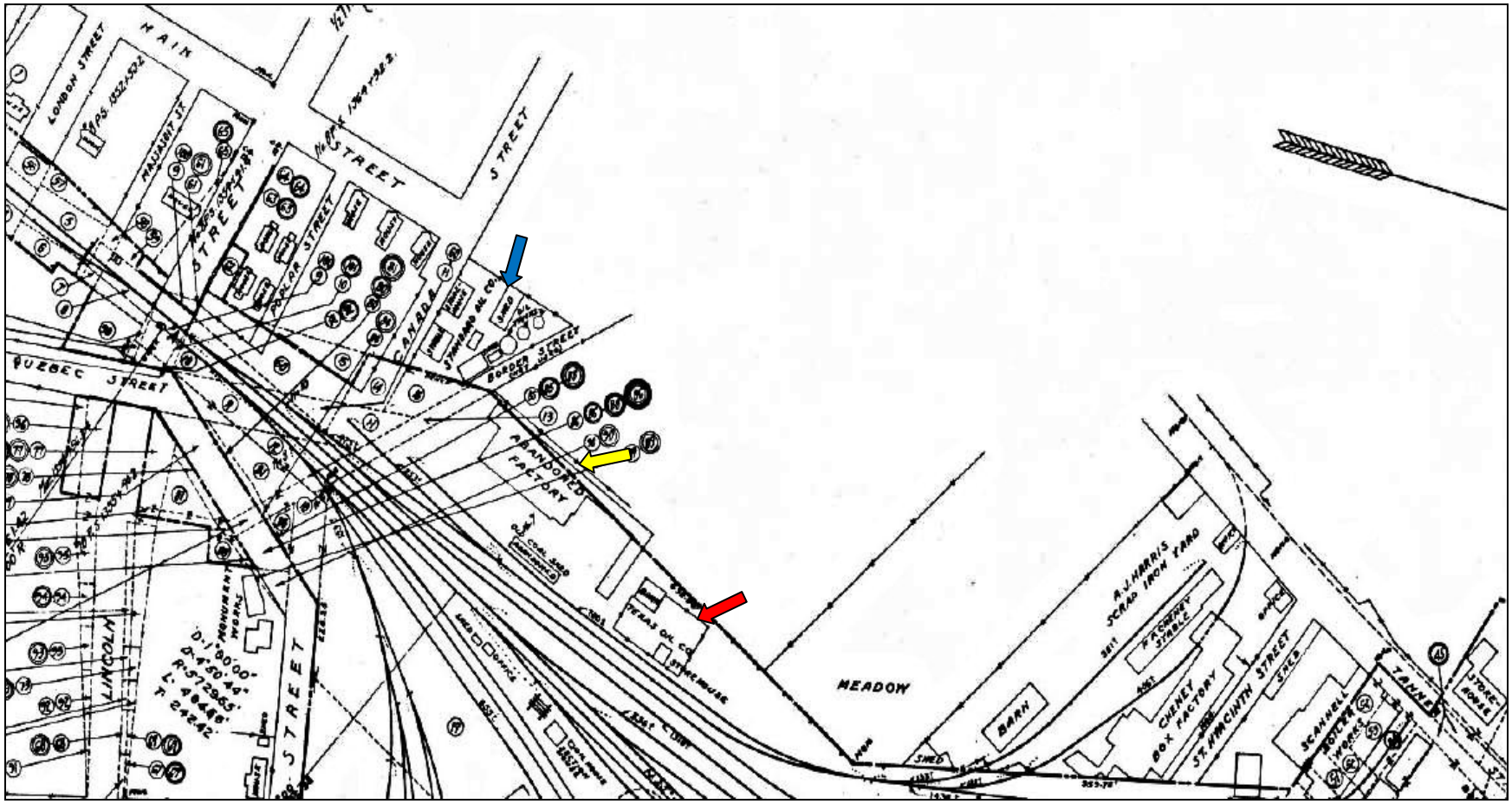
By all appearances Ayer's City, especially along the broad plain bordered to the west by River Meadow Brook, was a patchwork of industrial buildings, warehouses, coal trestles, stone piles, scrap yards, and dusty or muddy roads, with an extensive web of railroad tracks and rail sidings. Adding to this stark landscape were the oil storage tanks, offices, and warehouses of the Standard Oil Company, Gulf Refining Company, and the Texas Oil Company. Standard Oil had been the first major oil company to establish a storage facility in Lowell. This was in 1895 and the company located its tanks and warehouse next to the Union Iron Company's foundry.[274]

Adjacent to these storage tanks and railroad structures were rows of houses that lined Canada Street as well as a series of residential streets to the south. Although there was some green space in this neighborhood as well as to the east where dwellings and cottages were perched on a hillside above the

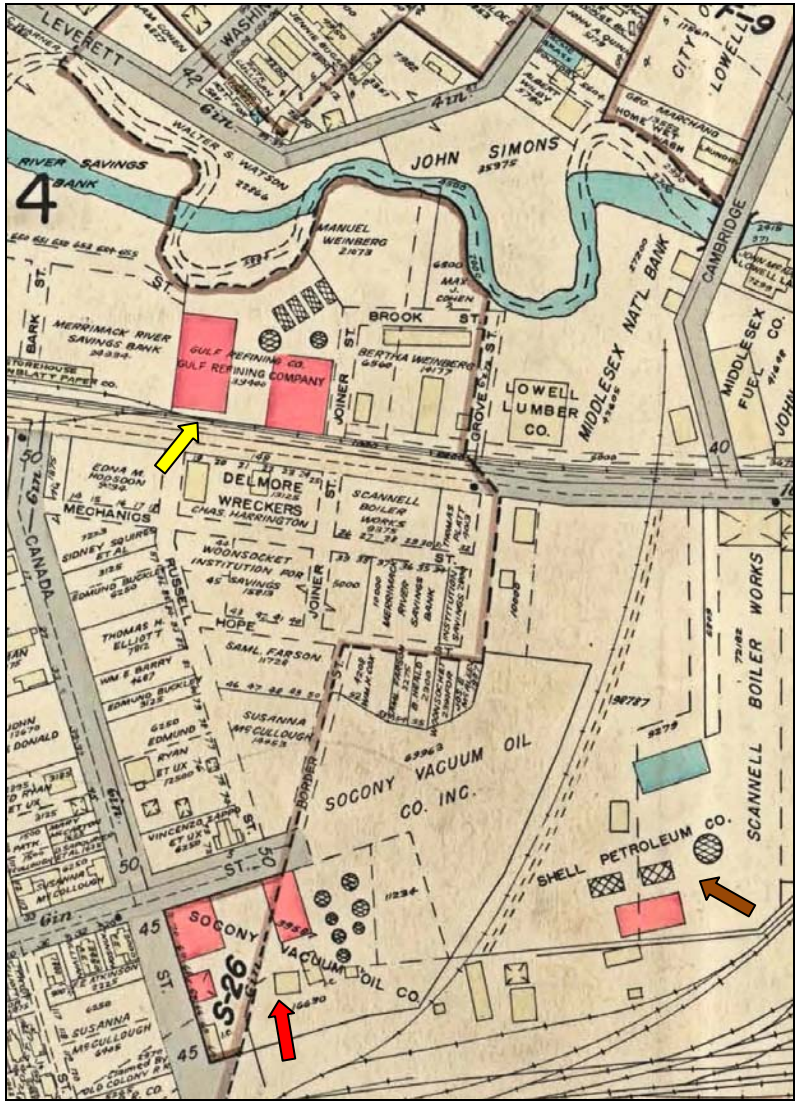
[272] See the Lowell city directories for 1894, 1895 & 1896.

[273] During the 1890s both the Union and Eagle foundries changed hands. Anthony Robinson, a grocer and real estate speculator, acquired the Union foundry from William P. Edwards, who moved to Wilkes-Barre, Pennsylvania. Robinson and his male family members then operated it for many years. Lundstrom became partners with William W. Smith, but the Swede died in 1898 and three years later Smith committed suicide. In 1908 James P. Robinson, brother of Anthony and a partner in the Union Iron Foundry, purchased the Eagle Iron Foundry. After Anthony Robinson died in 1909, James ran the two foundries for several years. He was aided by his sons James P., Jr., and Richard T., but eventually the Robinson's sold the Union foundry property and operated only the Eagle foundry. See Frederick W. Coburn, *History of Lowell and Its People*, v. 3 (Lowell: 1920), pp. 410-11; and an obituary of Anthony Robinson, *Lowell Sun*, October 25, 1909.

[274] The aldermen approved Standard Oil's petition to build oil storage facility on Main Street in late 1894. See "Aldermen Accept Reports and Pass Resolution," *Lowell Sun*, December 6, 1894. Standard Oil relied on rail service to bring oil to its tanks, but shipped its goods in barrels carried in horse-drawn wagons. The Gulf Refining Company built a warehouse and storage tanks on Tanner Street along River Meadow Brook in 1910. See "Two New Buildings," *Lowell Sun*, December 13, 1910. The Texas Oil Company constructed its facility next to the Union Iron Foundry in 1914. It erected two storage tanks each with a capacity of 20,000 gallons. See "Texas Oil Company," *Lowell Sun*, May 22, 1914. In the early 1930s a fourth major oil company, the Shell Oil Company, acquired property on which the Texas Oil Company had built its facility and erected storage tanks with a total capacity of 250,000 gallons. See "Shell Oil Plant Here is Sold," *Lowell Sun*, August 3, 1943.



This map of the Old Colony Railroad right-of-way through Lowell dates from 1914 and shows the recently built Texas Oil Company warehouse (red arrow), the abandoned Union Iron Foundry (yellow arrow), and the Standard Oil Company's warehouse and storage tanks (blue arrow). In the early 1930s the Shell Oil Company acquired the property on which the Texas Oil Company's warehouse stood and constructed larger storage tanks. (Map of Old Colony Railroad right-of-way from the University of Connecticut, University Libraries, Digital Mosaic.)



This detail from the Lowell city atlas of 1936 shows the location in Ayer's City of the storage facilities of three large oil companies. The earliest was the Standard Oil Company's warehouses and storage tanks (red arrow), which were originally built in 1894. By the 1930s, Standard Oil, operating as the Socony Vacuum Oil Company, had reconstructed the original warehouse and iron tanks. Next to Socony Oil was Shell Petroleum (brown arrow). Part of the Shell Oil property had been occupied by the Texas Oil Company, which had built storage structures in 1914, next to the abandoned Union Iron Foundry. The Gulf Refining Company (yellow arrow), located on Tanner Street close to River Meadow Brook, established its facility in Lowell in 1910. (Source: Center for Lowell History.)

the brook, there were few amenities for Ayer's City residents.[275] For Lowell's police, this was the least preferred beat in the city. "It was "lonesome and poorly lighted … with few dwellings and many factories, and with railroad tracks and freight cars making it a mecca for tramps and suspicious characters, and a beat to be dreaded by most any policeman."[276]

Rail passengers leaving Lowell on the old Framingham & Lowell Railroad could be forgiven for overlooking the smoke and grimy terrain as the train exited the city. Observant travelers seated on the right-hand side, however, would have seen a remarkably different landscape while looking out of the rail car windows toward the brook and beyond. A large barn and smaller sheds were visible in the distance, and farm fields, gently sloping down to the brook, were filled during the summer months with cabbages, fruit bushes, and potatoes. "This field of vegetables," a reporter remarked of this scene in 1922, "attracts much attention these days for many rail travelers look over the acreages, admiring the fruits of nature's offerings spread before their eyes on the rolling city farm land."[277] The tillers of this land, though, were not farmers. They were the inmates of the city's poor farm.

The poor farm in Lowell dates from 1833 when the town purchased 150 acres of land from Joseph Pierce for $5,400, and constructed an almshouse and barn.[278] At this time Lowell's population was approaching 15,000 and its poor farm contained less than 50 inmates, the majority of whom were often impoverished and diseased Irish émigrés. In the summer of 1843 newspaper editor William Schouler provided a detailed account of the almshouse. Accompanied by the city physician, Schouler walked nearly two miles from downtown Lowell to reach his destination, which was off Chelmsford Street. There, he observed that the main house, "a large brick building," had rooms for the inmates and a large common area on the upper floor and a lobby and kitchen on the first floor. Each room in which the inmates slept was simply furnished with a bed a chair. Schouler witnessed a group of elderly women, "who were we believe natives of the Green Isle," picking through a bale of hair and fiber for use as mattress or upholstery stuffing. Downstairs off the lobby a school mistress was conducting a class composed largely of orphan boys. Schouler listened while the students "sang several temperance songs and hymns" as well as "songs which they picked up from their parents before they came [here], or from the more aged paupers." Upon visiting the grounds Schouler commented that the land was

[275] The exceptions to this were the landscaped grounds of the Harvard Brewery and the fairgrounds of the Middlesex North Agricultural Society. Many years earlier, in the 1850s, Ayer's City had one of the two most popular skating rinks. Operated by a carpenter, John Greenleaf, this pond was formed from River Meadow Brook and was located near the poor farm. As many as 200 skaters on a given winter's day could be found at "Greenleaf's Park" and the crowds were so large that an omnibus ran from Lowell's downtown to the rink. See, for example, "The Prize Skating at Ayer's New City," *Lowell Daily Courier*, February 1, 1861; "Skating," *Lowell Daily Citizen & News*, December 28, 1860. Greenleaf sold his property to the Framingham & Lowell Railroad in 1874.

[276] This description of the Ayer's City police beat followed on the heels of the shooting of patrolman John F. Healy, who accosted two men in the midst of an early morning robbery of Scannell & Wholey's office at the boiler works. See "Shot Down," *Lowell Sun*, March 6, 1899.

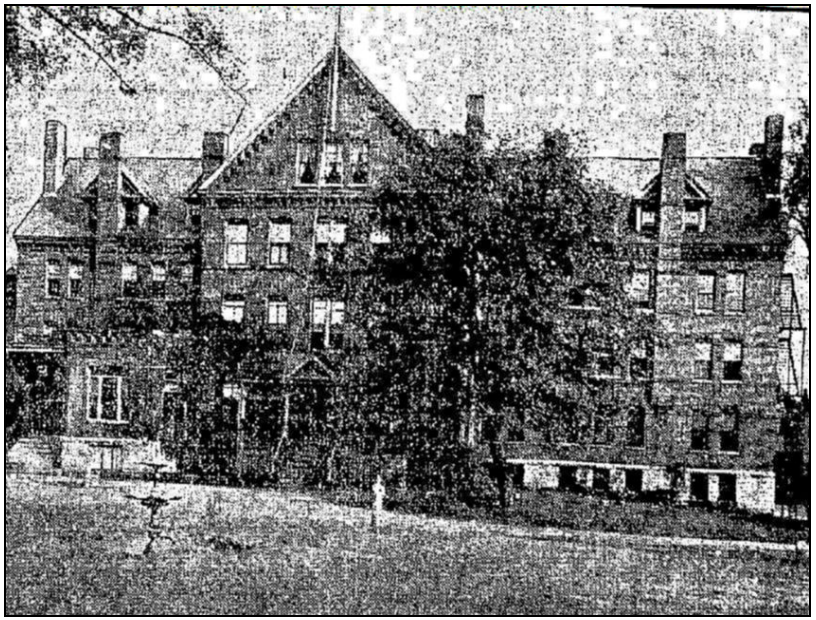
[277] "The Man About Town," *Lowell Sun*, September 15, 1922.

[278] Northern Middlesex Registry of Deeds, 1833, v. 19, pp. 132-135.

"poor and almost worthless for cultivation," but also pointed out that the gardens contained "thrifty vines and vegetables."[279]

While inmates were expected to perform some labor, the climate at the almshouse became noticeably more punitive after 1844 when the city received approval from the state legislature to establish a "House of Reformation for Juvenile Offenders." Begun in 1851 and located on the grounds of the poor farm, the reform school was the third one chartered in Massachusetts. A city ordinance decreed that "habitual truants from school" were to be punished "by confinement at the reform school," the population of which consisted primarily of young boys from poor or working-class families. The reform school received about 50 boys and a few girls each year until it closed in 1896.

Over the 19th century, the city instituted a number of changes at the poor farm. For nearly 10 years in the 1850s, the "workhouse of the city of Lowell" was added to the almshouse and was home to various criminal offenders, notably men and women convicted of public drunkenness. Popular opposition arose and in 1859 the city discontinued the workhouse. But the city council reinstituted it in 1872. By the early 1880s, with a precipitously rising population in Lowell and a growing number of paupers, sick, and mentally ill, as well as male and females who were convicted of petty criminal offenses, the Overseers of Poor recommended a major improvement to the poor farm. The city council agreed and, under the aegis of John J. Donovan, Lowell's first Irish-Catholic mayor, appropriated $60,000 to build a new almshouse and hospital. The two buildings were completed in 1883.



In its most ambitious 19th-century effort to improve its poor farm, the city council allocated $60,000 to build a new hospital, almshouse, and reform school. Local architects Merrill & Cutler designed a series of brick buildings that were completed in 1883. This photograph taken in the early 1900s shows the north façade of the main administration building. (Photograph from the *Lowell Sun*, November 18, 1910.

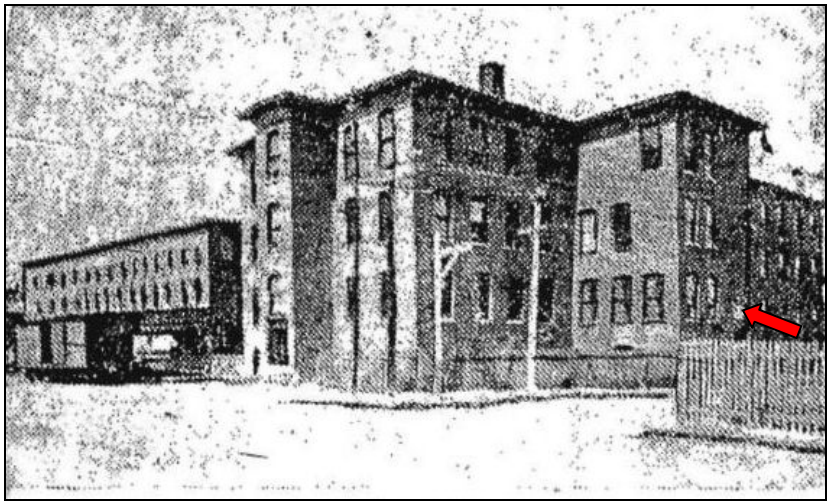
At this time the poor farm, which was run by a city-appointed superintendent and overseen by city-council-appointed members of the Overseers of the Poor, included four departments. The Almshouse, which typically held about 250 inmates (evenly divided between men and women); the Workhouse, which confined yearly between 40 to 50 prisoners, about two-thirds male and one-third female, with age ranges from 18 to 80, all of whom were convicted in the Police Court of petty offenses; the Reform School, which typically had 200

[279] "A Walk to the Almshouse," *Lowell Courier*, August 8, 1843.

students and was overwhelmingly composed of young boys; and the Smallpox Hospital, a small wood-frame building which typically housed less than five patients in any given year.[280] The public was rarely invited onto the grounds of the poor farm and most glimpsed only the buildings from Chelmsford Street or the farm fields that were visible from across River Meadow Brook in Ayer's City.[281] As late as the 1930s, the poor farm was as far on the outskirts of Lowell as was physically possible.

A "Poor Man's Pittsburgh"

The years from 1900 to 1925 were relatively prosperous for industrial and warehousing companies in Ayer's City. The one glaring exception was the Harvard Brewing Company, which, forced to cease beer production in 1919 as a result of Prohibition, dissolved its business.[282] Nevertheless, in addition to the establishment of trans-shipping facilities of three large



This image of the factory of the Lowell Insulated Wire Company dates from about 1907 when the firm purchased the property on the corner of Lincoln and Tanner streets. The main entrance to the plant was on the Lincoln Street side (red arrow). (Photo from the *Lowell Courier-Citizen*, 1907.)

oil companies along or near Tanner Street, a number of new manufacturers moved into this district or expanded their operations. The three most important were the Scannell Boiler Works, the Lowell Shuttle Company, and the Lowell Insulated Wire Company.

Of these three firms, the Lowell Insulated Wire Company was initiated by a British immigrant, Reuben Dunsford, who was born in Manchester, England, in 1879 and at the young age of

[280] See, for example, "Report of the Overseers of the Poor for the Year 1882," published in *City Documents of the City of Lowell, Massachusetts, for the Year 1882-1883*, (Lowell, MA: 1883). The report for the following year notes the completion of the two new brick buildings at the poor farm. See "Report of the Overseers of the Poor for the Year 1883," pp. 5-6.

[281] Occasionally the public learned about the poor farm from newspaper exposes on the terrible conditions at the woefully understaffed and often poorly managed institution. See, for example, "Disgrace to City—The Condition of Our Poor Farm," *Lowell Sun*, February 28, 1902; and "Harry W. J. Howe Reaffirms Statements Relative to Poor Farm," *Lowell Sun*, December 29, 1909.

[282] The Harvard Brewing Company went out of business in the summer of 1920; "The Harvard Company," *Lowell Sun*, July 12, 1920. A rumor circulated that the brewery officials were set to dump the remaining beer in River Meadow Brook, but the company took no such action; "Dump Beer in Brook," *Lowell Sun*, July 23, 1920. The company auctioned off its equipment as well as the eight pair of draft horses used to pull the brewery wagons. Most of these horses were Percherons and had been purchased from a western horse dealer as early as 1905. "Harvard Brewery Horses and Equipment Sold at Auction Yesterday," *Lowell Sun*, July 9, 1920.

21 had been in charge of an electrical wire manufacturing concern in Derby, England. Intent in setting up his own company, Dunsford traveled to the United States to purchase braiding machines, but was induced by a group of Lowellians to start a factory in the Spindle City. In 1903 the Lowell Insulated Wire Company was incorporated with a capital of $100,000 and began operation in part of an abandoned mill in Little Canada. Dunsford served as treasurer but was assisted in the factory operation by his brother Samuel. The electrical wire-making concern appears to have been profitable soon after commencing production and in 1907 the company purchased the former Coburn Shuttle factory on the corner of Lincoln and Tanner streets, shifting its manufacturing there the following year.[283]

The expansion of electrification in growing metropolitan areas, coupled with a rising middle and working class that was purchasing consumer goods powered by electricity, led to ever greater demand for wire cable. Dunsford's company rode the wave of this boom. About 100 workers, about evenly split between men and women, produced a range of rubber-coated insulated wire, especially for lamp cords. Braided cotton or silk threads were used for insulating the copper wire. The company operated a rubber melting and molding department, a waxing department, and 100 braiding machines, as well as a finishing

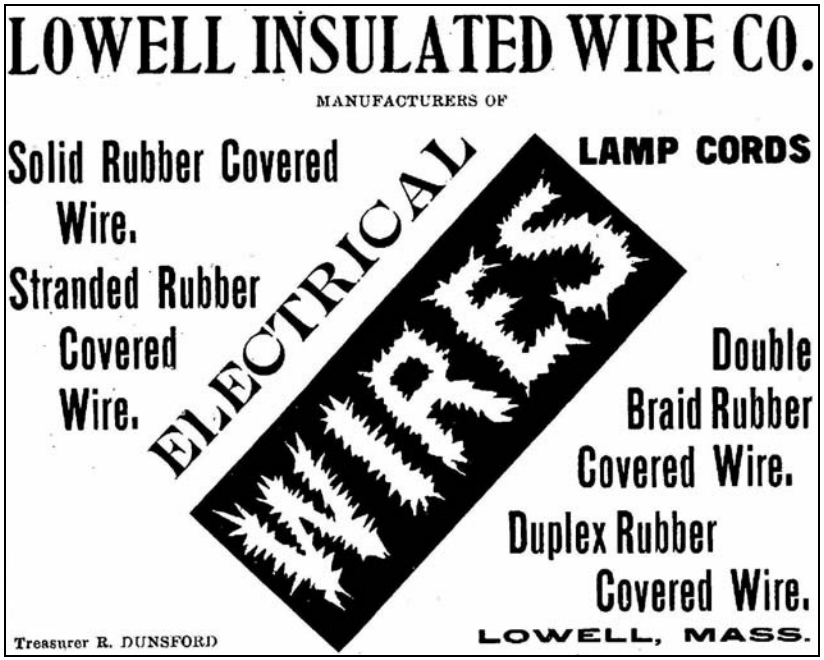
English émigré Reuben Dunsford was in his twenties when established the Lowell Insulated Wire Company in 1903. Initially specializing in cords for electric lamps, the firm was quite successful by the time it moved into the old Coburn Shuttle factory on Lincoln and Tanner streets. (Photo from Coburn, *History of Lowell and Its People*, v. 4.

[283] Information on Dunsford and the Lowell Insulated Wire Company is limited. The best sources include a biographical sketch on Reuben Dunsford in Frederick W. Coburn, *History of Lowell and Its People*, v. 4, (New York: Lewis Publishing Company, 1920), pp. 60-61; the federal census of Lowell for 1910, 1920, and 1930; and a short article on the company in "Ayer's City Industries," Lowell Sun, January 30, 1914.

and shipping department. It also had a testing facility and chemistry lab.

Reuben Dunsford ran the company until his death in 1935 after which his oldest son, W. Bevan, who was born in Lowell, educated at Phillips-Andover Academy and in England, assumed control. Bevan lived in Lowell for a few years before moving into the family house in Chelmsford, but he was more involved than his father in the city's civic affairs. He served as president of the Lowell Community Chest and was also a director of the Lowell Humane Society. Dunsford also pushed for various municipal improvements in Ayer's City, most notably the reconstruction of the Lincoln Street bridge over River Meadow Brook to accommodate heavy trucks that were increasingly used, instead of rail cars, for shipping goods. Indeed, in Ayer's City railroad transport in the post-World War II years began to decline as truck traffic grew and more trucks with large trailers rumbled through Tanner Street.[284]

After Bevan Dunsford's death in 1949 a New York conglomerate, the Overlakes Corporation, acquired the company. Its Lowell factory remained profitable and benefited from large government contracts for wire cable from the U. S. Army's Signal Corps.[285] In 1956, after only a few years under the control of Overlakes, the holding company Penn-Texas Corporation of New York, led by a notorious corporate raider, Leopold Silberstein, purchased Lowell Insulated Wire.



This ad for the Lowell Insulated Wire Company appeared in the Lowell city directory for 1908, shortly after Dunsford's firm moved into the Ayer's City factory.

Silberstein purportedly acquired the Lowell company as part of a strategy to increase its share in the wire cable market, by joining with another wire-making firm controlled by Penn-Texas. Only a year later, however, Silberstein's firm curtailed production and laid off workers at the Lowell plant.[286] The

[284] See the obituary for Bevan Dunsford in the *Lowell Sun*, April 4, 1949, and "Man About Town," *Lowell Sun*, July 25, 1944.

[285] Bevan Dunsford was only 44 years old at the time of his death, which marked the end of local control of the company.

[286] "Lowell Firm Gets $500,000 Army Contract," *Lowell Sun*, August 31, 1950. The other wire manufacturer was the Crescent Company in Pawtucket, Rhode Island, and it also produced insulated wire and cable for the automotive, radio, and other electrical manufacturing industries. The Penn-Texas acquisition of the two companies was reported in various

70,000 square foot factory building was offered for sale and William H. Brady who began a business form and printing company in 1953 eventually purchased the property. Brady Business Forms operated in part of the building for more than 40 years, while leasing out factory space to other companies.[287] Real estate developer Alan Kazanjian acquired the property in 2007.

The move of smaller manufacturers into vacant factory space, rather than construct new buildings, became the typical pattern in Lowell, especially after the 1920s when many of the city's larger industrial firms, notably textiles, either closed or moved to the South. In Ayer's City there were few new factories built after 1900. One exception was the Lowell Shuttle Company, formed through a partnership in 1896 with Charles O'Neil and

The former Coburn Shuttle Company factory was originally built in 1881. Lowell Insulated Wire operated here from 1908 until 1957. Its most recent long-term tenant was Brady Business Forms. This view is from Tanner Street, looking north.

Arthur W. Saunders.[288] Initially the company rented mill space on Western Avenue, but in 1900 it moved to Ayer's City and leased the top floor of Frank Cheney's box factory on St. Hyacinth Street, next to Scannell Boiler. At the time that O'Neil and Saunders relocated to Cheney's factory, there were three other shuttle makers in Lowell. Two were in Ayer's City

newspapers. See "Penn Texas Buys Massachusetts Co." *Oakland* [CA] *Tribune*, October 12, 1956. At the same time Penn-Texas was closing the Lowell plant, Silberstein was waging a highly publicized battle with Robert H. Morse, Jr., chairman of the venerable New England firm Fairbanks, Morse & Co., for control over this long-operating manufacturer of weighing scales, engines, and pumps. See "Fairbanks, Morse Breaks Off Talks with Penn-Texas," *New York Times*, May 4, 1957. Silberstein, a German émigré and economist, was ultimately ousted as chairman of Penn Texas and moved to London where he lived in obscurity for the remainder of his life. The empty factory in Lowell remained unsold nearly two years after Penn Texas closed it.

[287] Among the tenants in the factory was Consolidated Design, manufacturers of electronic circuit boards, which operated at this location between 1967 and 1977. This company employed about 100 workers. Brady Business Forms employed less than a dozen. See "Electronic Firm Buys Former New Knit Home," *Lowell Sun*, December 15, 1977. For information on William Brady and his business see "William Brady Elected NBFA Head," *Lowell Sun*, November 26, 1967.

[288] Prior to starting their own company, O'Neil and Saunders were employed at the J. S. Jacques Shuttle Company in the Wamesit industrial district. Saunders was a bookkeeper and O'Neil was a skilled shuttle maker. Soon after forming their firm, O'Neil managed the factory while Saunders served as the company's business agent. Saunders' wife, Florence, performed the duties of bookkeeper.

and one was in the Wamesit Power Company's industrial district.[289] By 1903, however, there was only the Lowell Shuttle Company and the New England Shuttle Company. Lowell Shuttle proved to be the most successful and by 1911 O'Neil and Saunders began looking for a larger mill.

They decided to construct a factory on Tanner Street across from Scannell Boiler. The one-story building was completed in 1912 and about 50 men, including carpenters, machinists, metal workers, and assemblers, worked there. By 1920 the Lowell Shuttle Company was the only shuttle maker in Lowell.[290] About two years later Charles O'Neil took over the company, which he ran with his sons. Lowell Shuttle remained in business in Ayer's City into the late 1960s and was one of the few manufacturers in operation with close ties to the city's once dominant textile industry.[291]

Scannell Boiler outlasted all other Ayer's City industrial firms with roots in the 19th century firms and contributed, as well, to this locale's reputation as a smoke-filled and gritty industrial zone. Most of the smoke, however, emanated from the several junk yards and scrap-metal operations that sprang up along Tanner Street during the first four decades of the 20th century. The constant pall over Ayer's City moved one local newspaperman to describe the area as "a poor man's little Pittsburgh." "Tanner Street," he wrote, "with its foundries and fabricating plants, its scrap piles and rag paper stores, has a certain picturesqueness [sic] all its own."[292]

[289] This included Frank Parker's shuttle works and the Coburn Shuttle Company in Ayer's City and the Jacques Shuttle Company associated with the Wamesit Power Company. See the Lowell city directory for 1900. Jacques and Coburn were two of the earliest shuttle manufacturers in Lowell. But this industry underwent tumultuous change in 1891 when the giant American Bobbin, Spool & Shuttle Company, capitalized at two million dollars, was formed and acquired a number of New England shuttle and bobbin manufacturing concerns. In Lowell, American Bobbin took over both the Coburn Shuttle Company and Frank Cheney's shuttle works. Although American Bobbin successfully fended off an anti-trust lawsuit in 1892, it struggled financially and many of its plants, including one in Nashua, New Hampshire, which had been a profitable well-run company prior to its takeover, closed. The Coburn Shuttle Company in Lowell was more fortunate and began operating again under its original name. It remained in business until 1903 when it shut down. See "American Bobbin, Spool and Shuttle Company Organized," *Boston Globe*, January 16, 1891;"New Industry Coming," *Lowell Sun*, February 28, 1891;"Alleged Violators of the Anti-Trust Law," *New York Evening Post*, December 15, 1891; "Big Mill Failure," *Boston Globe*, March 27, 1892; "A Syndicate Assigns," *Boston Daily Advertiser*, March 28, 1892; "Bobbins and Shuttles, Ayer's City Works to Reopen," *Lowell Daily Courier*, August 23, 1892.

[290] Saunders and his wife retired and moved to California, leaving O'Neil in control of the company. For a list of Lowell's shuttle makers see the city directories for 1910, 1915, and 1920.

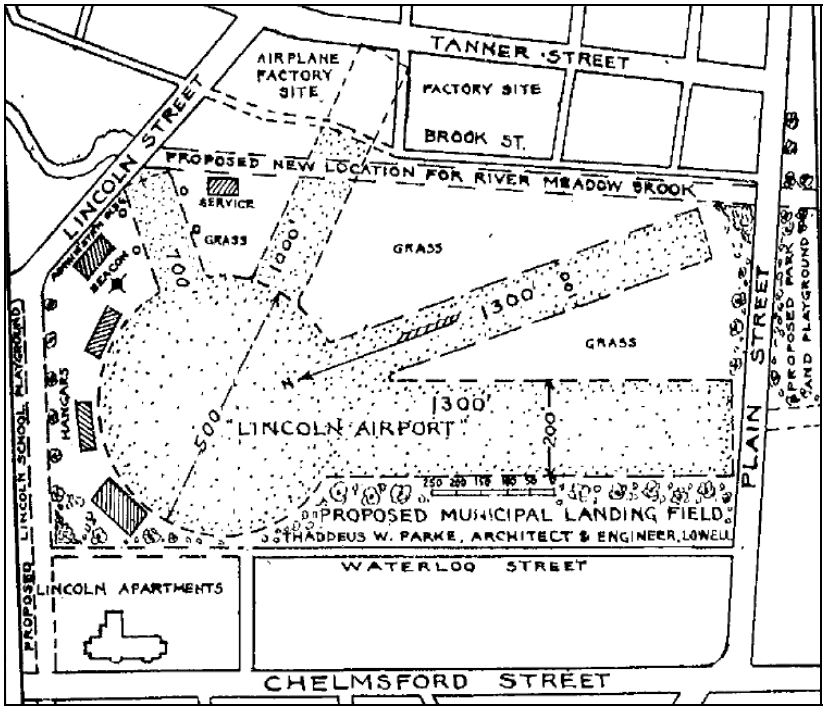
[291] After Charles O'Neil's death in 1944, his sons Frank J., Charles F., and Peter J., ran the company. See Charles O'Neil's obituary in the *Lowell Sun*, October 3, 1944. An illustrated article on The Lowell Shuttle Company was featured in the *Lowell Sun*'s Sunday magazine section, February 28, 1954. Peter O'Neil was the last surviving son of Charles, and he served as the Lowell Shuttle Company's treasurer until his death in 1965. The company ceased operation about three years later. See O'Neil's obituary in the *Lowell Sun*, November 12, 1965.

[292] Charles G. Sampas, "Sampascoopies," *Lowell Sun*, August 28, 1950. In a later *Lowell Sun* column, November 7, 1960, Sampas used the expression "poor man's little Pittsburgh."

Sampas was referring not only to Scannell Boiler and Robinson's foundry (the former Eagle Foundry), but also to the waste paper warehouses and dumps of the Lawrence Waste Paper Company and Greenblatt's paper recycling business, along with the coal trestles, oil storage tanks, and Max Levine's junk yard and scrap metal company. Throughout the 1950s, the Lowell fire department was constantly responding to calls of grass fires, old industrial buildings set ablaze, or concerns over acrid-smelling smoke wafting in the air over dumps and junk yards.[293] Ayer's City, as one newspaperman wryly observed over 50 years earlier, "had never been known for the purity and sweetness of its air." It seemed that little had changed in the succeeding decades.[294]

The Great Depression

In fact, Lowell experienced wrenching economic change beginning in the 1920s and the city's fortunes plummeted to even greater depths during the Great Depression of the 1930s. A number of the large textile corporations closed or moved to the South, throwing thousands of women and men out of work. Of Massachusetts cities with a population of 100,000 or more, Lowell had the highest unemployment rate until World War II. Estimates of joblessness ranged from 25 to over 40 percent of the city's workforce. On Tanner Street nearly a dozen companies went out of business between 1927 and 1935, including the three remaining textile firms in Ayer's City.



Thaddeus W. Parke named his proposed municipal landing field "Lincoln Airport" and he envisioned an airplane factory on Tanner Street as part of the development. Despite enthusiasm among members of Lowell's planning board, the project was never carried out. "Would Reclaim Large Dump Area in Chelmsford Street for Airport Purposes," *Lowell Sun*, July 5, 1930.

During the initial years of these hard times unemployed and impoverished residents flooded city hall with requests for public assistance. At the same time local government officials and members of the business community sought to alleviate the economic plight by attracting new companies or plotting new developments. Ayer's City figured into one proposal, which

[293] See, for example, "Three Tanner Street Fires May Have Been Set," *Lowell Sun*, December 13, 1957.

[294] The quote is from a newspaper reporter who was investigating complaints of air pollution from the Lowell Crematory. See "The Cremator," *Lowell Daily Courier*, July 20, 1893.

was perhaps also the most imaginative: The construction of an airport and airplane factory. Thaddeus W. Parke, a local architect and civil engineer, came up with the idea in 1930 and developed a plan for a "municipal landing field" off Chelmsford Street, between Lincoln and Plain streets, and bordering the west bank of River Meadow Brook. Parke's design included four runways radiating from a circular apron ringed with hangars. The site he chose was a dump, as well as a swampy area along the brook, and he proposed to place carefully selected fill to level the land. Parke also called for relocating the brook between Tanner and Plain streets so that it would follow a relatively straight course. Although some, most notably Smith J. Adams, secretary of Lowell's planning board, endorsed Parke's idea, the city did not embrace it. A privately developed air field, built in South Lowell, was already operating and a financially stressed municipal government proved unwilling to fund a second airport.[295]

Vacant, trash-strewn lots in the vicinity of River Meadow Brook, similar to the property on which Parke had envisioned an airfield, grew in number during the 1930s. This was especially so on Tanner Street, which also suffered from numerous abandoned buildings. Between 1927 and 1939, of the nearly two-dozen structures that lined this street, the number of vacant buildings grew from just two to eight. The drop in property values, however, offered opportunities to a few businessmen. One such entrepreneur, Max Levine, opened a junk yard on Tanner Street, between West Manchester and Montreal streets, in 1932. Born in Kovno, Russia, (now Kaunas Lithuania), in 1888, Levine immigrated to the United States at the age of 20 and settled in Lowell. Levine was a member of Lowell's small but growing Russian Jewish community and he initially worked as a teamster, hauling junk for other scrap yard owners. One of these owners, David Ziskind, who was also a Russian Jewish émigré, had become a wealthy junk dealer and operated his business at the other end of Tanner Street, at the corner of Cambridge Street, along River Meadow Brook, where the old Lowell Steam Boiler Works of Richard Dobbins was once located.[296] By the late 1930s, however, Levine

[295] A five-member planning board in Lowell was established in 1914 as part of a municipal reform program. The mayor selected the members which were subject to approval by the city council. Smith J. Adams became president of the planning board in the 1930s and Parke joined the board about one year after he proposed the municipal airport. See "Would Reclaim Large Dump Area in Chelmsford Street for Airport Purposes," *Lowell Sun*, July 5, 1930. Butler Ames of the Wamesit Power Company played a leading role in the development of the Lowell Airport off Woburn Street in South Lowell near the Concord River. It was completed in 1927 and dedicated the following year. See "Landing Field for Lowell," *Lowell Sun*, July 27, 1927. In addition to this airfield, the Moth Aircraft Company, a manufacturer of light airplanes, leased land from the Wamesit company and opened a factory here in 1928. "Moth Aircraft Signs Lease on Plant – Will Start Soon," *Lowell Sun*, November 23, 1928.

[296] By 1919 Ziskind was Lowell's largest scrap iron dealer and he owned a considerable amount of real estate in Ayer's City, including, for several years in the 1920s, the Harvard Brewery property. Ziskind and his wife Rose, who were born in Lithuania, helped found Lowell's Montefiore Synagogue in 1907. They had a daughter and four sons, one of whom was Jacob who acquired the Merrimack Mills in 1946 and was one of the nation's major Jewish philanthropists. Another son, Edward J., succeeded his father in the junk yard business at Cambridge and Tanner streets. David Ziskind died in 1929. See "Ziskind Co. Doing Big Junk Business," *Lowell Sun*, March 30, 1919; and his obituary, *Lowell Sun*, March 4, 1929. Also

operated the largest junk dealership in Ayer's City. He prospered especially during World War II when scrap iron and steel were in high demand.[297] After Levine's death in 1945 his sons David and Philip carried on the business, which continues today.[298]

With the Ziskind and then the Levine businesses on Tanner Street, Ayer's City increasingly gained the reputation as a center for junk yards and scrapped automobiles.[299] But long-standing coal businesses remained in this locale throughout the 1930s and into the 1950s. These concerns were clustered at the northern end of the Tanner Street area and operated sales offices, coal yards, and coal sheds and trestles along the tracks of the New York, New Haven & Hartford Railroad and the Boston & Maine Railroad, in the vicinity of River Meadow Brook. The largest was the Lowell Coal Terminal of the Delaware, Lackawanna & Wilkes Barre Coal Company, next to the Scannell Boiler Works.

The origins of the Lowell Coal Terminal date from 1875, when Lowell businessman Darius Whithed initiated a coal dealership in Ayer's City along the Framingham & Lowell Railroad. In 1878 Whithed was the first in the city to connect his company with the newly established telephone exchange and he ran a sales office on Merrimack Street. It was also in 1878 that Darius Whithed died in an accident at the Ayer's City coal shed.[300] For the next ten years his partner, Wesley R. Batchelder, directed the company, but he was assisted by Walter T. Moore who married a daughter of Darius Whithed in 1880. In a partnership with Sidney W. Wiggin, Moore assumed control of the Whithed Coal Company after Batchelder departed for Boston in 1889. For a few years in the early 1900s Moore became the best known and most reviled coal dealer in Lowell. Moore engineered the largest consolidation of coal sellers in 1902 when he formed the Lowell Coal Company.[301] He then struck a deal with the New York, New Haven & Hartford Railroad to lease the railroad's newly constructed coal elevator on the site of the demolished Whithed coal shed and trestle.

This massive coal storage and handling facility, which was the largest in New England, towered over the neighboring industrial buildings. As one reporter noted, "the passenger to or from Lowell on the Boston and Maine or the N.Y., N.H. & H

see, "Final Rites for Jacob Ziskind Conducted at Temple Beth El," *Lowell Sun*, October 20, 1950.

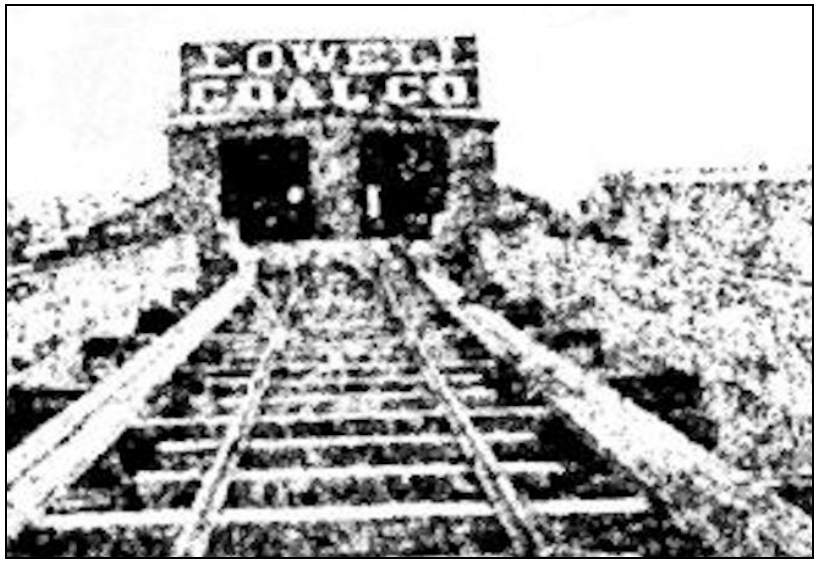
[297] "Record Salvage Reap," *Lowell Sun*, October 13, 1942.

[298] See Max Levine's obituary in the *Lowell Sun*, May 22, 1945.

[299] In addition to the Levine and Ziskind companies, George J. Bresth operated a junk yard on Howard Street near the intersection with Tanner Street. See, for example, the entry of Bresth in the Lowell city directory for 1935.

[300] "Sad and Fatal Accident—Mr. Darius Whithed Instantly Killed," *Lowell Daily Citizen*, December 7, 1877.

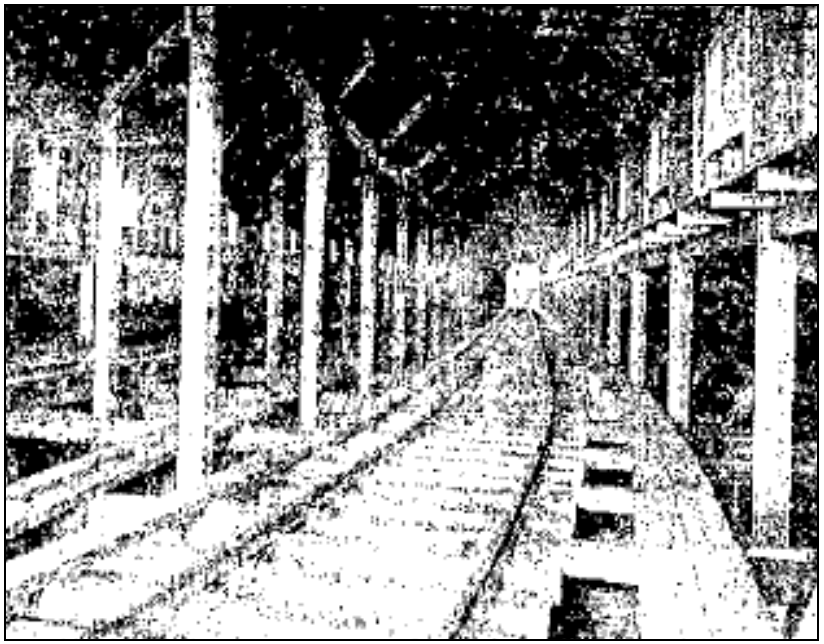
[301] The merger that formed the Lowell Coal Company included Walter Moore's Moore & Bennett Coal Company (which succeeded the Whithed Coal Company in 1900), the William E. Livingston Coal Company, the Parker Coal & Wood Company, and the Middlesex Coal Company. Walter Moore became vice president and general manager of the new concern, William E. Livingston was president, and Walter L. Parker was treasurer. In addition, Moore's son, Arthur C. Moore, was appointed clerk. See "A New Coal Combine," *Lowell Sun*, October 24, 1902.



Completed in 1902 the Lowell Coal Terminal in Ayer's City was New England's largest coal elevator. The mammoth timber-frame structure measured 350 feet in length, was 80 feet wide, and 50 feet wide. (Source: *Lowell Sun*, June 25, 1904.)

railroads cannot get in or out of the city without seeing before him, in gigantic letters, the sign 'Lowell Coal Company,' high in the air, on the roof of a tremendously large building, the size of which daily attracts the attention of hundreds passing in the trains, and causes much comment as to the nature of the great structure, with its formidable sign."[302] The elevator contained 24 bins that extended along each side of the building and the total storage capacity amounted to 25,000 tons of coal.

[302] "New Coal Pocket—The Largest Coal Elevator in New England," *Lowell Sun*, June 25, 1904.

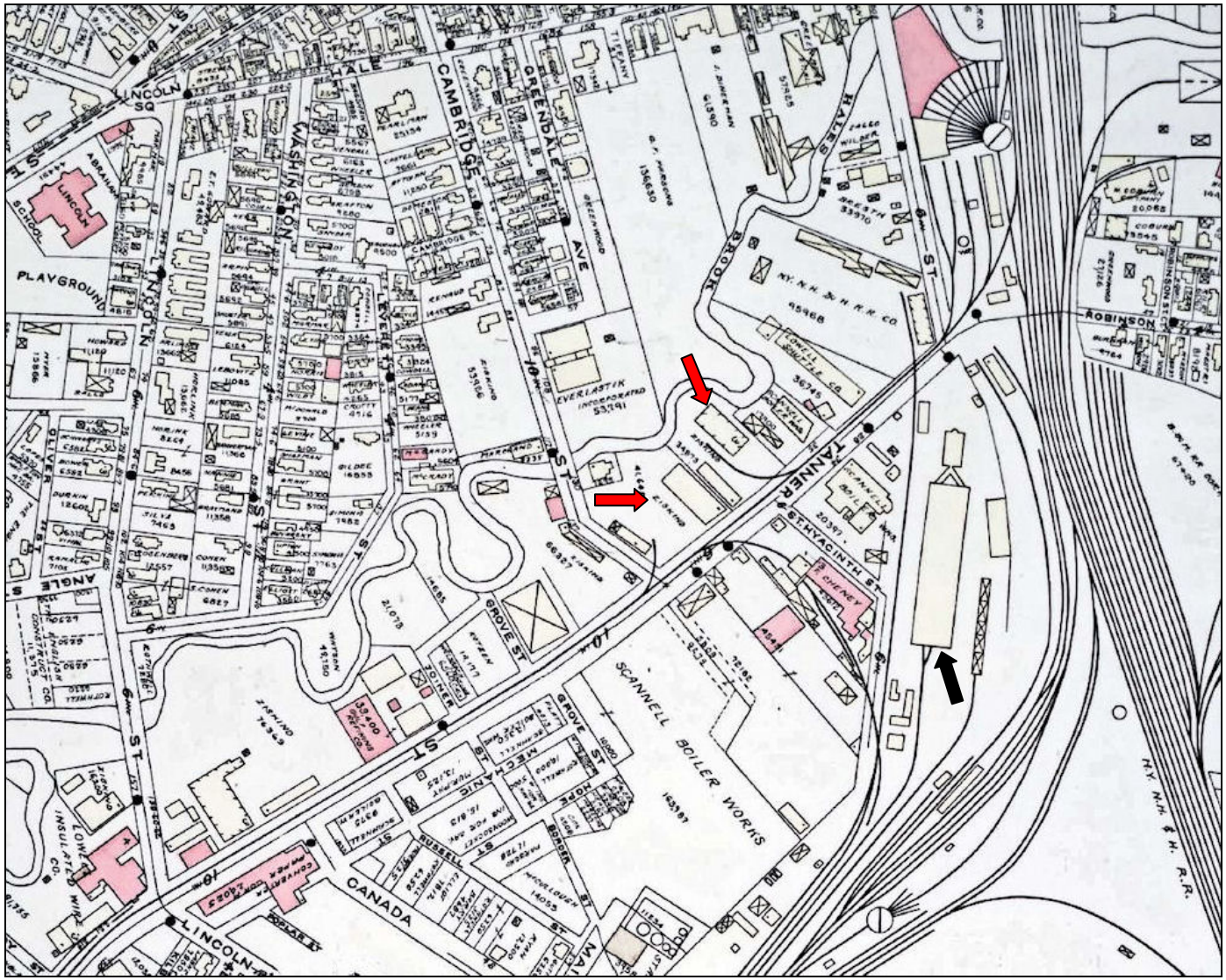


This view of the elevator interior shows the railroad tracks that gondola-type rail cars used to dump coal into the storage bins below. (Source: *Lowell Sun*, June 25, 1904.)

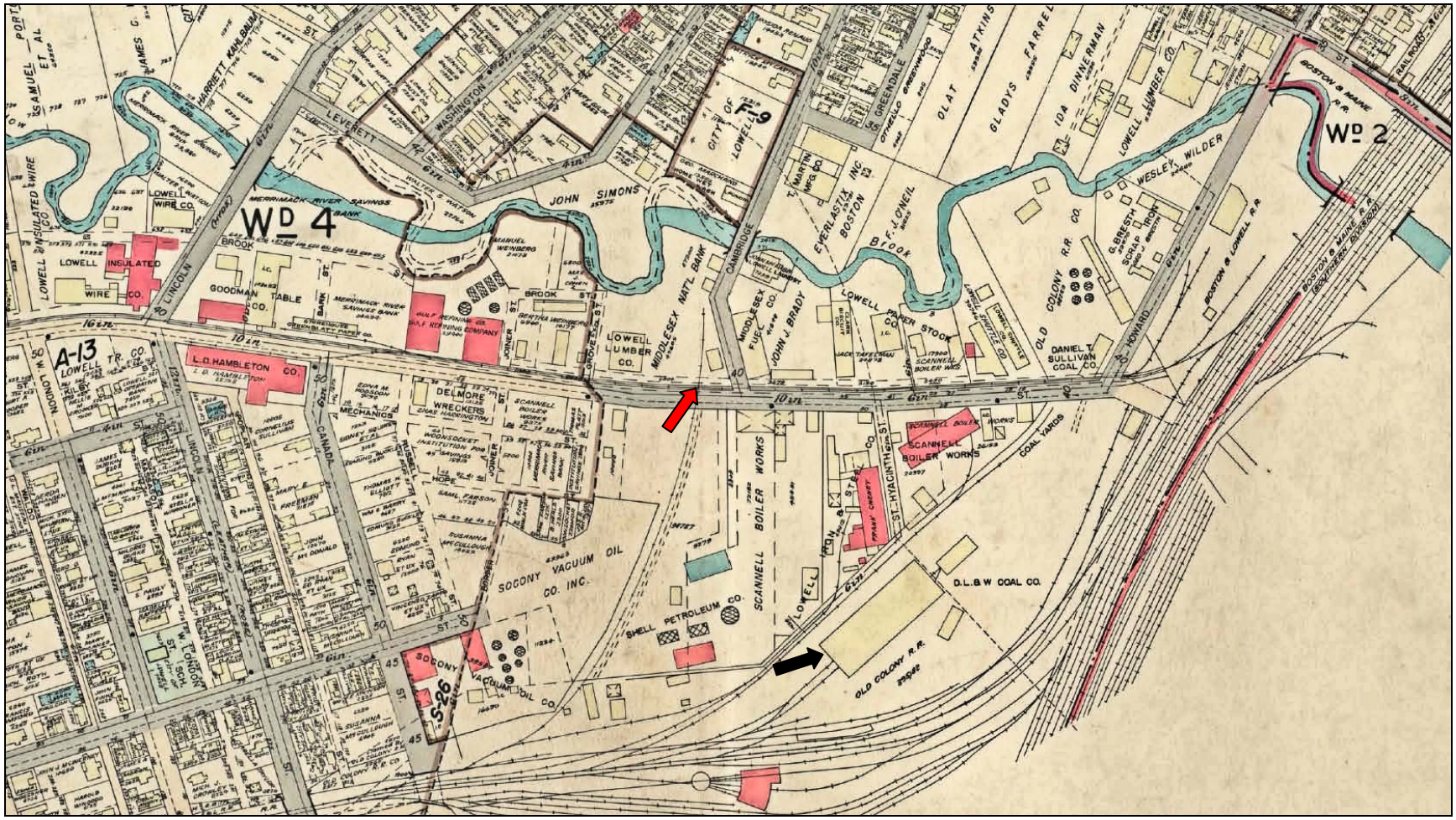
Anthracite and bituminous coal, used for heating homes and other buildings, as well as coke, which was used primarily for manufacturing purposes, were stored in these bins.[303]

The Lowell Coal Company employed 60 men at the elevator and yard, three of whom worked in the yard's office. Loading

[303] Wood served as another source of fuel for heating primarily homes and tenements and many coal dealers also sold cords of hardwood. This was on the decline in the early 1900s, however, as coal became the dominant fuel for heat.



This detail from a 1924 Lowell atlas shows the extensive junk yard of David Ziskind (red arrows) and the massive Lowell Coal Terminal (black arrow), which was completed 20 years earlier



By 1936 Edward J. Ziskind, who had succeeded his late father, David, in the junk business, was operating at Tanner and Cambridge streets (red arrow—the Middlesex National Bank assumed ownership of the property after the Ziskind estate defaulted on the mortgage). The Lowell Coal Terminal (black arrow) was operated by the Delaware, Lackawanna & Wilkes Barre Coal Company of Massachusetts.

into wagons for delivery to customers throughout the city was accomplished via a gravity system. The horse-drawn wagons entered one of the 24 passageways which led into the elevator below each storage bin. Each bin, in turn, had 12 apertures with a lever for each aperture to open and control the amount of coal that was loaded into the wagon. The opened apertures did not simply pour coal directly into the wagon. Instead, the coal tumbled down inclined screens, which extended down from each aperture, conducting it into the wagon. Each screen also contained dust boxes that collected smaller coal particles, which were then carted away and rescreened in the coal yard.

This system allowed one man with a team of horses to load a wagon full of screened coal, instead of the 25 minutes of more intensive hand-labor that was formerly required. The elevator featured two carefully constructed driveways, one of crushed stone into the passageways, and the other of granite blocks that extended away from the elevator into the weigh stations and onto Tanner and Howard streets. This insured solid and safe-footing for the horses. Nevertheless, despite the screens and dust boxes inside the elevator, the site was a dusty and dirty place for humans and animals alike. Coal dust explosions, though rare at such storage and handling facilities were a constant threat. And a thin layer of coal dust covered the ground and buildings.

Several months after the Lowell Coal Company began operations at the Lowell Coal Terminal the firm, which had been struggling financially, faced bankruptcy. The problem stemmed, in part, from the fierce competition among local coal dealers and the failed attempt of a number of Lowell company officials, including Moore, to join together and fix the selling price of coal. Lowell and other New England communities faced periodic "coal famines," the most serious occurring in the winter of 1902-03, on the heels of the great anthracite coal miners' strike. These shortages led to both price hikes, which brought great distress to working-class families and the poor, and an escalation in price wars, as some coal dealers sought to undercut the competition by selling coal at a loss. In early 1904 a state investigation into price fixing in Lowell and Lawrence, legislators revealed that Moore and a group coal dealers had formed a "coal club" with the aim of stabilizing prices and discouraging price cutting. For Moore, who had amassed considerable wealth and owned an opulent home in the Belvidere section of Lowell, as well as a large estate in Amherst, New Hampshire, these hearings proved a public relations disaster. Many Lowell residents refused to buy coal from Moore's company and in November, 1904, while investors were discussing the amount of financial attachments to be placed on Moore, Livingston, and the other partners, Walter Moore fired a shotgun blast into his chest at his Amherst home and died instantly.[304]

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[304] Moore's reputation suffered irreparable damage during the anthracite miners' strike of 1902, when he was seen as insensitive to the plight of the poor by raising the price of coal. Although coal shortages in Lowell were the result of many factors, with the Lowell Coal Company playing only a minor role in this widespread problem, Moore reaped the greatest scorn in the city. The attempt of Moore and several other dealers to form a "coal combine" in Lowell merely worsened the ill-feelings toward him. See "Fuel for the Poor," *Lowell Sun*, October 2, 1902; "Coal Situation," *Lowell Sun*, January 6, 1903; "Famine Prices," *Lowell Sun*, February 6, 1903; "In Two Cities—Coal Committee Hears Dealers' Stories," *Boston Globe*, March 5, 1903; "Had Poor Memories—Lowell Coal Dealers Blighted With a

The Lowell Coal Company was quickly dissolved and its assets, which included property connected with the Lowell Coal Terminal were sold at auction. As a result local control of the Terminal was lost as the Lehigh and Wilkes Barre Coal Company of Wilkes-Barre, Pennsylvania, assumed the lease. Among the largest anthracite mining concerns in the United States, Lehigh & Wilkes-Barre operated the Terminal as a wholesale coal dealer, selling coal to other dealerships in Lowell.[305] Motorized trucks replace horse-drawn wagons in the transport of coal throughout the city. In the early 1920s the Pennsylvania-based firm was reorganized and by the 1930s the Delaware, Lackawanna & Wilkes Barre Coal Company of Massachusetts, a subsidiary firm, ran the Coal Terminal. Nearby were the coal yards of the Fred H. Rourke Company, Daniel T. Sullivan, and the Middlesex Fuel Company.[306] By the 1940s, Sullivan was the only retail coal dealer in Ayer's City, as fewer homes were heated with coal.

The massive terminal structure remained standing until the summer of 1956 when an arsonist set fire to the building, which contained 4,000 tons of coal, engulfing it in flames and threatening the surrounding industrial buildings. Fire departments from as far away as Reading, Wakefield, and Methuen assisted Lowell fire fighters in extinguishing the blaze. Coal and parts of the charred ruins continued to burn for more than a month before finally ceasing. The New York, New Haven & Hartford Railroad then assisted the city in demolishing the remnants of the once celebrated coal elevator.[307]

In contrast to the stark landscape created by the coal, oil storage, and iron and steel companies that continued in business in the northern section of Ayer's City during the 1930s, one old industry, the Harvard Brewing Company, off Plain Street, maintained a small amount of green space. Having reopened after Prohibition in 1933, the brewery was modernized by a New York syndicate that purchased the property.[308] The board of directors included the German-born, automobile manufacturer Fritz von Opel and Walter Blumenthal, member of an international banking firm with ties to Germany, and German-born merchant Theodore Hoffacker, living in Brooklyn, New York. Local businessman and real estate developer Walter E. Guyette was vice president and general manager of the brewery which employed over 300 men

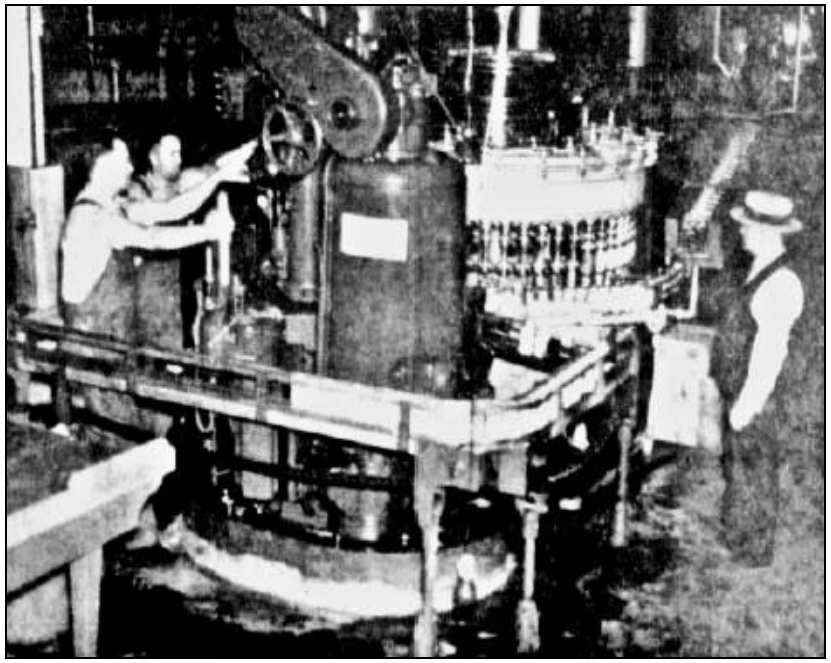
Common Affliction," *Lowell Sun*, March 5, 1903. On Moore's demise see "Walter T. Moore—Manager of the Lowell Coal Company Suicides," *Lowell Sun*, November 23, 1904; "Simple Services—Walter T. Moore Buried in Edson Cemetery," *Lowell Sun*, November 26, 1904.

[305] "Coal Situation—At It Affects the Local Dealers Today," *Lowell Sun*, March 21, 1906.

[306] "Clash Over Coal Company—Sale of Lehigh and Wilkes-Barre Stirs Up Big Interests," *New York Times*, November 24, 1921; Lowell city directories 1922, 1927, 1932, 1939 & 1942.

[307] "Seek 'Torch' in Spectacular $125,000 General Alarm Fire," *Lowell Sun*, August 8, 1956; "City's 'Problem Fire' Nearly a Month Old," *Lowell Sun*, September 2, 1956.

[308] "Harvard Brewery To Turn Out Beer Again," *Lowell Sun*, December 12, 1932. The rehabilitation of the brewery buildings and surrounding lands was carried out in 1933 under the direction of the Lowell contracting firm of Robinson & Robinson, headed by John W. Robinson and his partner, Priscilla Robinson, who was also his daughter. See "Lowell Firm Had Contract," *Lowell Sun*, September 28, 1933.



Among the improvements to the Harvard Brewery after it reopened in 1933 was the installation of beer canning equipment in 1938. Shortly after the Fort Knox Construction Company bought the brewery in 1956 much of the machinery was removed and sold. (Photograph from the *Nashua Telegraph*, August 26, 1938.)

and women, an important source of jobs in a city wracked by the Great Depression.[309] Although profitable for a few years, the brewery was losing money by 1937 and a group of investors, led by von Opel, acquired the company. Additional capital was invested in the brewery, including the installation of beer canning equipment.[310]

Soon after the United States entered World War II, the federal agents declared von Opel, who was residing in Palm Beach, Florida, a "dangerous alien" and arrested him. The U.S. government confiscated his properties, including the Harvard Brewery.[311] Guided by local manager Walter Guyette, the brewery operated under the aegis of the federal government until 1956, when it put the property up for bid. The Fort Knox Construction Company of Miami, Florida, then purchased the, plant. Despite assurances that the brewery would not only continue, but expand, the company's president Bernard J. Harris did neither.[312] Instead he sold the buildings and property to the Hampden Brewing Company headquartered in New York City. This company removed much of the machinery and the brewery was vacant when a fire heavily damaged the main brew house. An even more disastrous blaze four years later destroyed the brew house, obliterating one of the most impressive architectural landmarks in Ayer's City.[313]

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[309] Hoffacker moved to Lowell where he served as chairman of the board of the Harvard Brewing Company, with Guyette as general plant manager. "Hoffacker Reelected Head of Company Here," *Lowell Sun*, December 14, 1934.

[310] "Harvard Adds Canning to Its Modern Brewery," *Nashua [NH] Telegraph*, August 26, 1938.

[311] "G-Men Nab German Baron Known Here," *Lowell Sun*, February 27, 1942. When von Opel was in Lowell on brewery business he resided at the Vesper Country Club.

[312] "Highest Bidder for Harvard Brewery Plans To Expand It," *Lowell Sun*, April 5, 1956.

[313] "Stubborn Fire Damages Part of Harvard Brewery," *Lowell Sun*, August 28, 1957; Louis O. Beede of Lynn, Massachusetts, purchased the brewery property from the Hampden company. Beede produced sawdust in the former brew house. A sawdust explosion and fire in 1961 seriously injured three employees and destroyed the building. "Fire Destroys Brewery Building," *Lowell Sun*, March 7, 1961.

Public Works and River Meadow Brook

Of the many public works programs in Lowell during the Great Depression, one entailed the cleaning and channel straightening of River Meadow Brook near the Harvard Brewery. Carried out in 1938, this project involved only about 40 men. That year 2,900 women and men were employed in the city under the aegis of the Works Progress Administration (WPA). Thus the brook's dredging and channel relocation represented one of Lowell's smaller-scale WPA projects. It resulted in the straightening of a short stretch of the stream south and west of the brewery, but also led to the flooding of property near Plain Street, where a temporary coffer dam had been constructed as part of the channel relocation work.[314]

A far more ambitious WPA project at River Meadow Brook was planned for 1939. With support from Congresswoman Edith Nourse Rogers federal funds amounting to $568,000 were awarded to the city of Lowell to dredge, straighten, and clean up the brook, as well as remove the dam near Gorham Street. The project had the strong backing of a young, influential city councilman, Thomas E. Garrity, whose family home was on Chelmsford Street near Plain, overlooking the brook. And city engineer Stephen Kearny produced plans for executing the work. In fact, one important element in Kearny's plan involved removing "peat and organic matter" from the new channel and from low marshy areas, and replacing it with clean sand. This was aimed at improving the water quality within the Cook well field.[315] Both Garrity and Kearny viewed the brook as a health hazard, reflecting the long-standing perceptions that the stream was a nuisance to be abated.

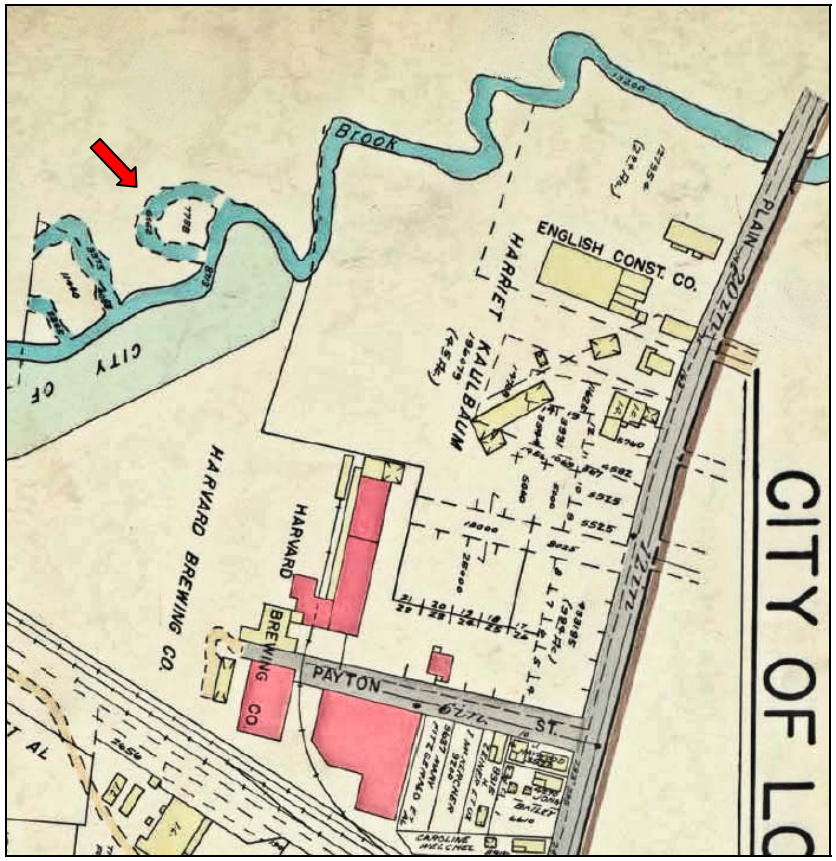
After State Health Commissioner Dr. Paul J. Jackmauh reviewed and approved the plan, the city sought to hire about 175 men to work on the year-long project. With work expected to begin in the summer of 1939, the city council approved a $2,500 expenditure to purchase the dam near Gorham Street, called Butler's dam, after its late owner, Josiah Butler, so that it could then be demolished. Walter Guyette, manager of the Harvard Brewery, notified the mayor that he objected to the dam's removal, claiming that this action would endanger the ground water supply used by his company.[316] While Guyette's opposition raised concerns among some of the council members, the project became bogged down for a variety of reasons. Most significant was a growing unrest among WPA workers over wages and hours that culminated in strikes across the nation, as well as in Lowell, in July, 1939.

In addition, at the state level, a political battle between Republican governor Leverett Saltonstall and Democrat

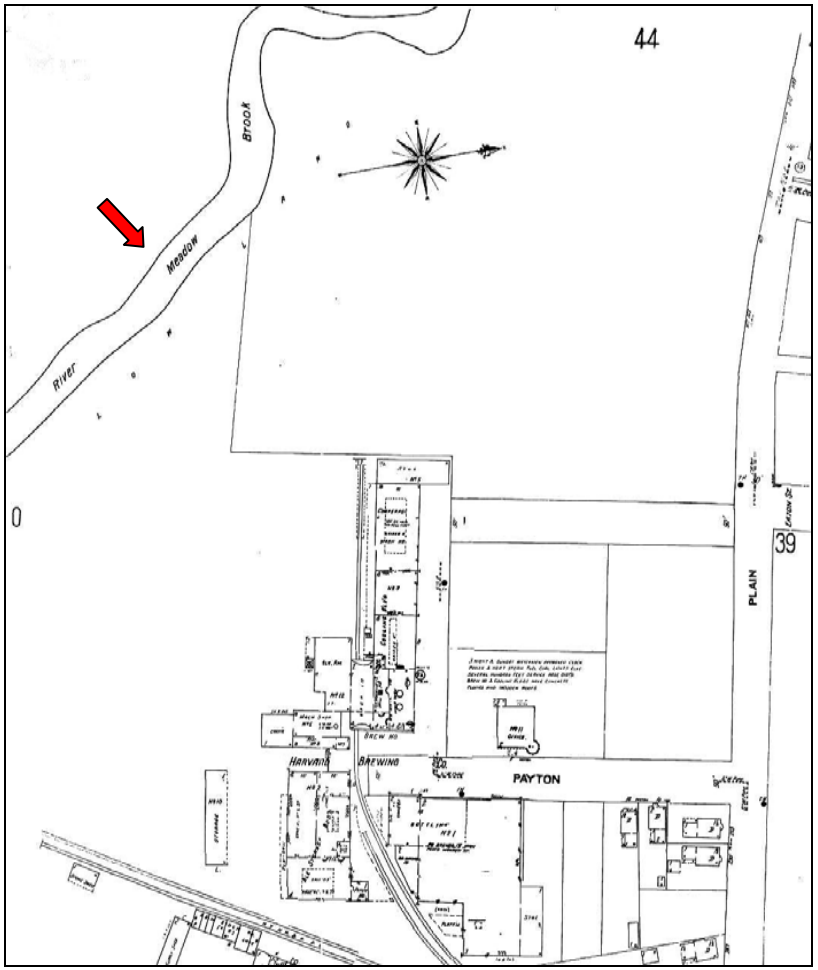
[314] See "WPA Projects List 2900 Workers Here," *Lowell Sun*, January 14, 1938. Three residents living in multi-family house successfully sued the city for damages to their yard and garden, though the monetary award was quite small. These claims against the city are noted in a report on a city council meeting, *Lowell Sun*, September 21, 1938.

[315] "Approve Project for Cleaning Well Field," *Lowell Sun*, February 9, 1939. Through Thomas Garrity's efforts the city council agreed to appropriate about $175,000 more for the project. See "Garrity's Hale's Brook Project Awarded $568,000," *Lowell Sun*, May 11, 1939.

[316] For Guyette's objection to the dam removal and the city's response see the report on the city council meeting of June 20, 1939, in the Lowell Sun, June 21, 1939, and "Won't Interfere With Well Fields," *Lowell Sun*, June 16, 1939.



This detail from a 1936 atlas of Lowell shows the serpentine channel of River Meadow Brook near the Harvard Brewery prior to the WPA-funded project to dredge and straighten the stream.



The channel straightening work completed in 1938 (red arrow) may be seen in this detail from a Sanborn insurance map of 1950. The course of the brook was to be far more dramatically altered with the construction of the Lowell Connector highway project in the early 1960s.

William A. Callahan, the Public Works Commissioner for Massachusetts, led to Callahan's ouster. But this contest between the two men also slowed spending on the state's WPA projects.[317] A frustrated Thomas Garrity urged the city to initiate the work at the brook, but to no avail.[318] Nothing substantial would be done to alter the brook until the massive Lowell Connector project some 20 years later.

Struggle over Redevelopment

In the years after the Great Depression, Tanner Street suffered from arsonists, accidental fires, building demolitions, neglected property, and illegal dumping on vacant lots. At the same time the brook was similarly neglected and was subject not only to occasional grass fires set by fire bugs, but it was also frequently on the receiving end of illegal dumping of garbage, heavy junk, and various household and industrial chemicals, as well as used petroleum products.[319] But the most dramatic change to the brook and the landscape of Ayer's City occurred in 1960-62 when the Lowell Connector highway was constructed. The large-scale project encompassed not only the building of a limited-access, four-lane, divided highway, but also the rerouting and straightening of River Meadow Brook. Essentially the vastly altered brook was to serve as a drainage ditch for the modern roadway.

The Lowell Connector originated with a "master plan" in 1956 for a new highway extending from Lowell to Lawrence and Haverhill, and on to its juncture with Route 1 near Salisbury, Massachusetts. The plan for this highway, which would become Interstate 495, included a major arterial road that connected Lowell with the "new Route 3 expressway to Boston."[320] Through the efforts of Congresswoman Edith Nourse Rogers and her conferences with Anthony DiNatale, Commissioner of Public Works for Massachusetts, Lowell was awarded the Connector project in September, 1958.[321]

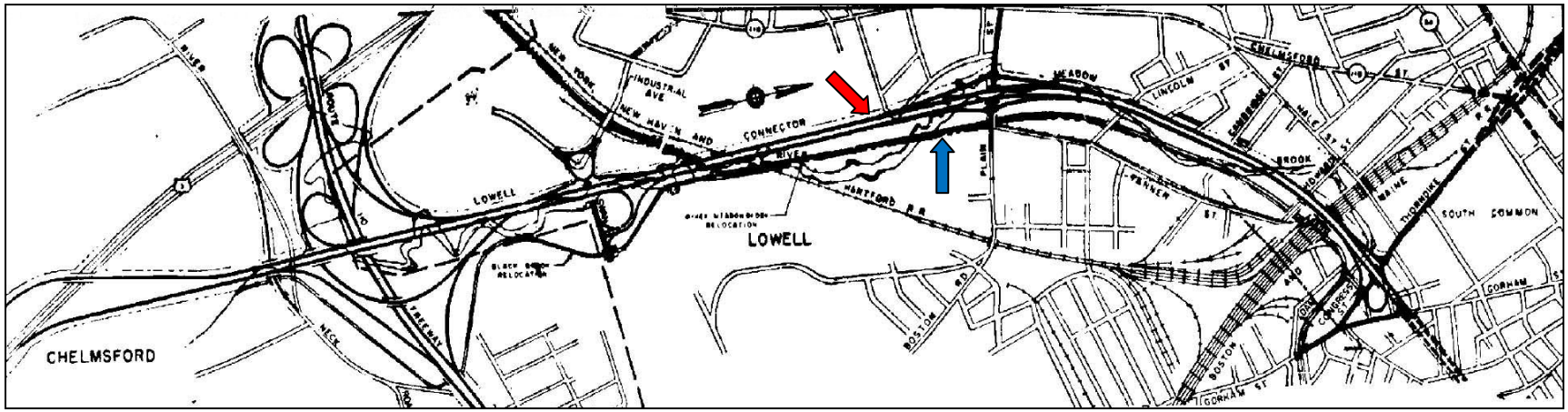
[317] A strike of WPA workers in Minneapolis, Minnesota, in July turned violent, resulting in the death of one police officer and a number of injuries to strikers and policemen. The strike in Lowell was peaceful, but it led to the delay of several projects. Although the strike in Lowell and elsewhere was settled, it marked the decline of the WPA program. It also became increasingly difficult for public works officials to hire competent workmen for WPA projects. See "WPA Strike Holds Here," *Lowell Sun*, July 12, 1939; "Congress Shocked By Killing of Policeman in W.P.A. Riot," *Lowell Sun*, July 11, 1939. For the controversy over Callahan and his dismissal see "Callahan Out as Public Works Head," *Lowell Sun*, July 26, 1939.

[318] At one of the final city council discussions on the River Meadow Brook project Garrity reaffirmed its importance and declared that the stream remained a health nuisance. The council responded by forming a committee to meet again with Dr. Paul Jackmauh the State Health Commissioner. This consultation did not lead to the startup of the work and the city dropped the project altogether. See the report on the city council meeting in the *Lowell Sun*, July 19, 1939, and "Hale's Brook Study," in the *Lowell Daily Courier*, July 19, 1939.

[319] The most serious fire, as noted earlier, occurred in 1956 with the burning of the Lowell Coal Terminal.

[320] "Plan Lowell-Route 3 Access in $90,000,000 Master Highway Plan," *Lowell Sun*, January 13, 1956. In this master plan the highway which would become I-495 was called the "Route 110 limited access expressway."

[321] The cost estimate for constructing the Connector amounted to more than 8 million dollars. See "We Win the Connector," *Lowell Sun*, September 14, 1958.



Above is the Lowell Connector (red arrow), as seen in this drawing from the Massachusetts Highway Department. It shows the route of the Connector and the rerouting of River Meadow Brook (the solid black line—blue arrow), erroneously labeled Black Brook. (Source: Lowell Sun, September 14, 1958.) Below is the Connector (yellow arrow) and River Meadow Brook (green arrow) as seen today.

This view of the brook from the Congress Street area looking north toward Gallagher Square was taken in the winter of 1961 during the rerouting of one additional section of River Meadow Brook. This work was done to make way for the highway ramps of the Connector at Thorndike Street. The wood-frame tenements (in the center) along Gorham Street were demolished. (Photo from the *Lowell Sunday Sun*, January 26, 1961.

The very first phase of the work comprised the relocation of River Meadow Brook, for which the state allocated $850,000. Work began in early 1959 and was completed in about one year. In addition to altering the course of the brook at the interchange between I-495 and the Connector, this project entailed the construction of a mile–long excavation for a ditch for the relocated stream in Lowell, along with the earthwork related to the filling and grading of the old streambed, above

The one section of the relocated River Meadow Brook containing a concrete lined channel is located at the rail crossing of the former Old Colony line near Howard Street. In the distance is the railroad bridge that spans the brook.

which the highway was built. All of the old bridges crossing the brook at Plain, Lincoln, and Howard streets were to be removed and replaced with new spans across the relocated channel.[322] The final part of the brook relocation work occurred in 1961 when the Gallagher Square section of the Connector was carried out. This was done in conjunction with the highway ramps for the Connector at Thorndike Street.[323]

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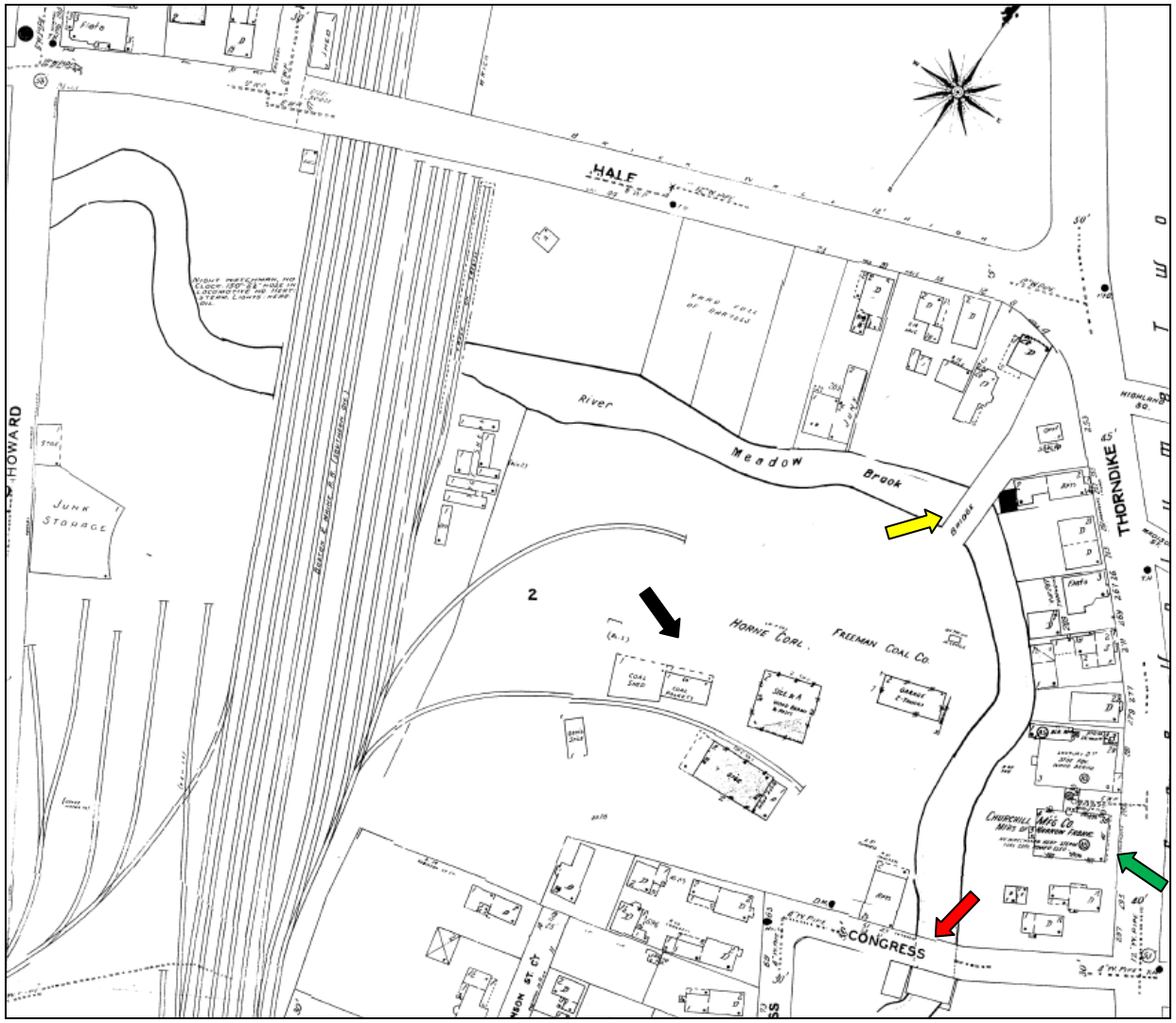
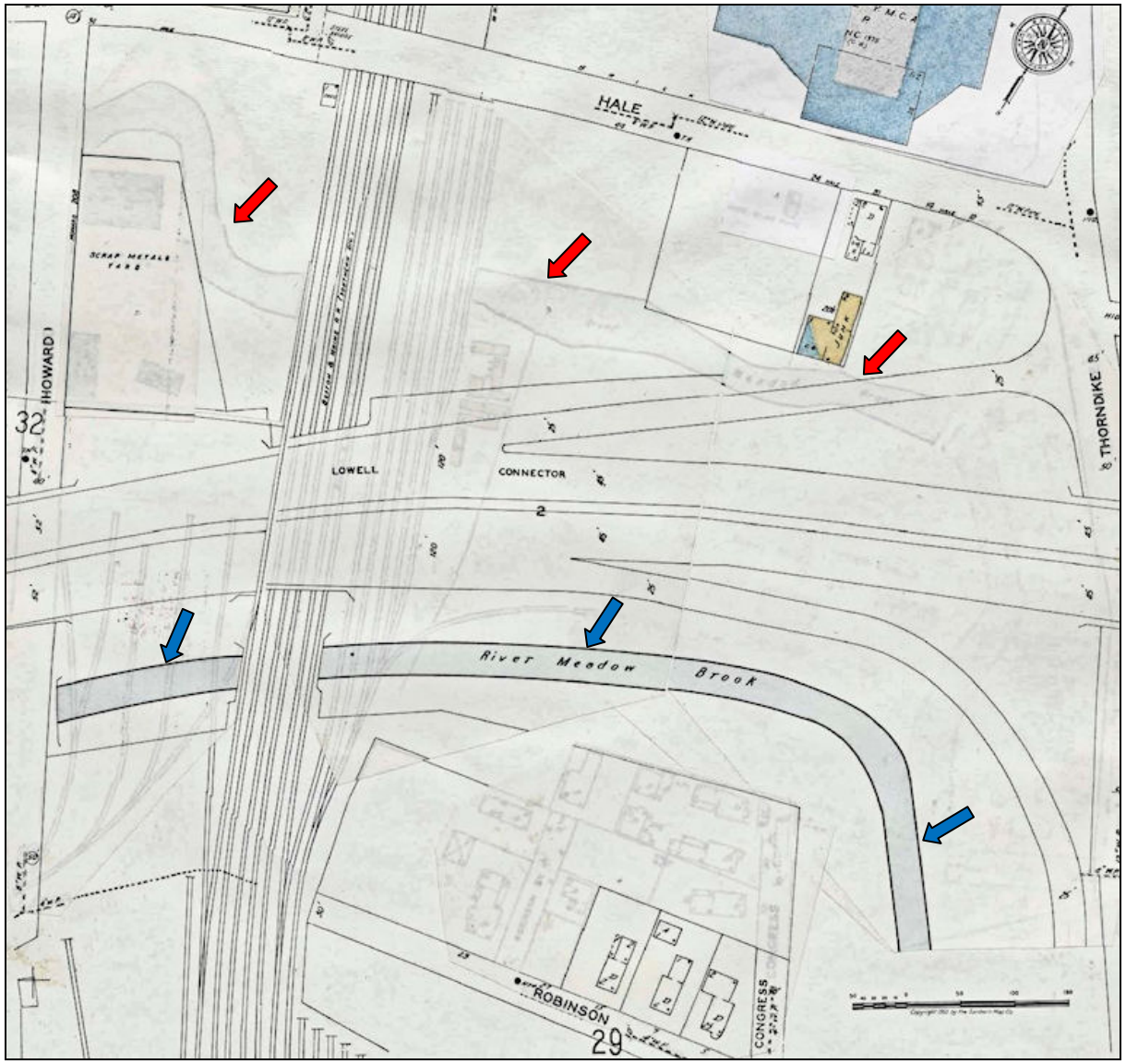
[322] While the federal government provided 90 percent of the funds for this part of the Connector project, the state allocated the remaining 10 percent. See "Seek Bids for Brook Project," *Lowell Sun*, January 7, 1959.

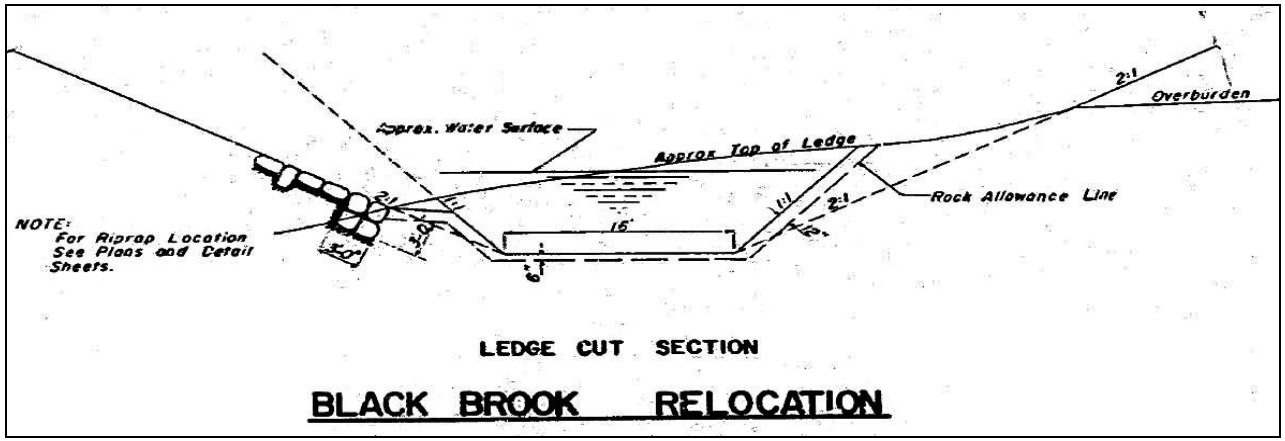
[323] "Changing Scene Along Upper Gorham Street," *Lowell Sunday Sun*, January 26, 1961.

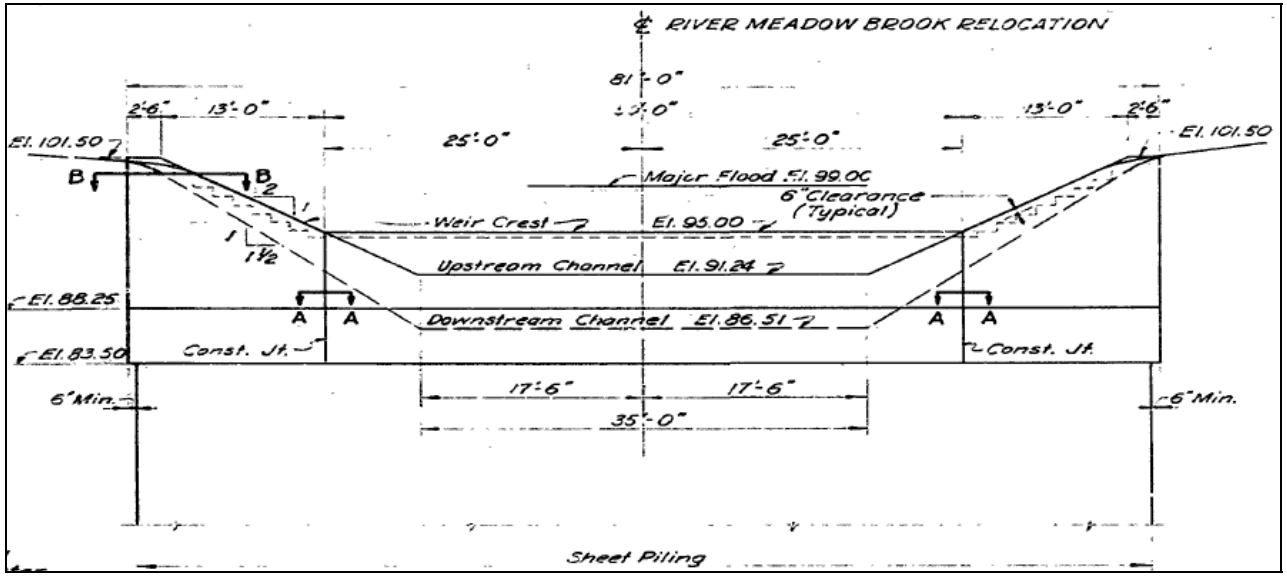


This detail from a Sanborn Insurance map of Lowell, drawn in 1950, shows River Meadow Brook about a decade prior to its relocation in conjunction with the Lowell Connector construction. The Horne Coal Company (black arrow), which was established in Lowell in 1834 and moved here in 1875, operated at this location until shortly before the highway's construction. Note that Congress Avenue crossed the brook (red arrow) and connected with Thorndike Street. A small privately owned bridge (yellow arrow) crossed the brook near Thorndike Street. A number of tenements and dwellings along Thorndike Street were demolished, as was the wood-frame factory building (green arrow) formerly occupied by the Churchill Manufacturing Company, a locally owned textile firm that produced narrow weave fabrics.



Changes to the landscape as a result of the River Meadow Brook relocation (blue arrows) and construction of the Lowell Connector may be seen in this map of the same area along Howard Street. The red arrows show the original streambed, which is faintly visible on this map from 1977. Residences at the northern end of Congress Street and along Robinson Court were torn down. In addition to demolishing a number of buildings for this major construction project, railroad sidings were removed as were two road bridges (one privately owned and the other that was part of Congress Avenue).



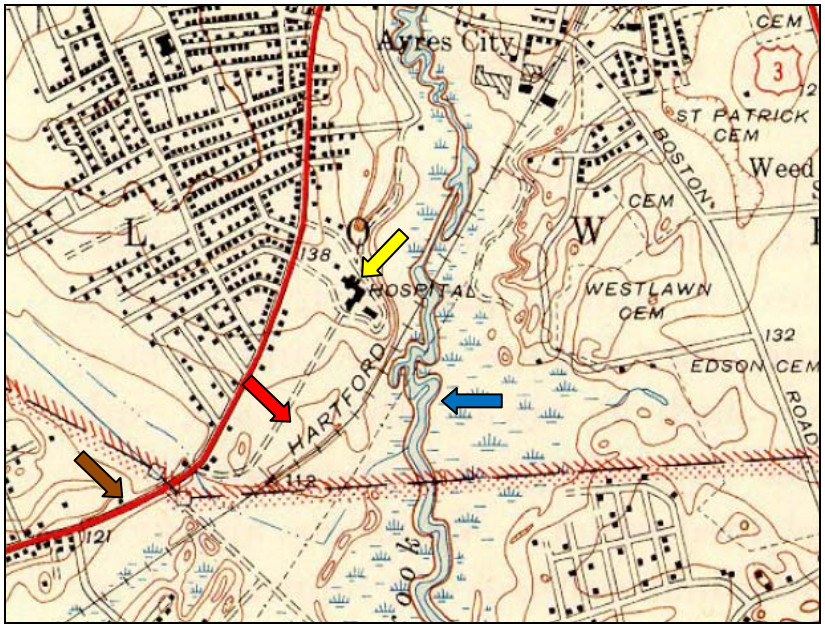


These two sections of the relocation of River Meadow Brook (erroneously labeled Black Brook) are from the engineering drawings of the Lowell Connector project produced by the Boston-based firm Edwards and Kelcey for the Massachusetts Department of Public Works in 1959. The detail (above) shows a typical cut section through soil and overburden. Note that the new channel was to be 16 feet wide at the bottom with gradual sloping on either side.

The detail (below) shows a section of the relocated channel where the old Hale's Mill dam was to be rebuilt. Note that the channel here was to be 35 feet wide at the base and that the crest of the new dam (labeled a weir) was to have an elevation of about nine feet above the downstream channel of the brook.

The channel of the relocated brook was constructed with a uniform width of 16 feet at the base of the streambed and gently sloped with stone rip rap and earth embankments. The width between the stream banks varied from 40 to 50 feet. Contractors planted grass on either side of the brook. The one exception to this was the area where the New York, New Haven & Hartford Railroad (the Old Colony Line) and the Boston & Maine Railroad crossed the brook in the vicinity of Howard Street. At this location concrete retaining walls and a concrete-lined channel were constructed and a massive multi-track railroad bridge was built. Just beyond the railroad bridge, where River Meadow Brook curves to the east and south, and begins its descent to the Concord River, the stream's channel was configured to create a more uniform arc. A short distance above the dam along Gorham Street, the relocated brook rejoined the original streambed. The old Congress Avenue bridge, which extended across the dam, however, was removed.

For Lowell's political and business leaders, the Connector was to serve as a key element in the economic revitalization of the long-struggling city. The city established a planning department in 1954 not only to oversee municipal projects, but also to coordinate the urban redevelopment work of the Lowell Development and Industrial Commission (LDIC), a public-private partnership launched in 1951.[324] Dominated by local banking and business interests, the LDIC quickly became the



Begun in 1953 the Lowell Industrial Park marked the first major post-World War II industrial development in Lowell. As seen in this detail from a U.S. Geological Survey map from 1941, land for this industrial park (red arrow) was located off Chelmsford Street, or Route 110 (brown arrow). The developer, New Industrial Plants Foundation, Inc., obtained land from the city and its poor farm, which was named the Farris Memorial Hospital in 1947 (yellow arrow). This property extended along the New York, New Haven & Hartford Railroad and was bordered to the east by River Meadow Brook (blue arrow).

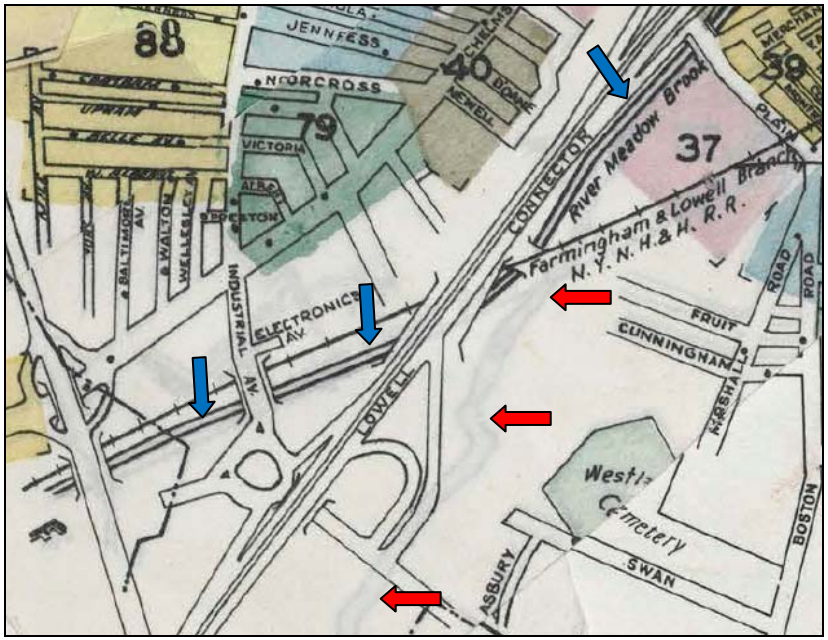
city's most powerful redevelopment organization.[325] LDIC board members and its executive director worked closely with

[324] Mehmed Ali, "The City as Protagonist," unpublished paper at the Lowell National Historical Park Library, pp.7-12 & 16.

[325] Proposed by city councilor Bradford Morse, who would succeed Edith Nourse Rogers in the U.S. House of Representatives, the LDIC, similar to

state and federal elected officials to land the Connector project. In addition, the LDIC oversaw the development of large parcels of municipally owned lands for new industrial parks; and promoted the removal of "blighted" neighborhoods where there was a high density of run-down housing and where the most impoverished people lived.

One of the earliest LDIC projects, the Lowell Industrial Park, which was located off Chelmsford Street on part of the city's poor farm property, predated the Connector. In 1952, members of the LDIC, including Lowell banker Homer Bourgeois, formed the New Industrial Plants Foundation, Inc., and purchased 110 acres of property in Lowell and Chelmsford, which extended east and south from Chelmsford Street to River Meadow Brook.[326] Surveying of the land for a new road,



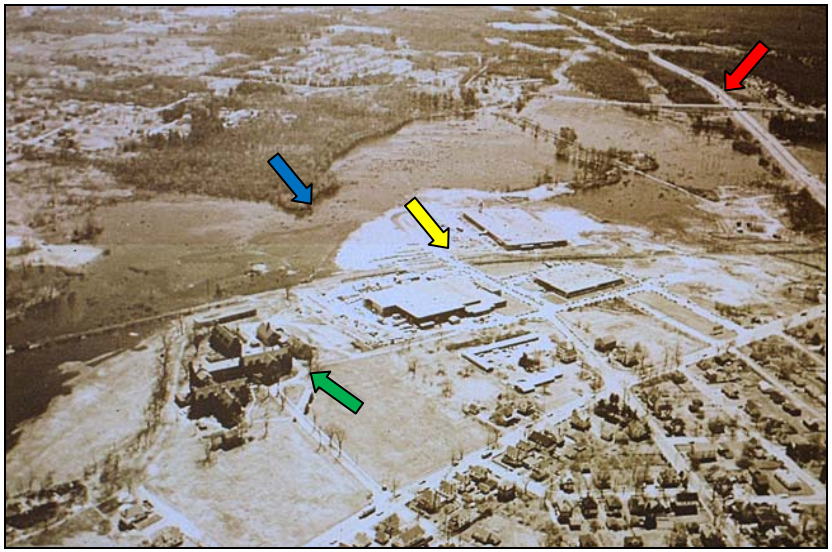
This detail from a 1977 atlas of Lowell shows the relocation of River Meadow Brook (blue arrows), which flowed through the Lowell Industrial Park, along Industrial Avenue, after its streambed was rerouted. Before the Connector's construction the brook's course, faintly visible on this map (red arrows) was to the east of the industrial park. (Atlas available at the Center for Lowell History.)

Lowell's "Industry Committee," established some 25 years earlier, was composed mostly of members from the city's banking and business community, but also had representatives from labor as well as educators. The city provided the LDIC funds to hire an executive director who sought state and federal redevelopment grants, extended opportunities for businesses to relocate to Lowell, and helped identify municipally owned and privately held properties as sites for new construction. "LDIC Sparked Industrial Revival in the City of Lowell," *Lowell Sunday Sun*, December 3, 1967. One of the prominent members of the LDIC was Menas Barsorian, co-owner of the Wamesit Power Company and chairman of the LDIC board in the late 1950s.

[326] In 1952 the city of Lowell sold part of the poor farm property to the New Industrial Plants Foundation for $900. See Northern Middlesex Registry of Deeds, v. 1210, pp. 492-493. Bourgeois led the formation of the New Industrial Plants Foundation, Inc., which was a for-profit development company. The corporation began with 25 Lowell businessmen each investing $5,000 in corporate shares with additional funds provided by Bourgeois' Union National Bank. See Theodore K. Pasma, *Organized Industrial Districts: A Tool for Community Development*, (Washington, DC: 1954), pp. 80-81. Among the incorporators were Joseph Pellegrino, Sr., of Prince Pasta and Thomas F. Costello of the *Lowell Sun*. A number of these businessmen were also affiliated with the LDIC. For a list of these men and their companies see "A New Day," *Lowell Sun*, May 21, 1953; and "Lowell Money to Make More Jobs in Lowell," *Lowell Sun*, May 15, 1956. Given Costello's connection to the *Lowell Sun*, it is not surprising that the city's sole newspaper was a zealous supporter of the New Industrial Plants Foundation as well as the LDIC.

named Industrial Avenue, and sewer lines began in November. And in May, 1953, just before the completion of the one-story, 42,000 square-foot building, CBS Hytron, an electronics manufacturer, bought the factory.[327] Flushed with this success, the New Industrial Plants Foundation constructed two more factory buildings in the industrial park. One, completed in 1954, was sold to a refrigeration technology manufacturer, and the other, which was finished in 1955, was purchased by a company that produced plastic laminates.[328]

By 1956 the companies in the Lowell Industrial Park employed over 800 men and women. The LDIC sought further expansion in the "outer belt of Boston," inspired by the growing electronics and aerospace industries located along Route 128 that increasingly relied on modern highways and trucks for transportation needs. In conjunction with the Connector project, Lowell's business leaders lobbied for a highway interchange at the industrial park to permit direct access in and out of the plants.[329] With pressure from local politicians and



This aerial view, dating from ca. 1959, shows the construction of I-495 (red arrow) and River Brook (blue arrow), during a period of high water and prior to its relocation and straightening, in conjunction with the building of the Lowell Connector. The Lowell Industrial Park (yellow arrow) is seen in the center and the Farris Memorial Hospital, formerly called the city's poor farm (green arrow), is to the left. (Photograph courtesy of Kim Zunio, Lowell Historic Board, city of Lowell.)

Congresswoman Rogers, the state highway department included in its design highway ramps at Industrial Avenue. Construction at this locale entailed not only the Connector and the associated ramps, but the rerouting of River Meadow Brook, which brought the stream channel directly through the industrial park.

One other major change to the landscape that occurred just prior to the Lowell Connector's construction was the

[327] A subsidiary of the Columbia Broadcasting System, this firm produced electronic tubes and transistors primarily for radios and televisions. "CBS Buys New Lowell Plant; Will Hire 1,000," *Lowell Sun*, May 20, 1953.

[328] The second factory completed was similar in size and design to the CBS Hytron plant. The Cambridge Corporation, affiliated with the Carrier Corporation and Arthur D. Little, Associates, purchased it in 1954. Plastics manufacturer Reiss Associates acquired the third building in the industrial park in 1955. For a celebratory overview of this industrial development see "Lowell Industrial Park Opens Door to Great Progress in This Section [of the City]," *Lowell Sun*, November 11, 1956.

[329] "Lowell's Industrial Location Stresses Ease of Access," *Lowell Sun*, September 27, 1959; "Call for Bids on Lowell $2,733,943 Connector," *Lowell Sun*, December 29, 1959.

demolition of the city's poor farm buildings and hospital. For several years, beginning in 1953, the poor farm, renamed Farris Memorial Hospital in 1947, operated on land next to the Lowell Industrial Park. In July, 1958, the city council agreed to sell, for one dollar, the remaining poor farm land to the New Industrial Plants Foundation. The foundation, directed by Newell L. Foster, who was a partner in the Fred C. Church Insurance Company, and Homer Bourgeois, foundation president, pushed for this land acquisition to expand the industrial park.

Their prize was the Courier-Citizen printing company, which had its plant on Jackson Street near the downtown, and reportedly planned to build a much larger printing plant in the industrial park. Other promoters of the closing and demolition of the hospital claimed that the facility "was a somber institution which had outlived its usefulness over a half century ago" and that the "buildings were an eyesore and disgrace to the city of Lowell."[330] The city council had voted by a narrow 5-4 decision to shut it down and demolition began in late 1958. But before the hospital was razed a fire struck it and the large brick building, once praised for its architectural grandeur, was destroyed.[331] Despite clearing the site and promoting its development, the foundation soon discovered that the Courier-Citizen Company decided not to build a printing plant there. For many years the empty field was used as a carnival ground and for recreational baseball.[332]

In the 1960s, parts of Ayer's City experienced some new development. The most highly publicized commercial project was the building of a new shopping center off Plain Street in which a Sears & Roebuck department store opened in 1964. The developer, Star Properties of Lowell, Inc., purchased land next to the defunct Lowell Brewery from the New Industrial Plants Foundation and, after receiving a variance to build a commercial building in an industrial district, sold the property to Sears & Roebuck. In addition to 60,000 square feet of retail space, the "low-slung, steel frame and brick building" contained a warehouse area and offices. Near the Plain Street entrance was an automotive servicing center. When the store opened in the fall of 1964 "hundreds gathered to view the ceremony and to enter and shop at Lowell's newest department store."[333]

For Ayer's City the largest scale redevelopment project emerged in 1966 when the Lowell Development Authority (LDA), established in 1961 to oversee the planning and execution of Lowell's federally funded urban renewal efforts, proposed a major urban clearance initiative of the Hale-Howard neighborhood, which included a "rehabilitation" of

[330] "News on Farris Coming Soon?" *Lowell Sun*, April 11, 1958.

[331] Patients at the Farris Memorial Hospital were either transferred to nursing homes or were sent to the Tewksbury State Hospital. "Farris Memorial Abolished as City Dept. By Council 5-4 Vote," *Lowell Sun*, July 9, 1958; "Fire Destroys Farris Memorial Building," December 12, 1958.

[332] City Manager Frank Barrett, although disappointed in the failure to land a new Courier-Citizen printing plant at the site was glad to have the city rid itself of the poor farm and hospital. He had advocated its closing early in his tenure as city manager, which began in 1953. See "The Barrett Administration," *Lowell Sun*, November 3, 1961.

[333] "Sears Opens Doors to New Building," *Lowell Sun*, October 28, 1964.

Tanner Street.[334] The Hale-Howard project was the city's second "slum removal" effort of the post-World War II period, the other being the demolition and redevelopment of the "Little Canada" neighborhood, which was part of the "Northern Canal Renewal Area." Although the city encountered some community resistance to this project in 1963 and 1964, opposition to Hale-Howard and the proposed Tanner Street "renewal" was far more intense. Indeed, the protests voiced by several community organizations and neighborhood residents reflected a small but growing movement against a powerful coterie of businessmen and city officials who directed Lowell's redevelopment initiatives.

The first public confrontation occurred in May, 1966, at a city council vote on the Hale-Howard Area Renewal project. Nearly 200 opponents, many of whom were residents of Ayer's City, turned out at city hall to contest it, specifically the part that encompassed the Tanner Street rehabilitation. Among the speakers was a young faculty member at the Lowell Technological Institute, M. Brendan Fleming, who also had been a member of the LRA board. While Fleming supported a renewal project for the Hale-Howard area, stressing the need for improved housing for residents there, he vigorously denounced the inclusion of Tanner Street in the project. In front of a cheering crowd Fleming claimed that proposed redevelopment would cast out businesses along Tanner Street, including the junk yards, and displace homeowners and other property holders in Ayer's City. Fleming reiterated his contention that the city must focus on Hale-Howard, which was in dire need of improvement and not Tanner Street.[335]

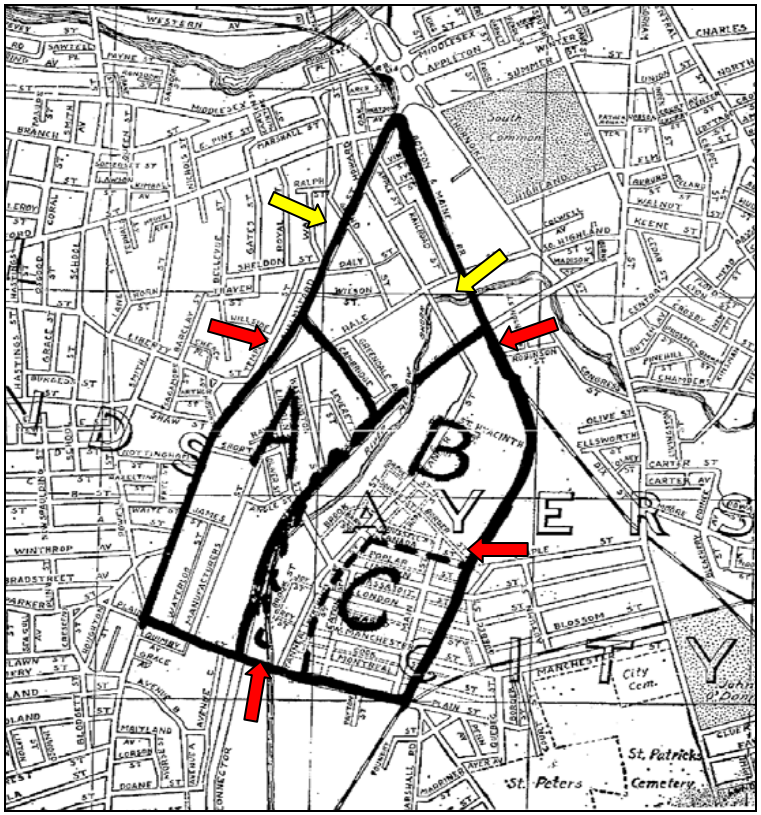
Residents of Ayer's City who spoke after Fleming decried the LRA's characterization of their neighborhood as a slum. "We

[334] The city council created the Lowell Development Authority in early 1961. In addition to a municipal employee who led the LDA, this agency was guided by a five-member board, appointed by the city council. These board members, in turn, elected its officers. The city vested the LDA with the power to develop plans and recommend redevelopment projects to the city council, which was then to vote either for or against the proposed project. The other key function of the LDA was to coordinate with community groups and hold public hearings on proposed urban renewal projects. At its inception the LDA focused on five major urban renewal projects that had been developed by the Lowell Housing Authority and the city's planning department. These included the Northern Canal Renewal Area and the Hale and Howard Street Renewal Area. The LDA's first director, John T. Sayers, Jr., was the son of the city's late chief of police and had worked as a planner in the Lowell Housing Authority. Among the board members was businessman John A. Notini, chairman, who would soon benefit from the Northern Canal project by building his company's office and warehouse in the project area. Rt. Reverend John T. Twiss, of St. Peter's Catholic Church, was also on the board and served as treasurer. See "Sayers May Head New Redevelopment Agency," *Lowell Sun*, April 20, 1961; "$30,000,000 Renewal Program for Lowell," *Lowell Sun*, February 21, 1961; "Lowell's Share of Northern Canal Job To Be $717,161," *Lowell Sun*, July 13, 1962.

[335] "Council Approves Ayer City," *Lowell Sun*, May 25, 1966. Dissent over the Tanner Street project had been brewing within the city council for months, leading up to the vote. The principal opponent was council member Richard P. Howe, but his criticisms of the project were strongly challenged by councilmen George F. O'Meara, Thomas J. O'Donnell, and John Cox. See "Ayer City Vs. Hale Street Projects Knotty Issue," *Lowell Sun*, February 11, 1966; "Hot Debate Involves Urban Renewal Project," *Lowell Sun*, March 9, 1966; and "Many Steps Led to City Council Vote on Tanner Street Project," *Lowell Sun*, May 29, 1966.

are not a slum area," proclaimed Daniel J. Simone of London Street, "we don't mind the junk yards and we don't want urban renewal. Give urban renewal to areas that need it, but not Ayer's City." The Reverend Samuel E. Starling of the Greater Lowell Council of Churches concluded his comments by urging that the "human needs" of Hale-Howard residents be considered and warning that, for those councilors who voted in favor of Tanner Street, they will be judged by "God almighty."[336] In spite of this spirited opposition the city council approved the Tanner Street project by a vote of 5-3. Public debate continued, however, as the Hale-Howard project received more scrutiny within Lowell, as well as between federal and local officials. In the end the city council dropped the Ayer's City redevelopment. The City Development Authority, which had replaced the LRA, oversaw the five-million dollar Hale-Howard urban renewal work. The project was carried out in the early 1970s with the demolition of dozens of residential buildings, many in very poor repair.[337]

Concern over the appearance of Tanner Street, notably the unsightly junk yards and used car dealerships persisted beyond the fight over urban renewal in Ayer's City. In 1966, at about the same time that the Hale-Howard controversy surfaced, the



The boundary of the Hale-Howard project as originally proposed by the Lowell Redevelopment Authority in 1966 comprised the area delineated by the heavy black line (red arrows). The Tanner Street "rehabilitation" encompassed the areas marked "B" and "C". When work finally began in 1972, most of the demolition of housing and its replacement with industrial buildings occurred in the "diamond-shaped" area (yellow arrows) at the top. (Source: *Lowell Sun*, March 13, 1966.

city council passed a zoning ordinance that included stiffer regulations for junk dealers and scrap metal companies. By

[336] "Council Approves Ayer City," Lowell Sun, May 25, 1966.

[337] The city council's decision to terminate the Tanner Street project received only passing mention. See "Hope for Hale Howard Approval By Washington Within Three Months," *Lowell Sun*, November 4, 1966. It took several more years and additional studies before the federal government approved the Hale-Howard project. See "City Gets $5 Million for Hale-Howard Work," *Lowell Sun*, March 28, 1970; "Hale-Howard Receives Final Okay," *Lowell Sun*, December 18, 1970.

1970, the number of these businesses on Tanner Street remained about the same, but conditions there increasingly vexed a number of city leaders and planners. Donald Wagoner, who was recruited to move to Lowell in 1968 and serve as director of the City Development Authority, condemned the auto scrap industry in Lowell and called for its outright ban in the city. Referring to Ayer's City, Wagoner complained, "I don't feel the junk yards which line Tanner Street and which can be seen from the Lowell Connector give a very impressive picture of the city of Lowell." He added that "the Connector is the gateway to the city." A newspaper reporter also observed that the one constant in this area was "the smell of burning rubber and the sight of black thick smoke billowing from the [junk] yards."[338]

Facing such criticism and concerned with a steady stream of vandalism directed especially at used car dealers and junk yards, a group of businessmen and women along Tanner Street formed an association in the 1970s. They sought greater police protection and patrols in Ayer's City, along with street, lighting, sidewalk, and beautification projects.[339] With the exception of occasional complaints over illegal dumping into River Meadow Brook, little mention was made of the stream within Ayer's City. Even the periodic problems of flooded streets and property in the vicinity of the brook appear to have diminished after the stream's relocation in the early 1960s.[340]

The Silresim Disaster

Although over the decades Ayer's City residents faced various threats from floods, as well as from air and water pollution, the most significant environmental disaster occurred in the 1970s at the Silresim Chemical Corporation's plant on Tanner Street. Established in 1971 by John and Constantine Miserlis to reclaim petrochemical wastes, Silresim operated less than six years, but it created the most toxic wasteland in Lowell and EPA declared the five-acre property a Superfund site in 1983. As they were starting up the processing plant in early 1971, John Miserlis, an assistant professor of chemical engineering at Lowell Textile Institute, stated that he and his twin brother selected Lowell "because it's centrally located between Boston and New Hampshire and Maine," and that the Tanner Street site was near a "good highway and Connector" with a railroad spur extending into the property. Miserlis also noted that the existing facility "had pumps and storage facilities for 180,000

[338] "Would Ban Junk Car Operations," *Lowell Sun*, June 14, 1970. The city and state imposed restrictions on open burning in 1964, limiting auto junk dealers to 18 hours per week in which they were allowed to burn debris. "Lowell Firms Agree to Confine Open Burning to 18 Hours Per Week," *Lowell Sun*, January 16, 1964.

[339] The most active members were Claire Lima, Jerry Largay, and Jim Bond all of whom were involved in the used car business. "Tanner St. Businessmen Combat Vandalism," *Lowell Sun*, October 3, 1977.

[340] Severe flooding along River Meadow Brook occurred periodically prior to the stream relocation and straightening. Probably the most widespread flood occurred in the winter of 1886 when ice and water inundated parts of Ayer's City, and the Plain Street bridge was washed away. Although ice and water flowed over the top of the two dams on the stream and threatened the stability of the dams, each withstood the raging torrent. See "Railroads and Highways Cut by the Floods," *Boston Daily Advertiser*, February 15, 1886; and "A Mid-Winter Freshet," *Lowell Daily Courier*, February 15, 1886. Two damaging floods also struck Ayer's City in the 1930s. See "Flooded Cellar Problem Grows," *Lowell Sun*, April 18, 1933; Surplus Brook Water Floods Streets," *Lowell Sun*, March 6, 1934.

John Miserlis was an assistant professor in chemical engineering at Lowell Technological Institute when he co-founded Silresim (his last name spelled backward) with his twin brother Constantine in 1971. (Source: *Lowell Sun*, January 31, 1971.)

gallons." In fact, the Tanner Street real estate that they acquired was originally developed by Shell Oil in the early 1930s and then sold to the Carragher Brothers Oil Company in 1943.[341]

It was Constantine Miserlis who was also a chemical engineer and had worked for The Badger Company, Inc., a Cambridge, Massachusetts, a firm that designed chemical processing plants, who developed the plan for the Tanner Street refinery for recycling industrial wastes and producing lubricants, as well as solvents. The Miserlis brothers pointed out that their company offered a safe environmental alternative to the dumping of industrial byproducts into streams or landfills, or polluting the air by burning these wastes.[342]

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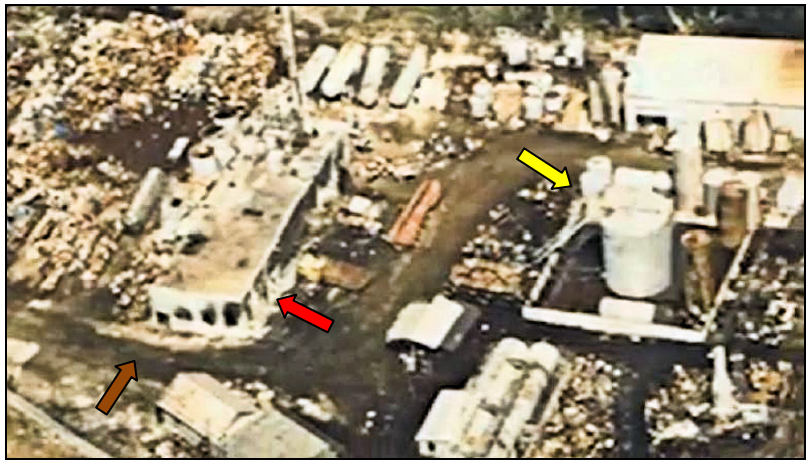
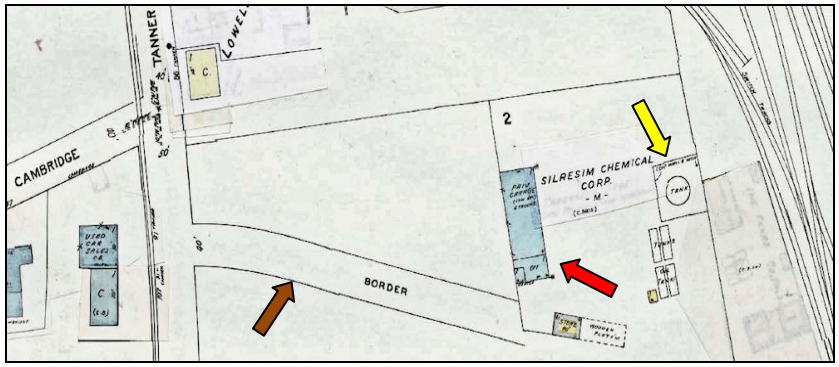
[341] Shell Oil purchased this property from Philip L. Scannell of the Scannell Boiler Company in 1929. Some years earlier, in 1914, the Texas Oil Company built a storage facility on part of this property. Scannell Boiler appears to have used another section of this property along Border Street, a dirt road off Tanner Street, as a storage yard. See the Lowell atlas of 1906 and the Northern Middlesex Registry of Deeds, v. 784, pp. 208-209; Herbert L. Carragher of the Carragher Brothers Oil Company acquired it from Shell in 1943. Northern Middlesex Registry of Deeds, v. 994, pp. 343-344. Constantine Miserlis and his younger brother Christo G. Miserlis, purchased the property from the Carragher estate in 1971. Northern Middlesex Registry of Deeds, v. 1947, pp. 31-32.

[342] The Miserlis brothers were the sons of Greek immigrants and grew up in Haverhill, Massachusetts. Their father worked in a Haverhill shoe factory. John Miserlis worked his way through school toiling in the Merrimac Paper Company's mill in Lawrence, Massachusetts, in the early 1950s. He taught at Northeastern University before he joined Lowell Technological Institute in around 1970. A younger brother, Christo G., was also a partner in Silresim when the Misleris twins began it in 1971. See the federal census of Haverhill, Massachusetts, 1940; Lawrence city directory, 1952; Lowell city directories 1965 & 1970; "A Refinery in Lowell, You Say?" *Lowell Sun*, January 31, 1971.



The aerial view of the Silresim site after the company abandoned it in 1977 shows the extent to which barrels of industrial wastes were strewn about the property. The garage, office, and laboratory building is to the left (red arrow) and the storage tanks and thermal oxidizing unit are to the right (yellow arrow). Border Street (brown arrow), was a dirt road leading to Tanner Street. (Sources: Aerial photo, above, from EPA; detail from 1977 Lowell atlas, below, from Center for Lowell History.)



Industrial wastes in metal barrels arrived at Silresim by rail and truck. The system used for processing these liquids during the first years that Silresim was in business is not known, because it was not until the fall of 1974 that the Miserlis brothers installed a thermal oxidizing unit, which enabled them to heat various volatile organic compounds and recover chemical solvents and oils.[343] The following summer the first of two serious fires occurred at the Silresim plant. In June, 1975, an explosion occurred in the barrel storage area at the site. None of the six men working at Silresim was injured and the Lowell fire department was able to contain the blaze.[344]

A second and more damaging explosion and fire occurred in October, 1977, when an electrically powered pump which was drawing sludge out of a pit sparked a blaze. Richard Wesinger, one of fifteen employees at the site when the fire broke out, remarked that flames quickly "shot into the air," and stated that "we all started running because [the plant owners] told us if a fire ever starts , just run." The fire burned out of control for nearly 20 minutes and threatened an adjacent storage tank, but the Lowell fire department arrived and quenched the blaze using water and chemical foam. None of the employees or fire fighters at the scene was injured.[345]

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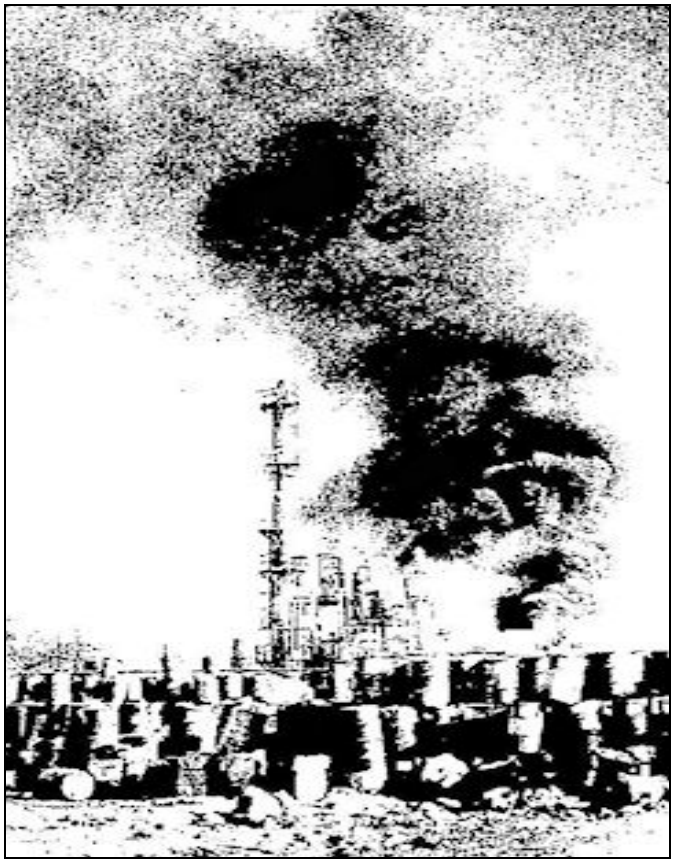
[343] A notice for the installation of a thermal oxidizer, which was approved by Lowell's Board of Health, appeared in the *Lowell Sun*, October 15, 1974.
[344] "From Day to Day," *Lowell Sun*, June 27, 1975.
[345] "Lowell Firemen Contain Raging Fire at Chemical Firm," *Lowell Sun*, October 22, 1977. A short circuit in a repaired electrically powered pump sparked the fire. "Fire Department Rules Fire Accidental," *Lowell Sun*, October 24, 1977.

Even before this second fire occurred Silresim was struggling not only financially, but also with the management of its operation. In fact, company officials were cited by the state for repeated violations of environmental laws, including the illegal discharge of contaminated wastes into city sewers. The state's Division of Water Pollution Control moved to close down the operation in 1976 because of the many citations and poor site conditions. But instead the agency reached an agreement with Miserlis and the Union National Bank, which held the company's mortgage, to modify Silresim's permit and tie it to a cleanup schedule and an improved operation.

Over the next several months Silresim disposed of some of the waste, though an undetermined amount this waste was dumped illegally. John Miserlis subsequently testified that the discharge of toxic chemicals, including toluene, through the city's sewers and into the Concord River (which flowed into the Merrimack River, the source of drinking water for Lawrence) was accidental. City and state officials, however, thought otherwise. They believed that Silresim employees were instructed to pump liquid wastes and sludge into a trench they dug that led to a city sewer inlet and that this dumping was being carried out during the early morning hours to escape detection.[346]

Many other state citations for pollution complaints against Silresim, dating from as early as 1973, were revealed during the company's bankruptcy hearing in late 1977.[347] But with the



A serious fire at Silresim occurred in October, 1977, shortly before the company declared bankruptcy. Barrels of industrial wastes are seen in the foreground. Beyond is the thermal oxidizing unit, which was near the sludge pit where the fire broke out. Thick black oily smelling smoke billowed from the pit before the fire was contained by the Lowell fire department. (Photo from the *Lowell Sun*, October 22, 1977.)

[346] "City May Have Found Toluene Culprit," *Lowell Sun*, December 25, 1977.

[347] "Lowell Company Had Long History of State Pollution, Odor Citations," *Lowell Sun*, December 29, 1977.

the company out of business the state assumed responsibility for containment and cleanup of the toxic wastes. Between 1978 and 1981, contractors working under the aegis of the state's Department of Environmental Protection and the Division of Water Pollution Control cordoned off the site and removed some 23,000 decaying barrels, as well as several large storage tanks. The cost amounted to nearly $3 million.[348] With the aid of additional funds from the EPA the site was then capped with clay and crushed stone, and then monitored for groundwater pollution.[349]

Neighborhood groups pushed for more information on the site's condition and pollution effects on residents and property in the surrounding area, as well as for swifter cleanup action.[350] A health study funded by the state and conducted by David Ozonoff of Boston University's School of Public Health found increased levels of respiratory problems, fatigue, bowel irregularities, and headaches among nearby residents in Ayer's City. And although Ozonoff believed there was correlation between the emissions of volatile organic compounds, pesticides, and polychlorinated biphenyls, and the ill health of residents, he concluded that "the question … remains whether exposure to chemicals from the waste site is the cause for this apparent increase in health problems among adults and children."[351]

Regulated Development in Ayer's City

While the Silresim disaster received the lion's share of public attention and concern, it was not the only Tanner Street site that was subjected to toxic chemical pollution by a company that reprocessed hazardous wastes. At a small plant bordering River Meadow Brook and located on the corner of Howard and Tanner streets, a firm named GeoChem, Inc., began operating in 1976 as a hazardous waste transfer station.[352] The GeoChem

[348] Another fire struck the abandoned plant in the summer of 1978, before the bulk of the remedial work began. It destroyed the laboratory, office, and warehouse. "Fire in Lowell Razes Chemical Storehouse," *Boston Globe*. August 21, 1978. For the remediation work funded by the state during the early years of cleanup see "Added Cleanup of Lowell Site Due to Begin," *Boston Globe*, August 9, 1983.

[349] The state and the EPA reached a monetary settlement with the companies that shipped wastes to Silresim and these funds covered some of the cleanup costs. John Miserlis and Lowell's Union National Bank, which held the mortgage to the Miserlis' property, were also required to pay restitution as part of the settlement .See "Firms Must Pay for Waste Cleanup," *Boston Globe*, September 22, 1983.

[350] Among the community leaders were Carol McCarthy of the Sacred Heart Neighborhood Improvement Group and Norine Brodeur of Lowell Fair Share. Some of their activities were reported in Ben Geman, "Wasted," *Boston Phoenix*, January 14-21, 1999.

[351] "Higher Rate of Ills Near Toxic Site, Study Uncertain on Link to Closed Plant in Lowell," *Boston Globe*, January 20, 1984. One resident who lived close to the Silresim property and helped lead the fight to remediate the site and investigate the health of her neighbors moved away, but many others remained. See Geman, "Wasted, *Boston Phoenix*, January 14-21, 1999."

[352] George E. Haggerty, a Chelmsford resident and salesman, founded GeoChem, Inc. and began operations on the corner lot at Tanner and Howard streets. At the time the D. T. Sullivan Company of Lowell, an oil furnace repair and building materials business, owned the property. Haggerty purchased the land and buildings, constructed of concrete and concrete block, in 1978. The sale of this property is noted in Northern Middlesex Registry of Deeds, v. 2289, pp. 726-727. In 1981 Haggerty sold the property to Vaughan Industrial Properties, Inc., a company he set up so

property, which was about one-sixth the size of the Silresim site, included a one-story wood-frame building, along Howard and Tanner streets, which housed an office and laboratory, a large drum storage space, and a distillation area, and a concrete-block building that housed a garage, waste handling, and storage facility. Under federal and state permits, Geochem was licensed to collect, transport, and store a number of hazardous materials, including oils, solvents, metal plating wastes, acids, and volatile chemicals. All of the transporting of hazardous materials was done using tanker or trailer trucks. Between 1978 and 1984, the state's Department of Environmental Quality Engineering (DEQE) issued several citations as a result of inspections or complaints.[353] The most serious, however, occurred in 1984 when the state shut down GeoChem for transporting and storing PCBs and pesticides, as well as treating cyanide wastes. The company's permit did not include the handling and disposing of any of these particular hazardous materials.[354]

Soon after the state took action against GeoChem George Haggerty sought a buyer for his company. His employees carried out the state ordered clean-up of the site, but it was not until 1986 that GeoChem was reorganized as Jet Line of Lowell, Inc., (later Jet Line Environmental Services, Inc.), a subsidiary of the Washington, D.C., firm, Basil Waste Management, Inc.[355] This marked the first in a series of ownership changes that occurred over the next two decades. Jet Line continued to use the Ayer's City building as a transfer facility for analyzing, treating, and storing hazardous wastes. But the DEQE suspended its license in 1987 for the illegal disposal of wastes at the Lowell facility.[356]

In a far more punitive action, the state ordered the closing of the plant for five years, beginning in 1997, because the company failed to correct a number of violations.[357] The

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that the property would no longer be in his name or his wife's. See Northern Middlesex Registry of Deeds, v. 2499, pp. 437-438.

[353] Goldberg-Zoino Associates, Inc., "Environmental Assessment, GeoChem Facility, 263 Howard Street, Lowell, Massachusetts," January 1985, unpublished report available via the federal EPA's website http://yosemite.epa.gov/r1/npl_pad.nsf/51dc4f173ceef51d85256adf004c7ec8/c25edf482209b0a185256c31005022b1!OpenDocument&Highlight=0,Lowell, accessed October 28, 2012.

[354] "Toxic Waste Firm Ordered to Shut Down," *Boston Globe*, May 3, 1984. At the same time GeoChem was fighting an indictment that it had illegally dumped barrels of hazardous materials at the Ottati & Goss/Kingston Steel Drum site near Kingston, New Hampshire. A federal judge in Concord, New Hampshire, ruled that the barrels deposited by GeoChem contained only trace amounts of hazardous wastes and dismissed the charges. See "Judge Dismisses Mass. Firm from Waste Suit," *The [Nashua] Telegraph*, July 27, 1984.

[355] Based in Stoughton, Massachusetts, Jet Line Environmental Services, Inc., had two branch plants, one in Lowell and the other in Dover, New Hampshire. For its acquisition of GeoChem see "Jet Line," *The [Nashua] Telegraph*, April 23, 1986.

[356] The violation stemmed from an improperly sealed underground containment catch basin that allowed hazardous liquids to seep into the soil and groundwater. Donald L. Corey, president of Jet Line, maintained that his company had sealed the catch basin after his firm had purchased the facility from GeoChem. See "Rejection By State Irks Two Cleanup Firms," *Boston Globe*, February 26, 1987.

[357] "State Shuts Down Lowell Waste Site," *Boston Globe*, March 7, 1997. Jet Line had entered into EPA's Voluntary Corrective Action Program in 1995, but the federal agency determined that the company had failed to meet the terms set forth in the agreement and terminated its participation in the program. Interestingly, Donald Corey, former Jet Line president and a

following year, however, in yet another corporate reorganization, Jones Environmental Services (Northeast), Inc., a subsidiary of Veridium Environmental Corporation with headquarters in Plainville, Connecticut, acquired the outstanding stock of the former GeoChem company.

Led by CEO James Green, Jones Environmental received an interim license from the state and resumed operations at the Lowell facility in November, 1998. In 2006 the EPA approved the corrective measures taken at the site by Jones Environmental that were based on investigations conducted by the Massachusetts Department of Environmental Protection (DEP). The DEP issued a series of directives to clean-up the facility and properly operate it.[358] More recently, the Somerville, Massachusetts, based company Triumverate Environmental Corporation acquired the property and currently operates the Lowell plant. Thus far it has maintained a good record in its handling of hazardous wastes.

The actions of Massachusetts and federal agencies directed at the various firms that owned the Lowell facility, beginning in the 1980s, reflected a more vigorous regulatory role of the state in the attempt to guard against environmental problems like those, for example, at Silresim. In addition to this regulatory role of the state, a process for public hearings and comments on proposed commercial or industrial developments was legislatively instituted and more rigorously carried out. For Ayer's City residents these legally required environmental practices helped to defeat a proposed garbage transfer facility.[359] But not all industrial development in this locale was halted. In fact, one of the most significant additions to the landscape of Ayer's City was realized in the early 1990s with the construction of an 85 mega-watt (net capacity) natural gas-fired cogeneration plant on Tanner Street, across from the GeoChem property.

Developed and owned by L'Energia Limited Partnership, a Delaware corporation, the Tanner Street plant began commercial operation in early 1993. Originally L'Energia had entered an agreement with the Borden Corporation to build a cogeneration plant on the property of the Prince Pasta factory, but concern among nearby residents and some city officials prompted the power company to acquire land from the Scannell family on Tanner Street and build the plant there. Piping placed underground joined the cogeneration plant in Ayer's city to the Prince Pasta factory and L'Energia provided Borden the needed thermal energy for its pasta production.

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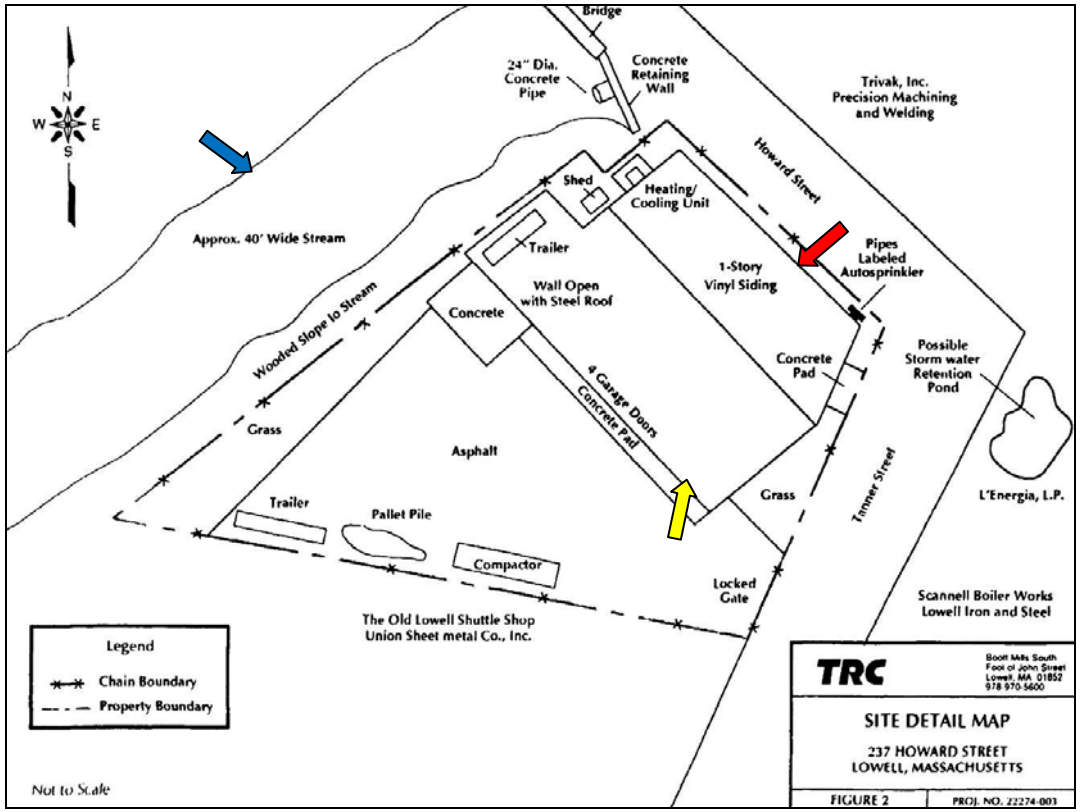
principal in the environmental firm Phoenix Environmental Services, Inc., produced the site condition study that the EPA required of participants in this program. See "Final Assessment Report, RCRA Corrective Action Program GeoChem, Inc., Site, Lowell, Massachusetts," [1995], unpublished report available via the federal EPA's website http://yosemite.epa.gov/r1/npl_pad.nsf/51dc4f173ceef51d85256adf004c7ec8/c25edf482209b0a185256c31005022b1!OpenDocument&Highlight=0,Lowell, accessed October 28, 2012.

[358] See U.S. Environmental Protection Agency, Region 1, "Statement of Basis for Corrective Action Completion Determination for Jones Environmental Services, Inc.," April 2006,], unpublished report available via the federal EPA's website http://yosemite.epa.gov /r1/npl_pad.nsf/51dc4f173ceef51d85256adf004c7ec8/c25edf482209b0a185256c31005022b1!OpenDocument&Highlight=0,Lowell, accessed October 28, 2012.

[359] "Proposals to Build Trash Processors Irk Lowell Neighbors," *Boston Globe*, February 1, 1998.



For this drawing produced by the Lowell environmental firm TRC see the federal EPA's website http://yosemite.epa.gov/r1/npl_pad.nsf/51dc4f173ceef51d85256adf004c7ec8/c25edf482209b0a185256c31005022b1!OpenDocument&Highlight=0,Lowell, accessed October 28, 2012.

The drawing of the GeoChem site was produced in 1998 by the Lowell environmental company TRC. It shows the original wood-frame building (red arrow) that served as an office, laboratory, and storage facility, and the concrete-block building (yellow arrow) containing a four-bay garage and storage and handling facility. River Meadow Brook (blue arrow) runs along the northwest side of the property.

Electricity produced by a Siemens V64.3 gas turbine and generator unit was connected to the New England Power Company's grid and sold to Boston Edison Electric and to the Massachusetts Municipal Wholesale Electric Company.[360] Borden's closing of the Prince Pasta factory in 1998 dealt a financial blow to L'Energia. And the income derived from selling electricity through the grid outpaced the plant's operating costs, which were increasing, especially in the wake of rising natural gas prices.

In 1999 L'Energia's properties in Lowell were transferred to its partner firm United American Energy Corporation (UAE), which was based in Woodcliff Lake, New Jersey, and it ran the Tanner Street plant under the name UAE Lowell Power, LLC.[361] UAE sought to improve the financial condition of it

The cogeneration plant, formerly of L'Energia Limited Partnership and now owned by Montgomery Energy Partners, LP, of Houston, Texas, is seen from Howard Street, looking east toward Tanner Street.

Lowell plant by doubling its size. While planning this addition, UAE's vice president, Stephen P. Strait, attempted to negotiate an annual payment to the city, in lieu of a property tax. Lowell's city council and the city manager, John Cox, believed the amount Strait offered was inadequate. Failing an agreement

[360] For L'Energia's purchase of the Scannell property see Northern Middlesex Registry of Deeds, v. 5470, pp. 170-173; "High Temperature Turbine Breaks Ground in the U.S.," *Modern Power Systems*, v. 11, (October 1, 1991): pp. 21-25.

[361] L'Energia Limited Partnership was established in 1991 specifically for the Tanner Street cogeneration project. Its main partner, UAE, was formed in 1983 out of the reorganization of the United American Hydropower Group, established three years earlier by David Goodman, a civil engineer and businessman, and brother of the slain civil rights activist Andrew Goodman. UAE specialized in the acquisition and management of electrical power generating properties notably those that used renewable energy sources, including municipal garbage. For background on UAE see "United American Energy Holdings (UAE), Developer, Acquirer, and Operator of Power Facilities, Has Entered into a Merger Agreement with DLJ Merchant Banking Partners III," *Power Engineering*, (November 1, 2003). For the transfer of the Tanner Street property to UAE see Northern Middlesex Registry of Deeds, v. 10124, pp. 17-21.

UAE ended its expansion plans and in 2003 it ceased running the plant.[362]

Ayer's City residents learned of a proposal for a new natural-gas fired power plant in early 2006, despite the fact that the Tanner Street cogeneration station remained shut down. Lowell Power Generators (LPG), a partnership between the Barletta Construction Company of Canton, Massachusetts, and DG Clean Power, LLC, of Thornton, New Hampshire, filed an application with the state and with FERC to construct a 98 megawatt powerhouse, for operating during peak electricity demands, on land adjacent to the Tanner Street power plant. This occurred at about the same time that LPG acquired the former L'Energia plant and proposed an even larger electrical generating powerhouse in Billerica.[363]
Although the deregulation of electric utilities created a less favorable financial climate for smaller-scale cogeneration plants, it spurred the development of electrical generating powerhouses that could sell electricity through the power grid.

While only a few residents in Ayer's City objected to the new plant in Lowell, local opposition was far more intense to the proposed Billerica project.[364] Joseph F. Fitzpatrick of DG Clean Power and a former Lowell city councilman led in the negotiations with state and local officials, but in the end he and other LPG investors decided to postpone indefinitely construction of the two plants.

Their decision centered on a less favorable market for peak-demand powerhouses rather than community resistance.[365] Nonetheless, plans to improve the Tanner Street plant moved ahead and Montgomery L'Energia Partners, LP, of Magnolia, Texas, which purchased the property in 2007 removed the Siemans turbine and installed a new 58 megawatt turbine-generator unit. Manufactured by Rolls-Royce, the Trent 60 turbine was among the first to run in the United States when it was placed in operation in 2008. The turbine could be fueled by natural gas or oil.[366] Currently run during periods of peak

[362] UAE was paying the city of Lowell over $500,000 each year for a 10-year period for the original cogeneration plant and the company proposed an additional $100,000 for the expanded powerhouse. "Power Plant Expansion Runs Out of Steam," *Lowell Sun*, 20, 2002. In 2003 the private equity investment company DLJ Merchant Banking Partners, which was associated with Credit Suisse First Boston, acquired UAE. This marked the end of UAE

[363] LPG paid $4.2 million for the property in 2006. Northern Middlesex Registry of Deeds, v. 20473, pp. 53-58. At the time of LPG's acquisition the Tanner Street plant was held by Lowell Liquidating Power LLC, which took over the assets of Lowell Power, LLC, when it filed for bankruptcy in 2005. See "Assignment for the Benefit of Creditors," Northern Middlesex Registry of Deeds," v. 20473, pp. 38-48.

[364] "Utility Seeks Support for Plant, Neighbors Wanted as Allies, Not Foes," *Boston Globe*, March 5, 2006. The Billerica plant was to be a semi-automated operation with the controls run by operators at the Tanner Street powerhouse. See "South Lowell Told Power Plant's Effects to be Minimal," *Lowell Sun*, November 20, 2008.

[365] "Fight Will Continue Over Proposed Power Plant," *Lawrence Eagle Tribune*, June 4, 2009. DG Clean Power gave up the Billerica project in 2010. See "Billerica Power Plant is Dead as Investors Walk Away," *Lowell Sun*, February 3, 2010.

[366] Montgomery L'Energia Partners paid $2.8 million to acquire the plant in 2007. See Northern Middlesex Registry of Deeds, v. 21672, pp. 180-182. For information on the restarting of the Tanner Street plant with its new turbine see "Lowell's L'Energia Plant Ready to Roar Back to Life," *Lowell Sun*, February 21, 2008.

demand, the plant with its pale green siding and its 160-foot tall stack is a visually dominant part of the landscape in the vicinity of River Meadow Brook.[367]

A New Ayer's City

The completion of the Lowell Connector in 1962 marked not only a severing of Lowell's Highlands neighborhood with the Sacred Heart Parish neighborhood. But the highway and the relocated River Meadow Brook, which now ran alongside the elevated, limited access road, ostensibly removed from view the once meandering, gently flowing stream. At the same time, the Connector exposed quite clearly one of the Lowell's most heavily industrialized and environmentally abused landscapes, the Tanner Street district of Ayer's City. Pointing out that the Connector served as the "gateway" to Lowell, city officials and boosters complained of junk yards, used car dealers, and burning refuse along Tanner Street that greeted travelers driving on the highway. And the original Hale-Howard urban renewal plan that included a redevelopment area in Ayer's City referred to this locale as "blighted."[368]

After pressure from local residents led to the rejection of the Ayer's City renewal project in 1966, the city turned its attention to planning and redevelopment initiatives in other parts of Lowell. It was not until 2001, in the wake of the Silresim disaster and with funds from the EPA, that the city's planning department examined in a comprehensive manner the Tanner Street district.[369] A concept plan, created by Chris Reed and his associates at Stoss Landscape Urbanism, called for a mixed commercial and industrial corridor. Although it does not appear that Stoss studied the jettisoned Tanner Street redevelopment plan from the 1960s, its recommended zones of heavy industry, light industry, commercial, and office use differed little from this earlier urban renewal proposal and reflected continuity rather than change.

The Stoss concept plan, however, was unique in several ways. First, it called attention to the long-neglected River Meadow Brook and proposed a system of terraced lands on either side of the stream with these terraces serving a "bioremediation" function to filter out wastes from surface runoff and from treated effluents flowing out of Tanner Street industries. Second, the Stoss plan called for an "EcoTech" park at the Silresim site to educate the public on the environmental history of the area, as well as on the science and technology of pollution cleanup. Third, Stoss infused the landscape design throughout the district with plantings, pedestrian paths, and

[367] The plant is currently owned by Tanner Street Generation, LLC, which in turn is controlled by EDF Trading North America. This parent firm, based in Houston, Texas, is a subsidiary of the giant Électricité de France S.A. (EDF SA), which is a French state-owned utility with headquarters in Paris, France. Tanner Street Generation purchased the Tanner Street property in 2011 for $18 million. See Northern Middlesex Registry of Deeds, v. 25083, pp. 231-233.

[368] A city council resolution in favor of the Hale-Howard project declared that Ayer's City was a "blighted area." Many residents strenuously objected to this description of their neighborhood and one leader of the opposition to urban renewal in the vicinity of Tanner Street, Claire Dowling, of West London Street, stated that more than 100 people would turn out at a city council hearing to speak against the initiative. See "Ayer's City Residents to Fight Urban Renewal," *Lowell Sun*, May 21, 1966.

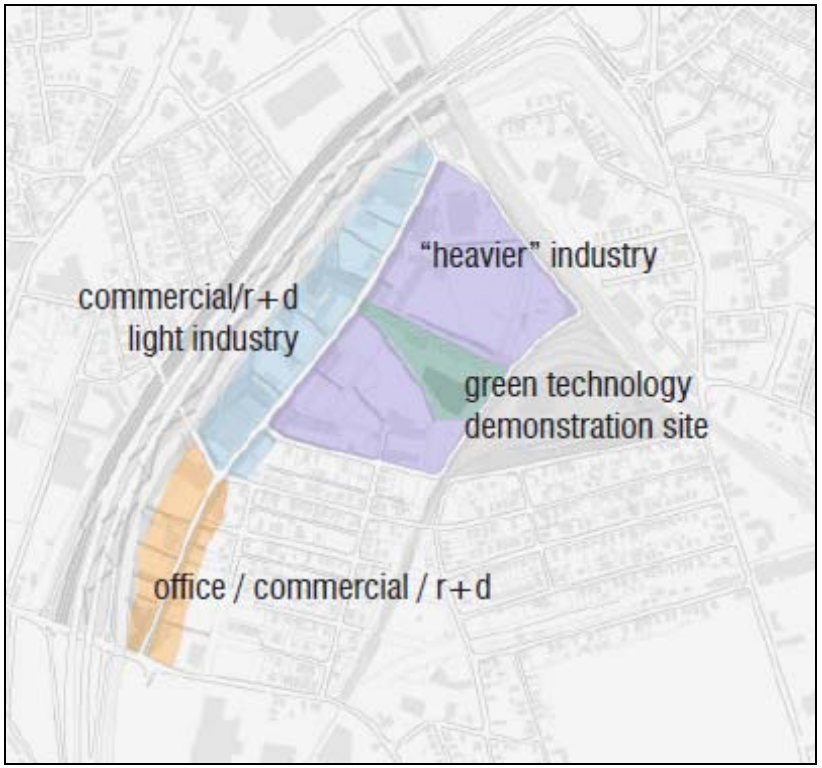
[369] "Tanner Street Turnaround, City Looks to Turn Industrial Area into Recreation Center," *Lowell Sun*, December 8, 2001.

The Stoss plan proposed a series of "bioremediation terraces" along River Meadow Brook, and it included this rendering of a pilot terracing project to be located across from the Silresim site. Source: Note, as well, the plantings around an industrial property on Tanner Street that was to serve as a "landscape screening" element. Stoss Landscape Urbanism, "Silresim Superfund Redevelopment Study: Tanner Street Initiative, Lowell, Massachusetts," September, 2002.)

architectural elements that either highlighted remediation efforts or enhanced the appreciation and use of reclaimed "green spaces."[370]

In 2004 the Stoss concept plan won an award from the American Society of Landscape Architects for its analysis and planning work. Nevertheless, the city endorsed only a few of the proposals, including a "landscaped screen" to create a visual barrier between the Lowell Connector and Tanner Street. Moreover, it failed to embrace the most ambitious pieces, namely the bioremediation terraces, the Eco-Tech park idea, and the network of paths, recreational, and educational green spaces.[371] The reasons noted were the expense and difficulty in acquiring private land within the district and the concern for using land zoned as industrial for park and recreational purposes.

Despite not moving forward with any of the Stoss recommendations, the city continued to oversee further



The Stoss plan highlighted three broad categories of land use in the Tanner Street District that were not markedly different from earlier urban renewal plans. But integrated into these areas was a network of green spaces, pedestrian paths, and a park at the Silresim site, noted above as the "green technology demonstration site." (Source: Stoss Landscape Urbanism, "Silresim Superfund Redevelopment Study: Tanner Street Initiative, Lowell, Massachusetts," September, 2002.)

remediation work at the Silresim site. With funds amounting to $20 million from the American Recovery and Reinvestment Act of 2009, EPA administered a project which used thermally

[370] Stoss Landscape Urbanism, "Silresim Superfund Redevelopment Study: Tanner Street Initiative, Lowell, Massachusetts," September, 2002, report available at City of Lowell, Division of Planning and Development.

[371] According to the Division of Planning and Development, "[the Stoss] proposal assumed that the city would acquire all the Tanner Street parcels for public uses. That is unlikely, for two reasons - one, financially that is difficult for the City, and two, Tanner Street is one of the City's few areas zoned and designed for light industrial and manufacturing. Keeping it as a business corridor would allow it to develop into a stronger economic engine for Lowell." See "Tanner St. Plan" on the website of the city's Division of Planning and Development, http://www.lowellma.gov/depts/officeofthecitymanager/responses-to-motions/2007-responses/2007attachments/tanner-st-plan/, accessed November 3, 2012.

enhanced soil vapor extraction (SVE) technology with electrical resistive heating (ERH). Developed in the early 1990s this method of removing hydrocarbons and volatile organic compounds from soil had been designed for the Silresim site in 2008. This design entailed the use of conduit driven into the ground and provided with electrical current to heat the subsoil up to 100°C thereby releasing organic vapors which could then be captured in condensers and treated. The ERH process offered the advantage of increasing the rate of removing hazardous organic chemicals compared to older recovery well and water treatment technology (which had been installed at the Silresim site in 1995). EPA awarded Nobis Engineering, Inc., of Lowell a contract for constructing and operating the SVE system in 2010 and the work was completed the following year.[372]

In connection with this most recent work at the Silresim site, the city received a $175,000 "Brownfields Areawide Planning Grant" from EPA to study, once again, the Tanner Street corridor. The city contracted with the landscape architectural and planning firm Crosby, Schlessinger & Smallridge to carry out the project. While the view of maintaining the area for heavy industrial use persists among some city officials and members of the business community, the consultants are also exploring opportunities for mixed commercial, recreational, and residential use. The extent to which this plan will influence the ecological future of the much abused and neglected River Meadow Brook remains to be seen.

[372] "New System to Speed Up Cleanup at Silresim Site in Lowell," *Lowell Sun*, August 16, 2011.

To the discerning eye, the extremely straight channel of the relocated River Meadow Brook along the Lowell Connector is evidence of the massive manmade alterations to the once meandering stream. Nevertheless, despite the stone-lined embankments and the occasional drain pipe that intrudes along the brook, the growth of trees and vegetation has helped soften the stark drainage-ditch appearance that was so pronounced when the highway was completed in the early 1960s.

Conclusion

Today much of the landscape along River Meadow Brook in Lowell remains unsparingly bleak. Remnants of the once heavily industrialized area concentrated in Ayer's City have been joined with a handful of newer steel frame, metal-sided manufacturing and warehouse buildings, with windowless

facades that lack any architectural quality or character. In contrast, however, a large number of mostly wood-frame houses, dating from the late 19th and early 20th century, are clustered around the lower section of the brook or line the streets that climb the surrounding hillsides. Below the dam at Gorham Street, the brook possess a decidedly different character, with modest rapids flanked by steeper ravines and tree-lined banks as the stream flows toward its mouth at the Concord River. En route it passes by the site of the historic Lowell Bleachery and the older brick factory buildings that were once associated with the Wamesit Power Company.

The most dramatic change to brook occurred in the early 1960s when the Lowell Connector blasted through Ayer's City and highway engineers rerouted much of the stream, using the straightened channel as a diversion ditch for runoff from the four-lane, divided roadway. While this major alteration to the landscape stemmed from a large-scale public-sector project, it was private industrial capitalistic development, dating largely from the 19th and early 20th century, which reshaped much of the earlier agrarian and natural environment. Occasionally this control of the land by real estate speculators and industrial capitalists resulted in some very destructive practices that severely injured the area's ecology. Today's residents, as well as the flora and fauna in the vicinity of the brook, continue to feel the effects of these many decades of human use of the land and water.[373]

The more recent history of the River Meadow Brook watershed in Lowell attests to the often conflicting pressures of capitalist economic development and improved quality of life for residents in a long-suffering neighborhood. The future of this area will certainly be shaped by some, if not many, of the patterns of past decision making, as well as by long-standing relationships of political, social, and economic power. Clearly, many of the land use decisions resulted in, at best, short-term gains for some residents and non-residents alike, but, overall, the socio-ecological condition of this area has deteriorated. Curiously enough, however, it was largely a result of capital flight and the removal of industry that helped reverse the decades of degradation to the flora and fauna along the stream. Perhaps a more informed, knowledgeable citizenry and a responsive city government, aware of past decisions and the complex social economic relations that gave rise to these decisions of land use, will help alter past practices and lead to a healthier and more desirable place in which to live.

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[373] An EPA reported stemming from the Silresim Superfund site offers a highly critical assessment of the ecological character of River Meadow Brook as it flows through Ayer's City. The brook, this report states, "is classified by the Massachusetts Division of Water Pollution Control as a Class B stream and is therefore designated for the protection and propagation of fish, other aquatic life and wildlife, and for primary and secondary contact recreation. However, the water quality from upstream of the Silresim site to the Concord River does not comply with Class B standards. The brook is affected by upstream industrial discharge unrelated to contaminant plumes from Silresim. The banks are of marginal to wildlife and aquatic biota due to anthropogenic changes to the stream course and banks, the upstream discharges, and the general urban, paved and altered environments, adjacent to the stream bank. The potential use of the brook for recreational activities appears to be limited due to physical characteristics, degraded conditions, and observed dumping of trash and debris." See "Section II: Land Use" in the U.S. Environmental Protection Agency, "EPA Superfund Record of Decision, Silresim Chemical Corp., EPA ID: MAD000192393, OU 01, Lowell, MA," September 19, 1991.

Appendix 1: Important Historic Sites along the Brook

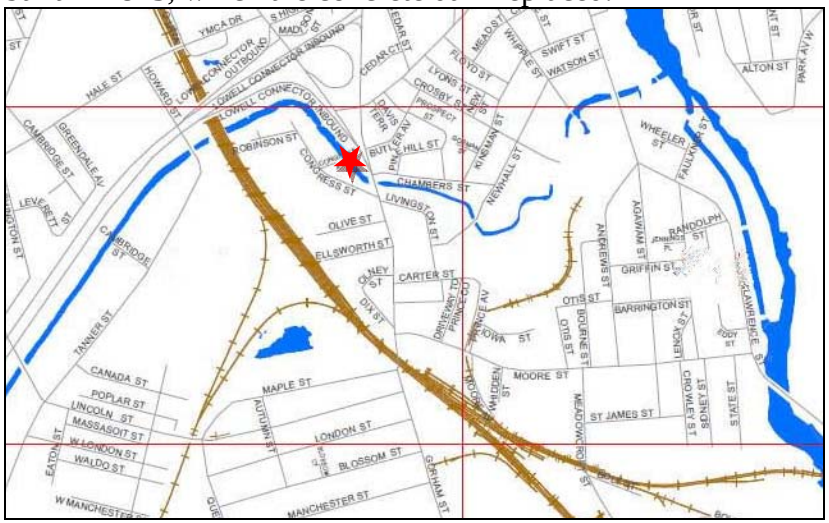
The major landscape features and historic structures located along or within the vicinity of River Meadow Brook are highlighted in this appendix. In general, the historical names are used to identify the structures or site. A description of the current features of each site is followed by a summary history. The sites are grouped according to the district in which they are located.

Hale's Mills District

Hale's Mills Upper Dam

Hale's Mills Dam, looking upstream from the west side of Gorham Street.

Description: The small reinforced-concrete gravity dam across River Meadow Brook along Gorham Street was built in 1961 as part of the brook relocation that was carried in conjunction with the Lowell Connector highway construction. It is approximately in the same location as a stone masonry dam built in 1823, which the concrete dam replaced.



Location map.

Historical Significance: Moses Hale constructed a dam at this location in about 1792, along with a grist mill and saw mill. Called Hale's Mills, the small village that emerged here and the families who lived in this area reflected the transition from a wholly agricultural society to a mix of farming and manufacturing. None of the buildings connected with the Hale family survive, including Hale's mansion, which was one of the finest Federal-style residences in Lowell. The dam, which Hale rebuilt in 1823, extended across the brook until 1961

when the state demolished it and constructed a reinforced-concrete gravity dam that remains in place.

Congress Street and Robinson Street Residences

This aerial view of Congress (red arrow) and Robinson (yellow arrow) streets shows the small residential enclave nestled along the brook, which was relocated here as part of the Lowell Connector construction in the early 1960s. Many of these houses were built in the 1870s and 1880s, a period of rapid residential development in Lowell.

Description: About 16 dwellings dating from the late 19th and early 20th century line Congress and Robinson streets. All of these buildings are of wood-frame construction and there are single as well as multiple-family houses. The earliest includes the Thomas Pratt house on Robinson Street, constructed ca. 1875, and the Thomas F. Pratt house on the corner of Robinson and Congress streets, constructed ca. 1880. In addition, several

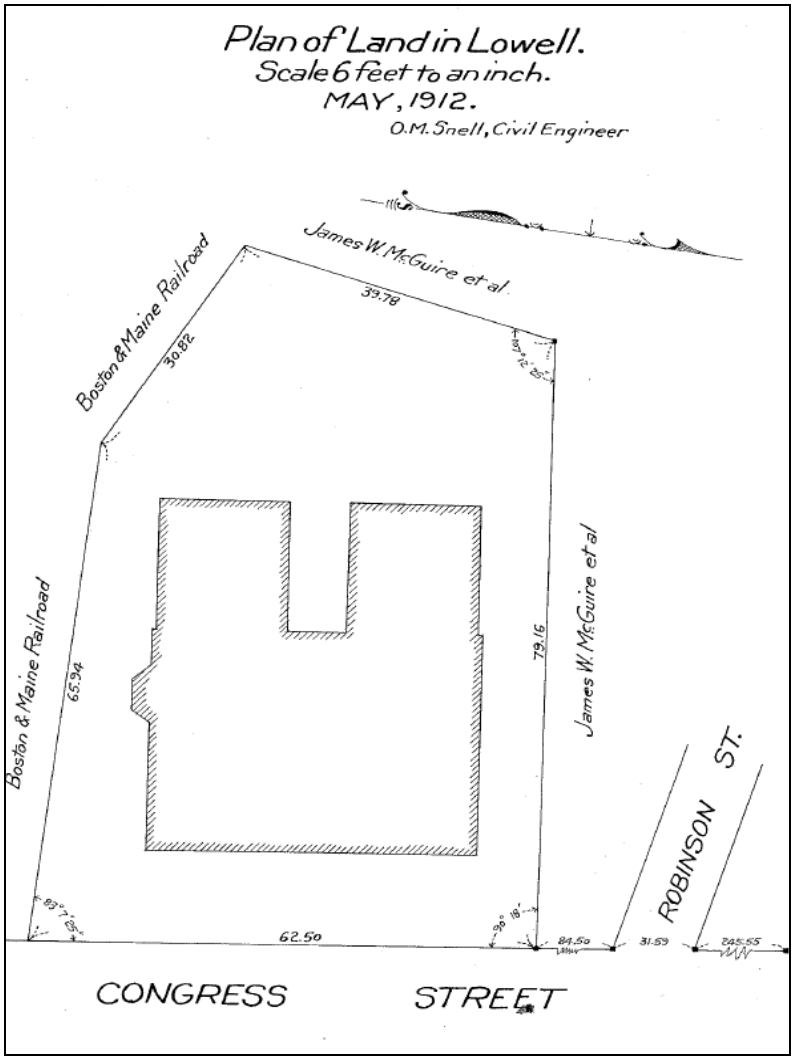
Location map.

houses on the east side of Congress Street adjacent to the dam, were built ca. 1880 by Albert G. Swan.

Historical Significance: These houses were built as early as the 1870s and as late as the early 1900s. Some were demolished in 1959-60 in conjunction with the Lowell Connector construction. The surviving dwellings are on land that was formerly part of the Moses Hale estate and later the Joshua Swan estate. This small residential area encircled by River Meadow Brook to the north and west, and light industrial works and the former Boston & Maine Railroad tracks to the west and south, reflects the urban and industrial growth of the once agrarian village at Hale's Mills.

The Thomas F. Pratt house was built c. 1880 and is one of the larger dwellings on Congress Street. His father, who resided around the corner on Robinson Street, sold him the lot on which he built this multiple-family dwelling. Pratt and his father were carpenters and stair builders.

This residential area experienced even more change in the early 1960s in the wake of the Lowell Connector construction and the relocation of River Meadow Brook. A number of houses were demolished and two bridges crossing the brook were removed, including the Congress Avenue span. Today, the residences along Congress and Robinson streets are accessible only via Congress Street off Gorham.



This plan of the Thomas F. Pratt house shows the relatively compact lot on which the multiple-family was built. (Source: Northern Middlesex Registry of Deeds, Plan #3868A.)

These three single-family houses were erected ca. 1880 along Congress Street by Albert G. Swan, son of Joshua Swan.

This multiple-family dwelling on Congress Street was built in the 1870s by George Runels, a dealer in stone and developer of property formerly associated with the Swan estate. The brook is just beyond this house.

Hale's Mills Lower Dam (Site)

A dam was located here as early as the 1740s and is most closely associated with farmer and early industrialist Moses Hale. This view is of its remains is from the Newhall Street bridge crossing the brook and looking upstream

Description: The remnants of this small masonry dam may be seen from the Newhall Street bridge crossing the brook and looking upstream to the northwest.

Historical Significance:
This dam may have been built by Joseph Moors (Sr.) or Joseph Pierce as early as the 1740s. It is listed on a deed of sale when Simeon Moors sold a parcel of land, which included the dam, as well as a saw mill and grist mill, to Moses Davis in 1779.

Location map.

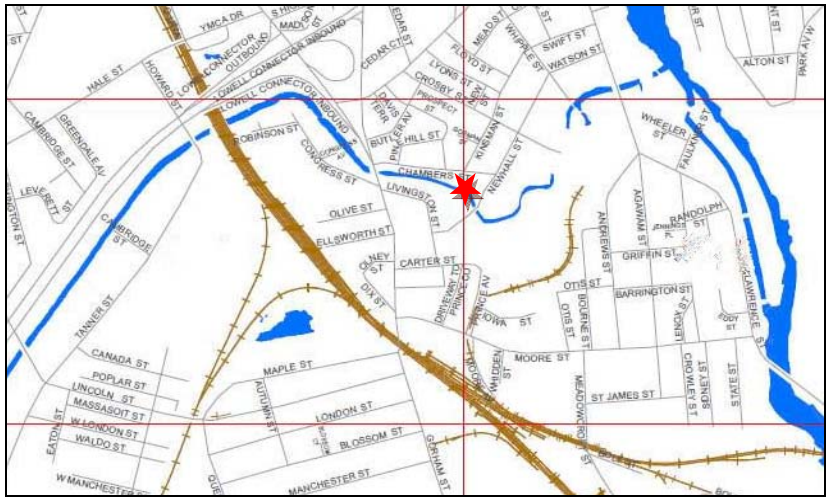
Davis' son-in-law, Moses Hale, established a fulling mill (also called a clothier mill) by 1794 and four years later he held title to the land, dam, and water rights. Hale established a gunpowder factory at this site in 1818 using the water from the mill pond behind the dam to power the machinery. One year after Hale's death in 1828, Oliver Whipple purchased the dam and associated property, including the gunpowder factory buildings. The gunpowder works was discontinued and Whipple subsequently leased the property. A number of textile-related factories were associated with the dam, including a carpet mill and a dye works. The dam appears on maps as late as 1950 and its remnants are clearly visible today. These remains are associated with the oldest dam in Lowell.

Mather's Mills (Site)

Site of the lower mill of Joshua Mather, looking west from Newhall Street.

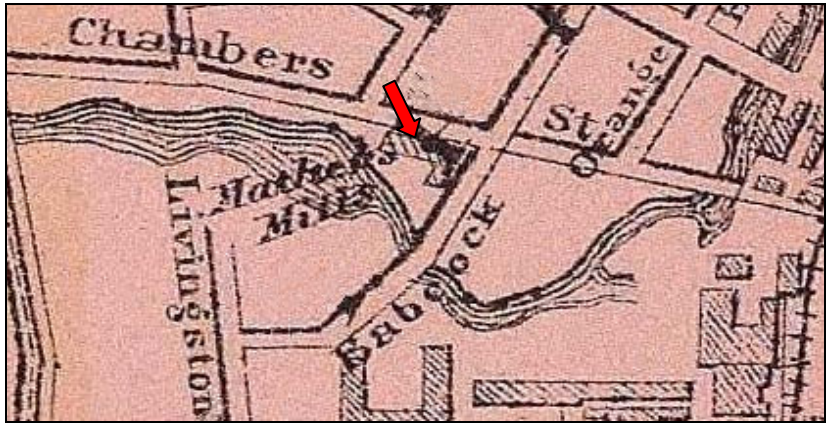
Description: The site of Mather's Mill is located along Chambers Street near the intersection with Newhall Street. Two low-slung, one-story, concrete-block buildings, which serve as garages, occupy the western extent of the site. A fenced-in grassy expanse that extends from Chambers Street to River Meadow Brook marks the site of Mather's Mill.

Historical Significance: The earliest gunpowder works in the area once stood on this site and was used in conjunction with the adjacent dam on the brook. By the 1830s a carpet mill operated by Scottish immigrant Peter Lawson was located here. Joshua Mather subsequently purchased the property, running a carpet mill and



Location map.

dye works until his death in 1865. Mather's heirs continued the factory for several more years, finally selling the mill property,



This detail from an 1871 atlas shows Mather's Mills (red arrow) at the corner of Chambers and Babcock (now Newhall) streets along the brook.

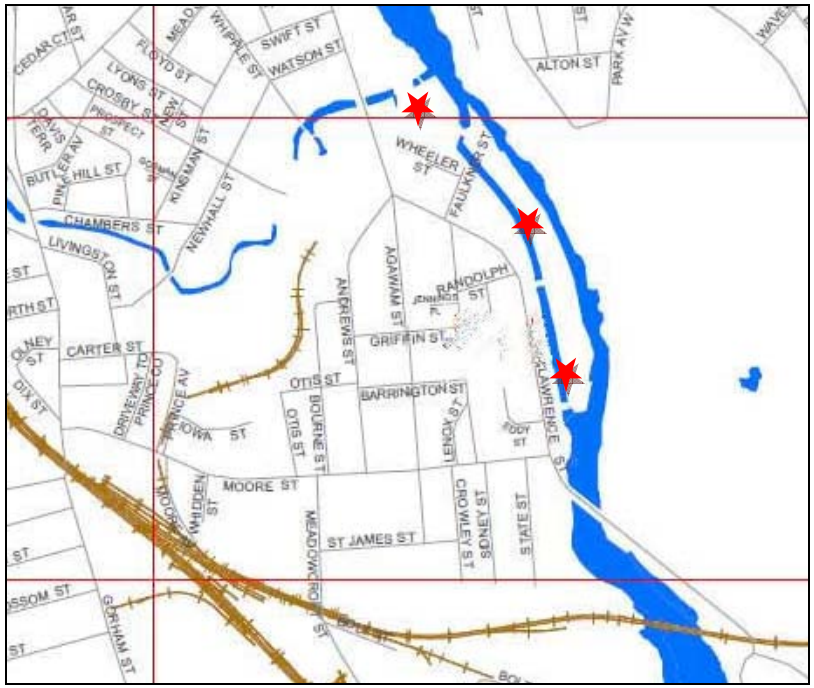
dam, and water rights to the Lowell Bleachery in 1871. The bleachery leased the mill to two different dyeing and printing firms, but a fire in 1882 severely damaged the building. It bleachery company subsequently demolished and did not redevelop the property.

Wamesit Canal and Bleachery District

Wamesit Canal

Wamesit Canal, looking south toward the gatehouse at the junction with the Concord River.

Description: The Wamesit Canal extends about 1,500 feet along the Concord River, beginning at the Wamesit Falls. It flows to a small automated hydroelectric plant, located about 200 feet from the mouth of River Meadow Brook, before



Location map.

discharging into the Concord River. Until the 1960s, the Wamesit Canal extended beneath Lawrence Street up through a series of mills along River Meadow Brook. A series of tailraces from these mills discharged Concord River water into the brook. Currently, only sections of this part of the canal survive as do remnants of the head and tail raceways. The canal prism on the east side of Lawrence Street has been filled in thus eliminating any flow of water from the Concord River to the canal along River Meadow Brook.

This view of the Wamesit Canal prism on the west side of Lawrence Street is looking east toward the Concord River. Note the stone walls of the canal and the remnants of the headgate in the foreground. These gates controlled the amount of flow into the penstock, out of the photo to the left, and into the dual turbines located below along River Meadow Brook.

Historical Significance: Originally called Whipple's Canal after gunpowder manufacturer Oliver Whipple, this waterpower canal predates the much better-known Lowell canals associated with the large cotton mills. Loammi Baldwin, Jr., a civil engineer who had been involved with his father and brothers in building the Middlesex Canal some two decades earlier, served as consulting engineer during the planning of Whipple's Canal, which was constructed in 1821-22 and was initially about 1,000 feet in length, from the Wamesit Falls on

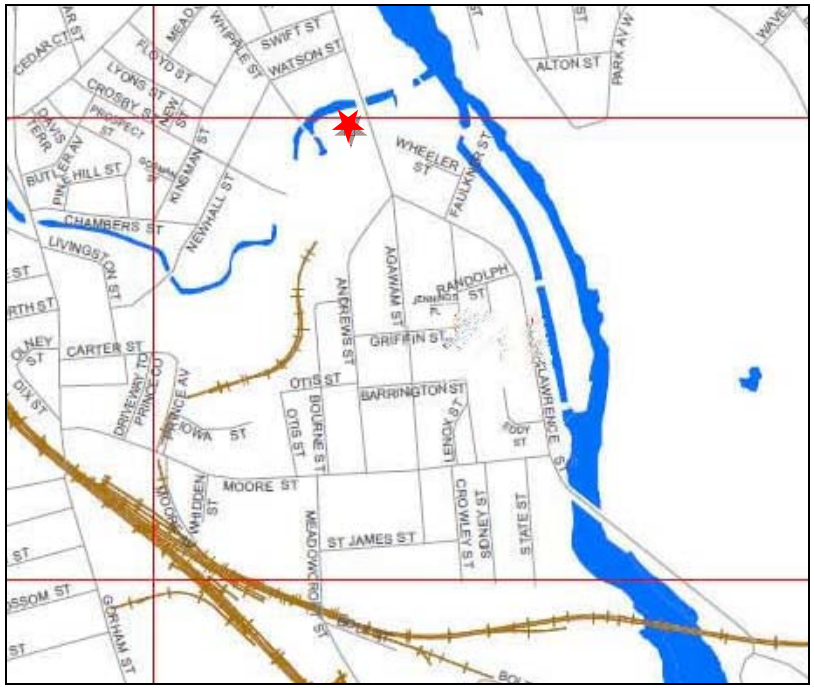
This view of the Wamesit Canal on the west side of Lawrence is looking west toward the headgates that controlled the flow of water into the dual turbines down the hill to the right. The canal prism is currently filled with trash and there are trees growing up from the canal's bottom.

the Concord River to the mouth of River Meadow Brook. A drop of nearly 25 feet was used to power the newly established gunpowder works of Whipple. Between 1856 and 1862, the canal was lengthened, deepened, and widened, extending up the brook with a flume delivering Concord River Water to the Lowell Bleachery. Benjamin F. Butler and a group of local investors acquired the Whipple industrial property and canal in 1865, forming the Wamesit Power Company. For over 100 years, this firm held water rights to the Concord River's flow in the vicinity of Wamesit Falls and between 1865 and the 1920s, Wamesit Power improved and expanded its manufacturing buildings, which it in turn leased to various industrial concerns. In addition, a number of woolen mills and dye works built factories along the canal using water provided by the Wamesit Power Company to power machinery and process textile goods. These textile companies closed beginning in the 1920s and today the canal serves only a small hydroelectric plant that was completed in 1990.

Belvidere Woolen Mill No. 2

Belvidere Woolen Mill No. 2 as viewed from Lawrence Street, looking southwest. The section of the factory in the foreground is an addition to the original mill and was built in the 1870s. It served as an office and storehouse.

Description: Belvidere Woolen Mill No.2 dates from 1862 with a number of additions in the late 19th and early 20th



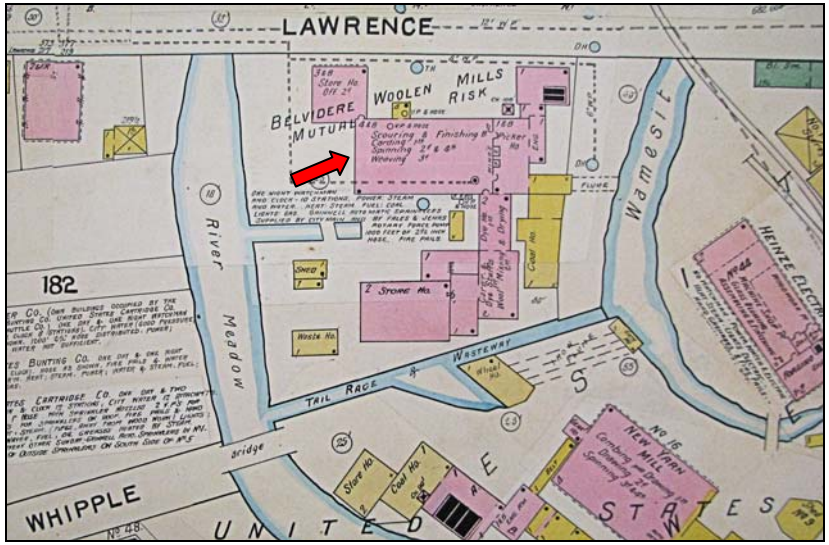
Location map.

century. The main mill building consists of a three-story brick structure with a basement and off-center stair tower. Attached to the main mill is a brick three-story, with basement, addition, constructed in the 1870s. The brick smokestack and boiler house adjoin the main mill to the south and the dye house, which emptied its effluent into River Meadow Brook, is located in the rear of the factory complex.

Historical Significance: Charles Stott's Belvidere Woolen Mill No. 2 was constructed during the Civil War, when Lowell's large cotton mills were shut down. An English immigrant, Stott operated this mill and another woolen factory

River Meadow Brook curves around the former Belvidere Woolen Mill No. 2, which is located along Lawrence Street The original factory building (red arrow) remains standing although the clerestory and trapdoor monitor roof was replaced around 1890 by a slightly pitched roof. The office and storehouse addition (yellow arrow) is to the right, and the dye house (blue arrow), behind the main mill building, is visible in the center.

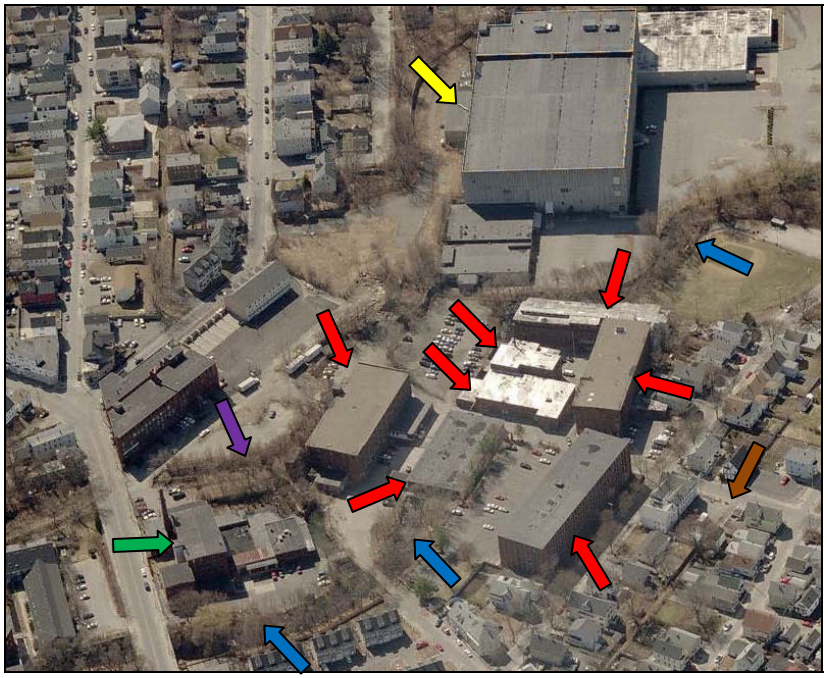
on the east side of the lower Concord River near the Middlesex dam. Mill No. 2 mill produced fancy cassimere and flannel goods. After Stott's death in 1882, his son Charles A. Stott directed the company. The younger Stott died in 1912 and the No. 2 mill was subsequently acquired by the nearby Stirling Mills. These buildings constitute one of the most intact woolen mills in the region.



This detail from an 1892 (updated to 1902) Lowell atlas contains some detailed information on Stott's Belvidere Woolen Mills No. 2. The original main mill building (red arrow) is at the center. The turbine that powered the mill using Wamesit Canal water was located in the basement of the main mill. Weaving was done on the third floor, spinning on the second and fourth floors, carding on the first floor, and scouring wool and finishing woolen goods in the basement.

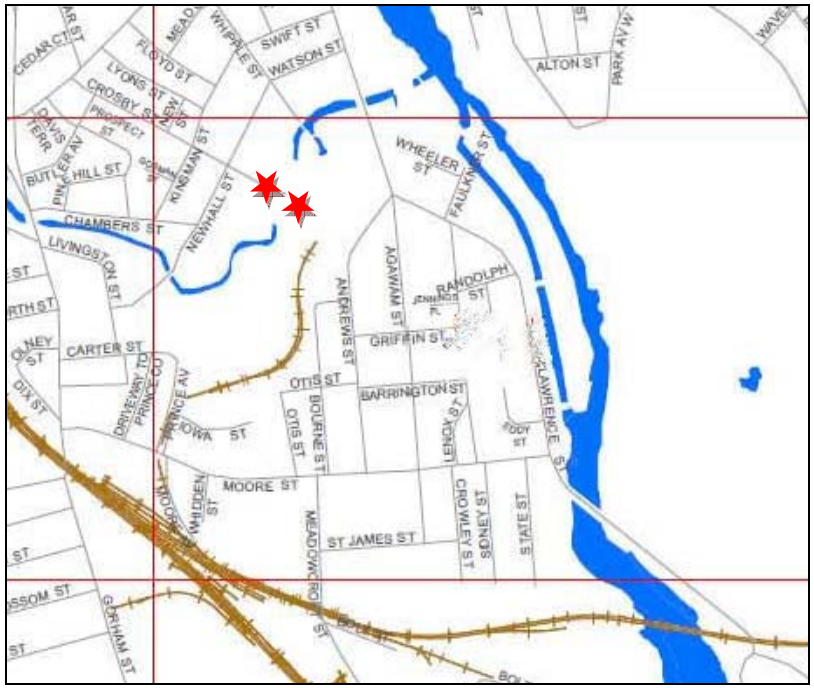
U. S. Bunting Company

Description: This group of brick factory buildings on both sides of River Meadow Brook is associated with the United States Bunting Company. The oldest buildings date from the early 1880s; the largest building, located along Newhall Street,



Seven major buildings (red arrows) formerly associated with the U.S. Bunting Company are seen in this aerial photograph. The brook (blue arrows) flows under much of the factory site. The massive concrete and steel building (yellow arrow) of the former Prince Macaroni Company is to the south of the site and the former Belvidere Woolen Mill No. 2 (green arrow) is to the east. The prism of the Wamesit Canal (purple arrow) extends along the southeast perimeter. Crosby Street (brown arrow) crosses the brook and leads into the mill complex.

was constructed in 1907 and served as a weaving mill. It is now an apartment building.

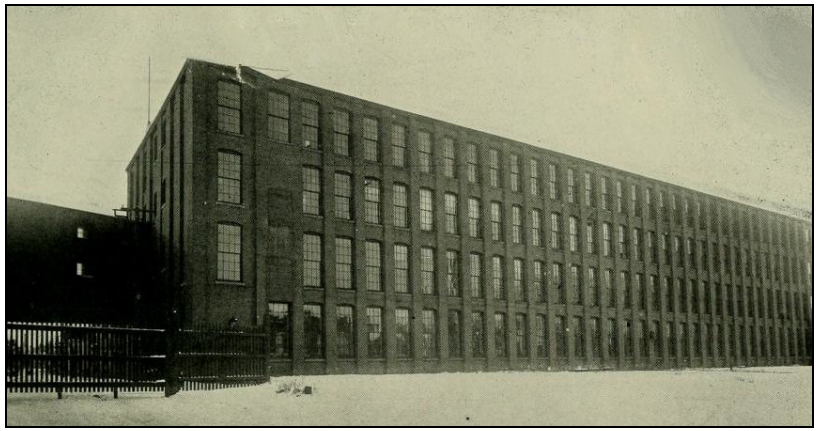


Location map.

Historical Significance: Founded in 1865 by Benjamin F. Butler, United States Bunting Company began producing flag bunting in a factory within the works of the newly established Wamesit Power Company. U. S. Bunting quickly became the most successful manufacturer of bunting cloth in the United States. Butler exploited his ties within the U.S. Congress and to military officials to garner government contracts with his company. In 1866 he introduced the company's agent, De Witt

The two-story brick building with a wood-frame top story dates from the early 1880s and is one the oldest structures associated with the U.S Bunting Company. River Meadow Brook runs along the south façade.

C. Farrington, to a group of U.S. Senators whereupon Farrington presented lawmakers with a large American flag, produced by the bunting company, to fly over the U.S. Capitol. It was reportedly the first flag of American-manufactured bunting to be hoisted over the capitol building During the 1870s the company emerged as the second largest woolen mill in Lowell and expanded its production to include worsted dress goods. By the mid 1880s U.S. Bunting employed 450 women and men, and operated with five sets of cards, 5,000 spindles, and 220 looms. Following a fire in 1907, which destroyed a dye house, warehouse, and carpenter shop, the company rebuilt and modernized its operation, constructing a large five-story building along Newhall Street, which stands today.



Led by Brooks Stevens, U.S. Bunting expanded along River Meadow Brook, on Newhall Street, in 1907 with the construction of this modern brick factory building that was used to weave bunting and worsted goods. (Source: *History of American Textiles*, (Boston: 1922), p. 367.)

After Benjamin Butler's death in 1893, Farrington brought in two brothers, Charles Brooks and George Stevens, to help

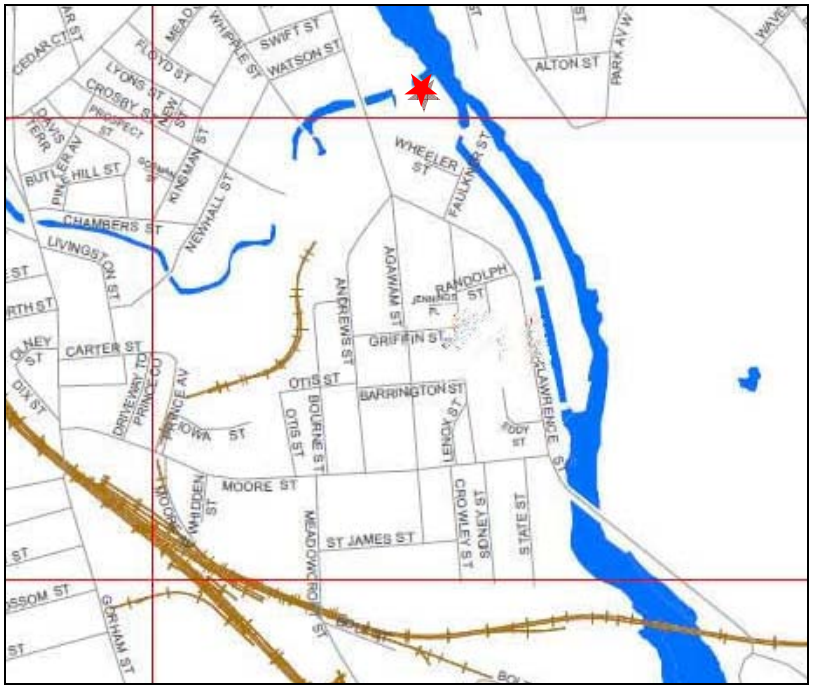
This four-story brick building was erected ca. 1890 and was originally used for weaving fancy dress worsteds. The foot of Crosby Street, where several of the former U.S. Bunting buildings still stand, is seen to the left.

manage the U.S. Bunting Company. By 1898 Brooks Stevens (as he was called) served as treasurer and guided the company over the next four decades, until his death in 1949. U.S. Bunting closed in 1950 throwing 500 men and women out of work. Ames Worsted, which the Stevens brothers founded in 1921 and operated for many years within the Wamesit Power Company's property, alongside U.S. Bunting, continued to run at the site until 1955. Its closing brought to an end 90 years of worsted production at this location.

Stirling Mills

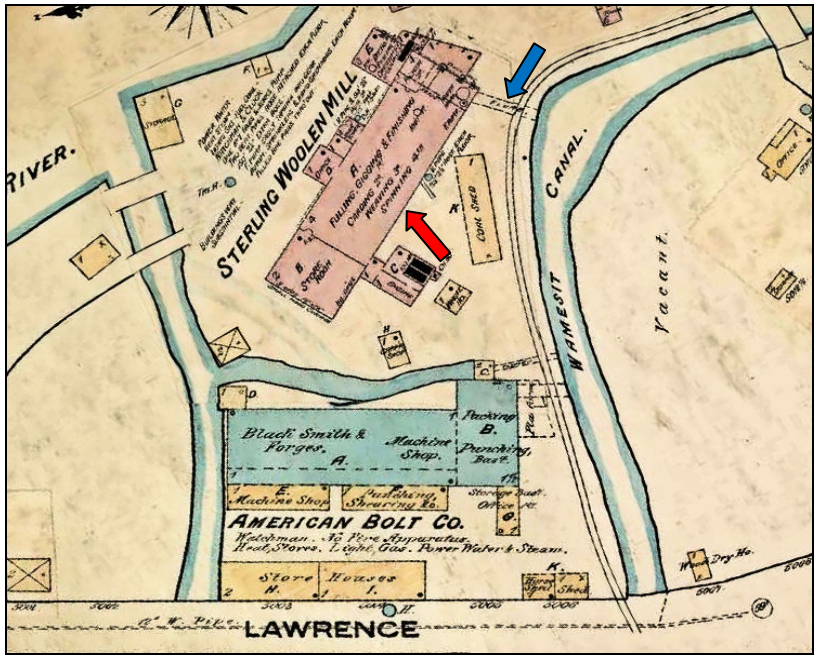
The former Stirling Mills is now a housing development for senior citizens. The factory complex includes the main mill (red arrow), the storehouse (yellow arrow), and the carbonizing building (blue arrow), which spans River Meadow Brook.

Description: The former Stirling Mills features three major buildings. The largest is the four-story main mill of brick construction with an off-center stair tower topped with its distinctive pyramidal roof. Spanning River Meadow Brook is a one-story brick structure, known as the carbonizing building in which raw wool was processed. Adjoining this building is a four-story brick structure once used as a storehouse and office.



Location map.

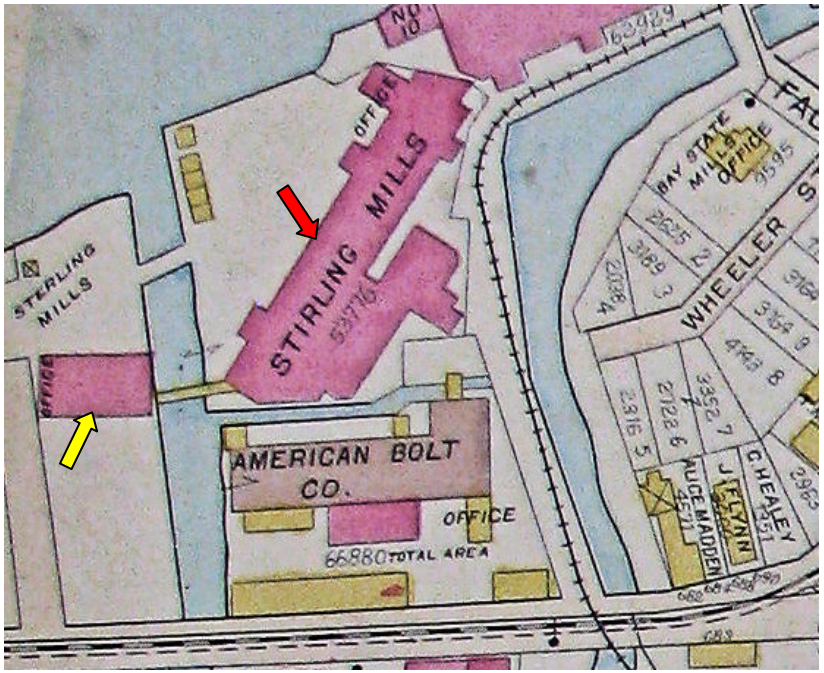
Historical Significance: During the Civil War, when Lowell's cotton mills closed as a result, in part, of the raw cotton shortage, the city's far smaller woolen industry prospered and a number of new factories on the Concord River were constructed. One of these was located near the confluence of River Meadow Brook and the Concord River. In 1864 Charles A. Stott, son of the English-born Charles Stott, who was one of the most successful woolen manufacturers on the Concord River in Lowell, received his father's financial backing and erected a four-story, brick mill that measured 111 feet by 54 feet. Water provided by the Whipple Canal, which was soon



This detail from an 1882 Lowell atlas shows the newly rebuilt four-story mill (red arrow) erected in 1880 on the site of the original 1864 mill. The entire mill complex was significantly expanded in 1896. The headrace (blue arrow) that delivered water from the Wamesit Canal into the mill's turbine is seen in the upper right (blue arrow).

renamed the Wamesit Canal, powered the mill's machinery that included six sets of cards, spinning frames, and power looms, and initially employed about 60 persons. The company produced plain and twill flannels, and ladies' dress goods.

Although Charles Stott was one of the key investors, the Boston-based firm of Parker, Wilder & Company, a successful selling house for a number of textile firms, maintained ownership of the property. As agent, Charles A. Stott managed



This detail from a 1906 Lowell atlas shows the main four-story mill (red arrow), which was enlarged in 1896, and the four-story storehouse and office (yellow arrow), erected in 1897.

the mill and it was during its initial years of operation that Stott gained a measure of support among Lowell's working men and women when he spoke in favor of the 10-hour movement. His management of the mill, however, was uneven and he relied heavily on his father for both technical and financial support. In the late 1860s prices for cotton and woolen goods dropped and the industry suffered a short-term depression. Charles A. Stott's mill never recovered from this downturn and in 1871, Parker, Wilder & Company purchased the property, which was eventually renamed the Stirling Mills.

This view of the Stirling Mill complex is taken from the north side of River Meadow Brook. The former carbonizing building, erected in 1907, spans the brook just above its confluence with the Concord River.

Soon after it assumed control of the mill, Parker, Wilder & Company appointed Edward D. Holden mill agent. Born in West Concord, New Hampshire, in 1848, Holden received his education in public schools and a private academy before working at his father's woolen mill of the Concord Manufacturing Company. He moved to Lowell in 1874 and remained as agent of the Stirling Mills until his death in 1902. It was during Holden's tenure as agent the woolen company became profitable and significantly expanded its factory. The original mill was demolished and a new four-story mill of brick construction was built in 1880. The powerhouse, containing a 96-horsepower turbine and a 200-horsepower steam engine, which substantially increased the capacity of the mill for additional machinery, was completed in 1883. The brick smokestack that stands today was rebuilt in 1890. Another major expansion occurred in 1896 when the main mill was enlarged and the following year the company built a four-story storehouse and office across the brook, connected with a wooden walkway.

The Stirling Mills was one of the earliest woolen manufacturers to use carbonizing machinery to scour raw wool. This wool scouring process entailed a series of acid baths for removing oils and cellulose fibers from the wool. The company constructed a building to house the carbonizing equipment in 1907 and this structure extended across Hale's Brook. This permitted waste water and acid to be dumped through the floor directly into the brook.

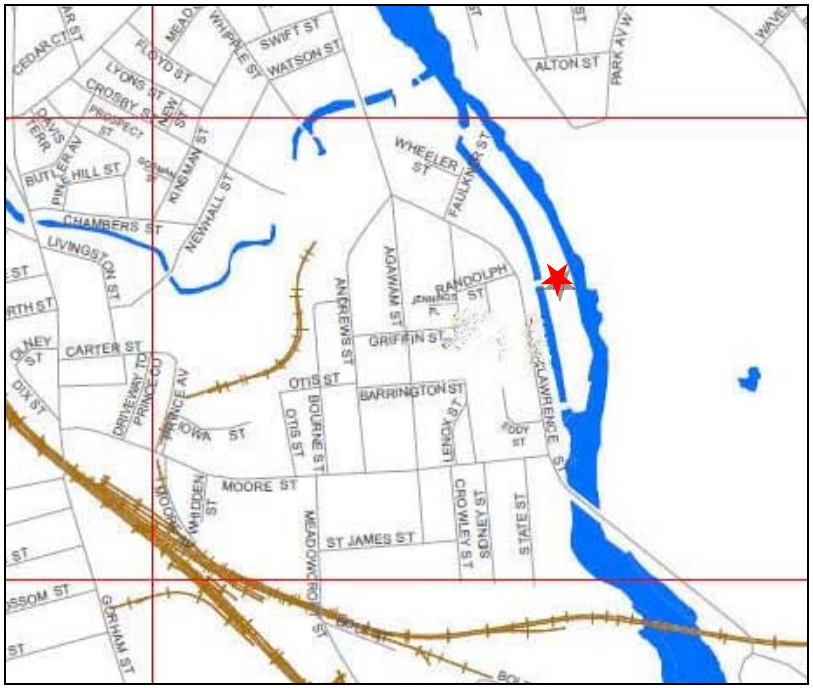
The peak years of production for the Stirling Mills occurred during World War I when the company employed about 250 workers. By the late 1920s the mill contained 14 set of cards, some 7,000 mule spindles, and 94 broadlooms. Its main products included broadcloths, flannels, and women's suitings. Although the Stirling Mills remained in operation during the early years of the Great Depression, employing as many as 235 workers, the company ceased business in the mid 1930s. For 10 years, beginning in the late 1940s, the Supreme Parlor Furniture Company occupied part of the mill until 1957. Kenneth M. Scagel subsequently purchased the property before a developer converted the factory into housing for senior citizens.

Waterhead Mills

The former Waterhead Mills (red arrow) was built in 1910 following a fire that destroyed an earlier wood frame factory located closer to the headgate house (blue arrow) of the Wamesit Canal. An addition (yellow arrow) to this three-story brick building was completed in 1915. The Wamesit Power Company owned the factory property until 1939, when the Waterhead Mills, led at this time by Clive Hockmeyer, purchased it. In recent years the old mill building has gained renown as Romalho's West End Gym.

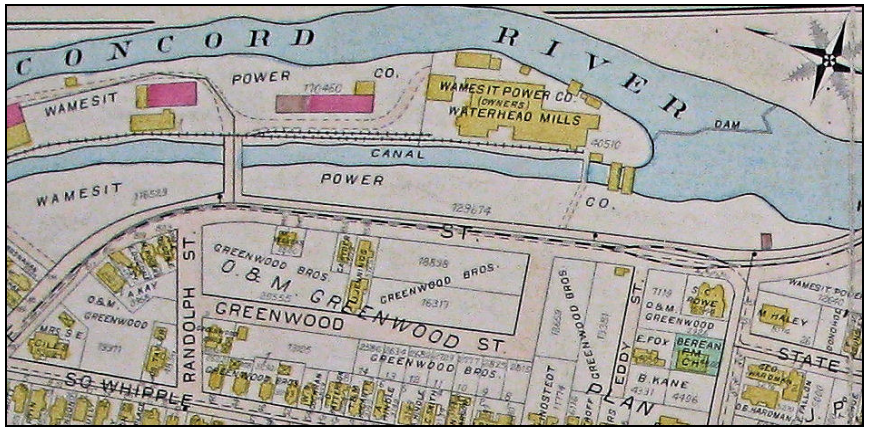
Description: This three-story, with full basement, brick building contains a three-story addition at the south end of the factory and a brick smokestack.

Historical Significance: Shortly before William and Otto Hockmeyer established the Waterhead Mills in 1900, the major industrial concerns on Centennial Island included R.W. Kendall & Company's Lladnek dye and print works, the Stirling Mills, and the Bay State Mills of the American Woolen

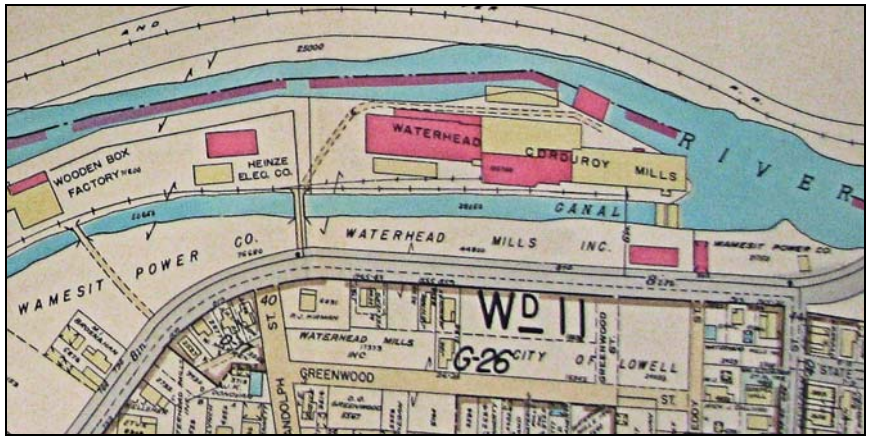


Location map.

Company, which had taken over the Faulkner Mills in 1899. The Hockmeyers, who were of German and English parentage, initiated their textile firm in the defunct Lladnek works, which closed a few years earlier. The Hockmeyers imported English machinery for the processing of corduroy and velvet. In addition, they installed dying vats and equipment for finishing cotton goods. They quickly prospered and in 1908 the Hockmeyers incorporated their firm capitalizing it at $50,000. They employed about 200 women and men with the dye house being an exclusively male workforce.



This detail of the Waterhead Mills from a 1906 Lowell atlas shows the factory location at the southern end of Centennial Island. At this time the Wamesit Power Company owned the property. The wood-frame mill complex had been previously occupied by a dye works.



By 1936, the year that the Hockmeyers purchased the property from the Wamesit Power Company, the Waterhead Mills occupied the southern end of Centennial Island.

A fire in 1910 severely damaged the wood-frame factory complex. Immediately, work began on a three-story brick building a short distance north of the charred ruins. Within six years, the company erected two additions to the new mill, the largest of which was a three-story brick structure used for dyeing and finishing. By the mid 1910s the Waterhead Mills was the nation's largest finisher of velveteens, moleskins, and corduroys.

Around 1920, Clive E. Hockmeyer, who was in his twenties and was the eldest of Otto's two sons, became treasurer of Hockmeyer Brothers, Inc. His younger brother Victor soon joined him in the family firm. They purchased the mill property from the Wamesit Power Company in 1936 and continued in operation during the Great Depression, despite the shutdown of a number of the city's textile manufacturing concerns. In 1939 Clive Hockmeyer founded another textile company, Vertipile, Inc., to engage in the manufacture of flock and loose flock goods.

For nearly two decades thereafter the Waterhead Mills and Vertipile operated nearly side by side. Vertipile rented factory space in the old American Bolt Company plant on Lawrence Street, as well as in the former U.S. Cartridge Company's factory, across the street. Eventually the Waterhead Mills closed, though Vertipile, led by Clive Hockmeyer, Jr., and his brother Vincent, continued to operate in Lowell into the early 1970s. In 1972 the company relocated to an industrial park in Leominster, Massachusetts.

After the Hockmeyers closed the Waterhead Mills the family sold the property to S. Joseph (Sy) Solomont of Universal Associates, Inc., a local real estate development company. In

This view of the west façade of the former Waterhead Mills and the brick smokestack is looking southeast from the Wamesit Canal. Much of the factory's original architectural fabric remains although the windows were substantially altered during the years that the Mel Hoffman furniture company occupied the building. Although sections of the building are in poor condition, it is the one surviving factory on the southern half of Centennial Island (the Stirling Mills is the other extant historic textile mill on the island.) Romalho's West End Gym currently occupies part of the old factory.

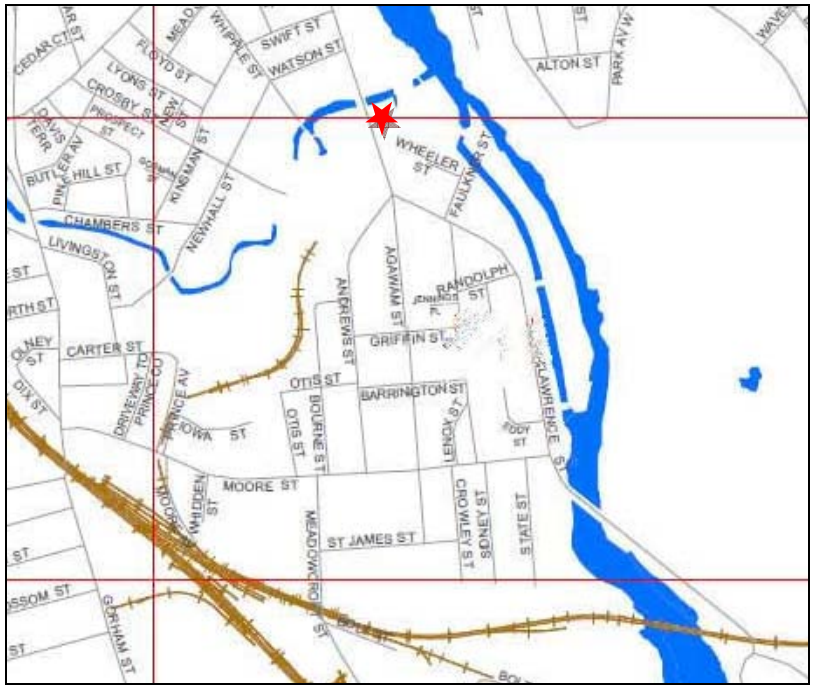
1960 Melvin J. Hoffman, an upholsterer and furniture maker in Waltham, Massachusetts, purchased the old factory building Hoffman and his sons operated the manufacturing and retail company into the early 1980s. Since 1995 the well-known Romalho's West End Gym has occupied part of the old factory.

American Bolt Company

The American Bolt Company began operating as Smith & Meadowcroft's bolt factory in part of the old Whipple Powder Works in 1847. The granite building seen here dates from 1855 when Smith and Meadowcroft purchased the property. It is now a residential building. Behind this structure a tail race (red arrow) of the Wamesit Canal.

Description: This long rectangular two-and-a-half story granite building contains a gable roof and a wood-frame addition that runs the entire length of the main façade.

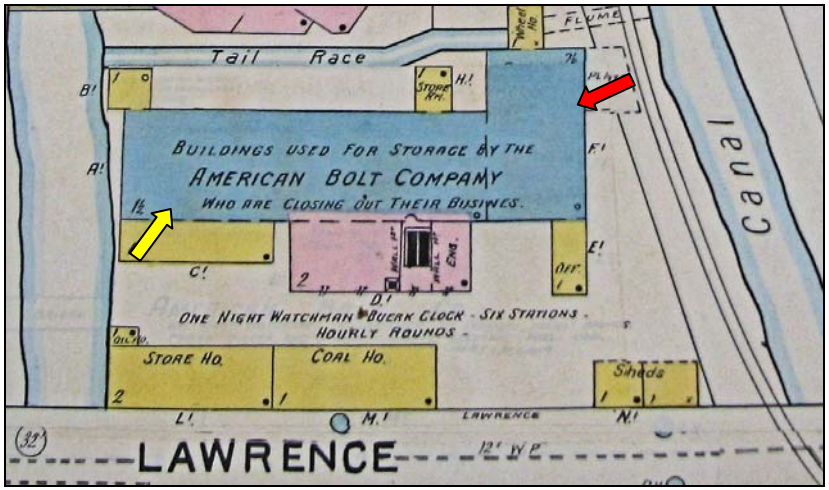
Historical Significance: In 1847 two English immigrants, James Meadowcroft, a blacksmith, and George C. Smith, a machinist, formed a partnership and began producing bolts, screws, and metal fasteners. Meadowcroft who was from Rochdale, England, settled in New York two years earlier



Location map.

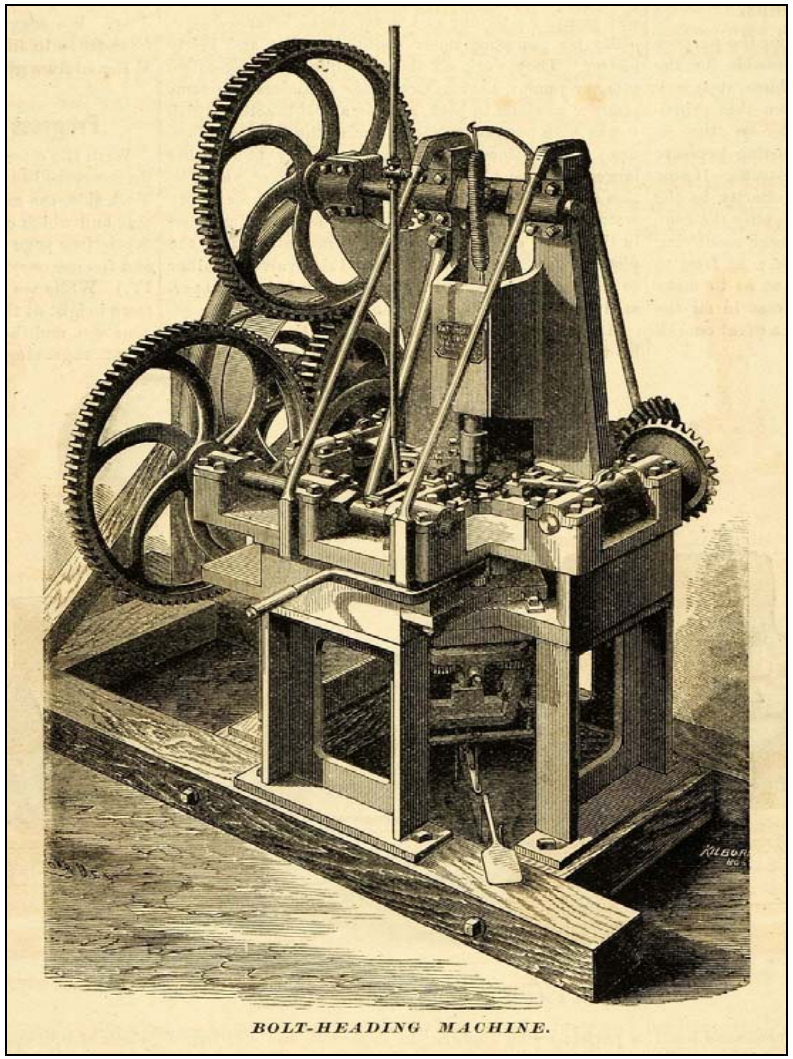
before moving to Lowell. He and Smith leased part of a factory associated with Oliver Whipple's gunpowder works along Whipple's Canal, set up several forges in the granite-walled building, and hired a number of skilled blacksmiths for manufacturing bolts and screws. Although machinery for making bolts and screws had been developed and improved in the early 1840s, production at Smith & Meadowcroft entailed a great deal of hand labor and skill using metal cutting tools and lathes.

The company generated sufficient profit and in 1855 Meadowcroft and Smith purchased the building from Oliver

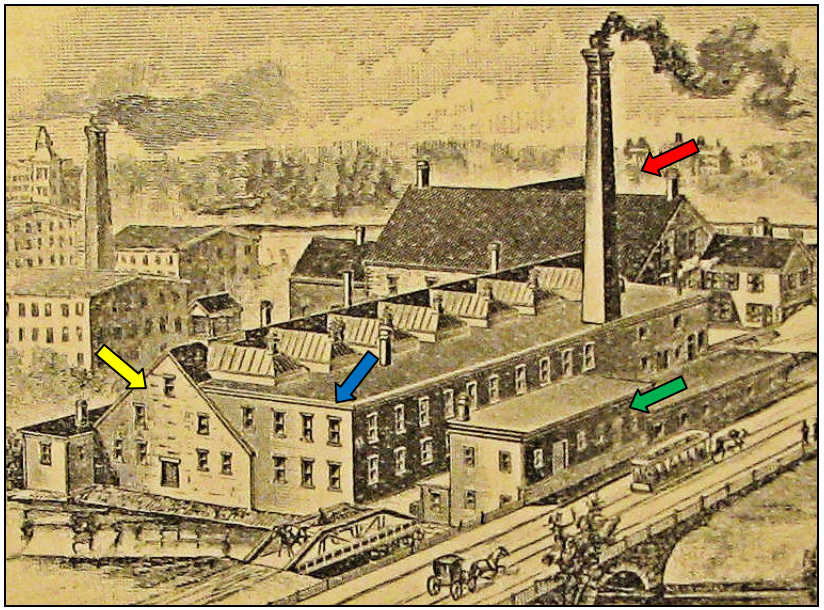


This detail from an 1892 Lowell atlas (updated to 1902) shows the American Bolt Company's factory, which was used only for storage by 1903. The original Whipple powder mill building (red arrow) dates from the early 1820s. Adjoining it is the addition (yellow arrow) built by Smith & Meadowcroft in 1855.

Whipple. They welcomed two more partners, David S. Sherman, a machinist from Canton, Massachusetts, and Jonathan Hope, another English émigré who had been working as a block printer for the Merrimack Mills, alongside a brother of George Smith. At about this time, these partners renamed the firm the American Bolt Company. In 1862 Meadowcroft retired from the business and became a "gentleman farmer" and real estate speculator, having purchased a large amount of property in the vicinity of Moore Street. The following year ill health forced George Smith to quit the firm and marked the end of the original partnership. Hope and Robert H. Butcher, a machinist and overseer of the Merrimack Mills repair shop, immediately assumed control of the company.



This engraving of James Minter's bolt-heading machine dates from 1873. The company used this machine to produce bolts and also fabricated and sold it to other bolt makers, including railroad shops.



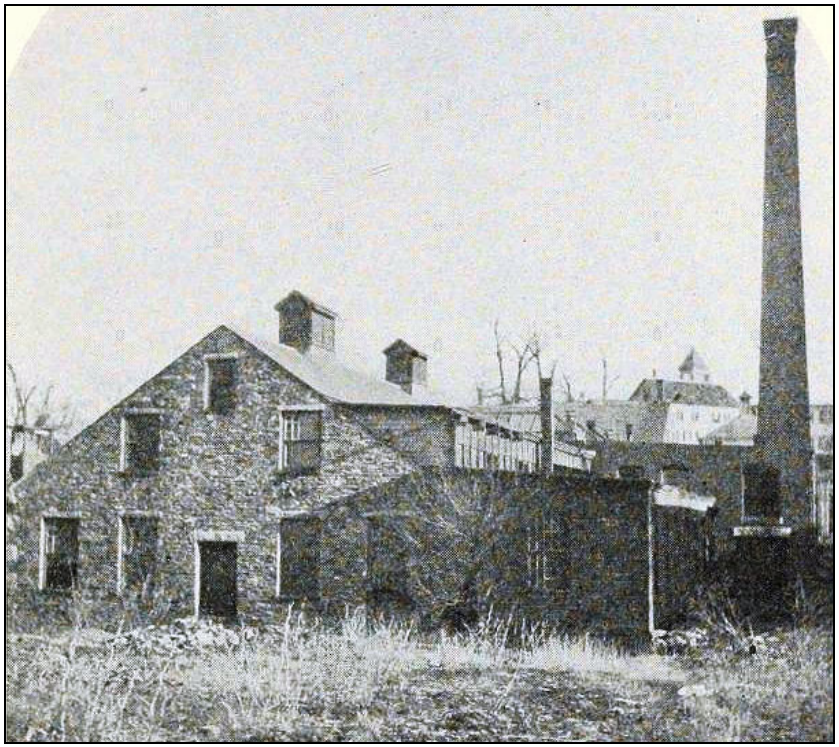
This detail from an engraving published in 1890 shows the American Bolt Company works in the early 1880s, shortly after the firm was incorporated. The original Whipple powder works building (red arrow) is to the right; the addition from 1855 (yellow arrow), which contained a gable roof and granite walls, is also visible behind an extension (blue arrow), consisting of a two-story brick structure constructed in the 1870s. The company's office (green arrow) is seen along Lawrence Street.

In 1865 Hope and Butcher brought into the company James Minter who had operated a successful blacksmith shop in Worcester. More importantly, Minter had recently patented an improved bolt-heading machine that was introduced into the Lowell factory and greatly mechanized production. By the early 1870s a worker using Minter's machine could produce five to eight bolts per minute, of three-eighths to one inch in

diameter, and from one to two-and-one-half feet in length. Over the next 10 years the company gained a national reputation and shipped its products throughout the United States and to South America. Hope, Butcher, and Minter became quite wealthy from this business. Hope departed in 1879 and two years later the American Bolt Company was incorporated under the aegis of Butcher, Minter, and Miles F. Brennan who superintended the works. The company was capitalized at $200,000 and employed 125 men.

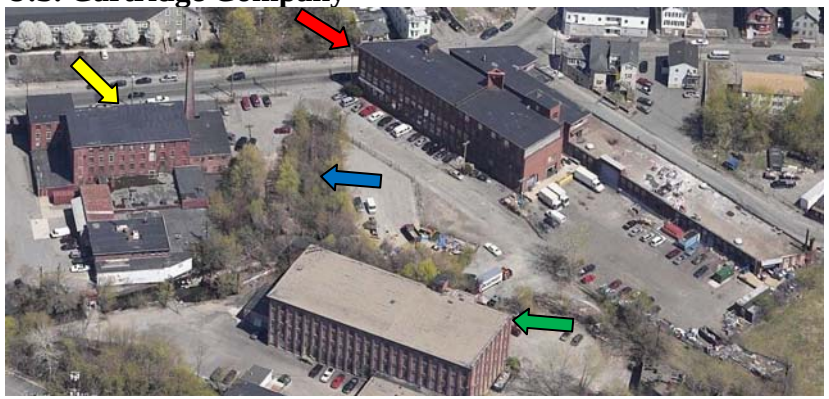
Although business in the bolt, screw, and metal fastening industry was lucrative, competition was fierce and companies like American Bolt relied heavily on large contracts. In the mid 1880s, for example, after experiencing a period of diminished profits the company received an order for over 35 tons of bolts for a railroad construction project in Cuba. In addition to bolts for railroad tracks and cars, bridges, and roof trusses, American Bolt also manufactured and sold its bolt-making machines. By the late 1880s the company had as many as 200 men working at its factory. A 75-horsepower turbine, with water from the Wamesit Canal, powered the machinery. In reserve the company also had a 150 horsepower steam engine that it used during the seasons of low-flow in the Concord River.

In the 1890s the Wamesit Power Company's treasurer, Paul Butler, son of Benjamin Butler, gained a large share in the American Bolt Company. Butler replaced Minter as president, and Percy Parker, a cousin of Butler, became the treasurer and oversaw the firm's financial affairs. It was Parker who, in 1902, led in a merger with a bolt maker in Birmingham, Alabama. The Lowell factory soon closed and Parker had the machinery shipped to the Birmingham plant. In 1909, seven years after the factory was shut down, the Wamesit Power Company purchased the granite building with the brick addition. It then leased the space to various industrial concerns, including a textile spinning company led by Mark Ingham, a former Lowell mill overseer. Eventually Ingham moved to another mill property and Vertipile, Inc., founded in 1939 by Clive E. Hockmeyer and a producer of flock, moved into to the old factory. Vertipile remained here until the late 1970s.



This photograph of the American Bolt Company's works appeared in the 1900 publication Lowell*: A City of Spindles*. The company ceased operation two years later.

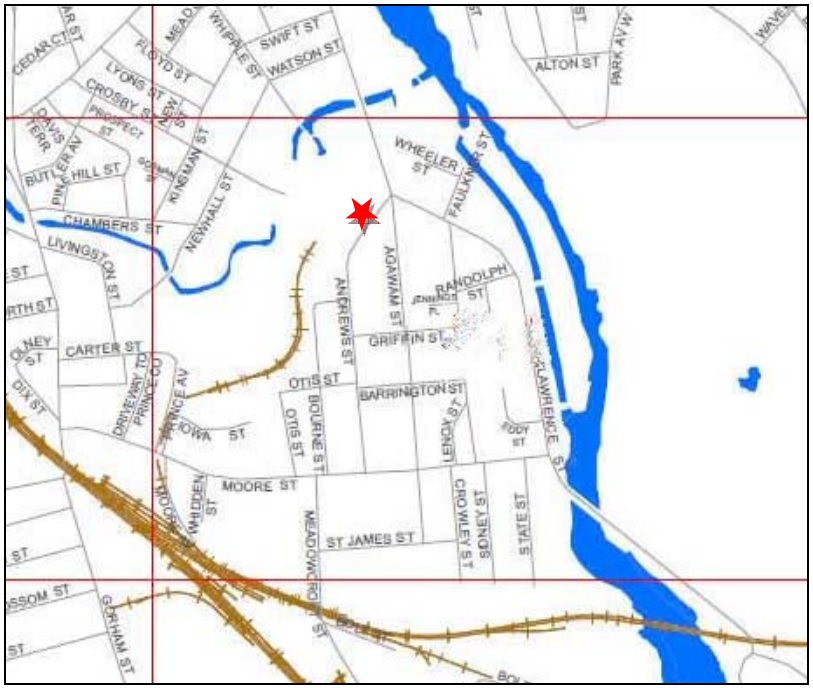
U.S. Cartridge Company



The former U.S. Cartridge Company (red arrow) is located at the corner of Lawrence and Andrews streets, south of the old Belvidere Woolen Mill No. 2 (yellow arrow). The prism of the Wamesit Canal (blue arrow) extends between these two properties. The old yarn mill (green arrow) of the U.S. Bunting Company is seen in the lower center,

Description: This four-story, with full basement, brick building contains a three-story addition at the south end of the factory and a brick smokestack.

Historical Significance: Established in 1869, the United States Cartridge Company was led by Benjamin F. Butler who, at the time, was a Republican congressman from the Fifth Congressional District (Essex County). The company was initially incorporated with a modest capitalization of $25,000. But Butler secured contracts for munitions with the federal government, which aided his fledgling firm and immediately bolstered its profits. The U.S. Cartridge Company quickly grew to rival such major ammunition manufacturers as Remington and Winchester. Local merchant De Witt C. Farrington served as treasurer of U.S. Cartridge and presided over the company's



Location map.

financial affairs. But it was agent Charles A. R. Dimon who skillfully guided the management of cartridge maker during its early years. Born in Fairfield, Connecticut, in 1841 and educated in a local academy, Dimon became a clerk in the merchant house of an uncle in Salem, Massachusetts, before enlisting in 1861 as a private in the Massachusetts Eighth Volunteer Militia, commanded by Butler. Dimon's intelligence and ambition caught Butler's attention and he was rapidly promoted to the rank of major while serving under Butler in Louisiana. After the war Butler brought Dimon to Lowell where he served as superintendent for six years and agent for

28 years. Dimon was company agent when he won the city's mayoral race in 1900. He won reelection the following year but died in office in May, 1902.

In the early 1880s U.S. Cartridge employed 250 workers who produced primarily rifle cartridges, paper-shot-shells, and primers. For several years the company engaged in the manufacture of the "Lowell Battery Gun," patented by Farrington. It was similar to the Gatling gun, but it never successfully competed against other rapid fire weapons. The factory complex expanded with the construction of additional wood–frame factory buildings adjacent to Andrews Street and the company was recapitalized in 1881 at $150,000.

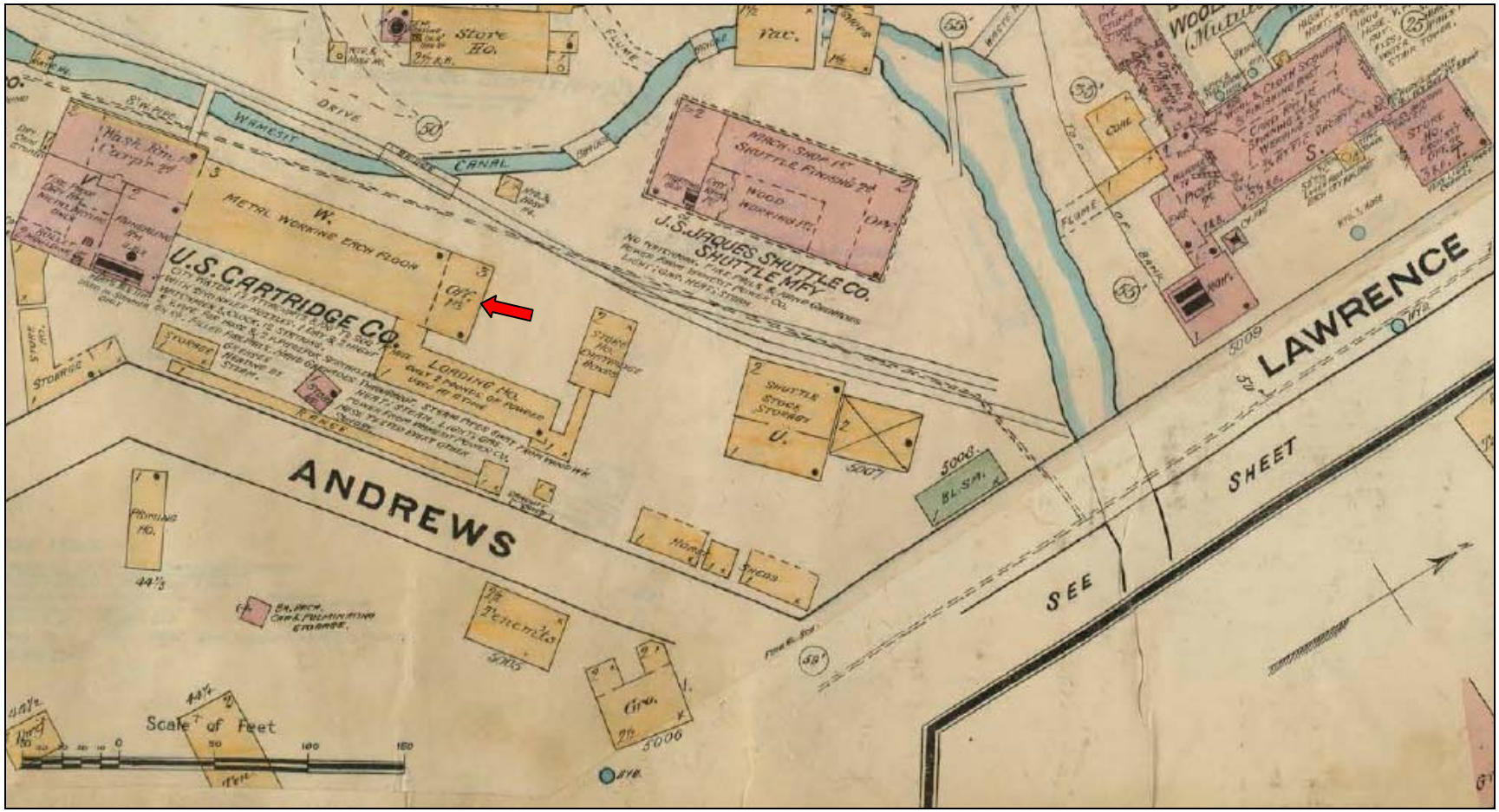
At about the same time that Dimon joined U.S. Cartridge, Benjamin Butler's son, Paul Butler, having graduated from Harvard University in 1875, began working at the cartridge factory with inventor Joe V. Meigs. Unlike his father, Paul Butler eschewed party politics and immersed himself in the mechanical arts and inventive endeavors at the cartridge company. He succeeded Farrington as treasurer and after Benjamin Butler's death in 1893.

As in other 19th century manufacturing establishments, worker injuries in the factory of U.S. Cartridge occurred all too frequently. Workers at the cartridge company faced not only the common perils of injury from machinery and the belt-driven power system on the shop floor, but also from the dangerous nature of producing ammunition. The most horrific of these dangers struck in late July, 1903, when an explosion, sparked by the ignition of gunpowder in one of the company's powder magazines that was located just over the Lowell city limits in Tewksbury, killed 22 employees and nearby residents,

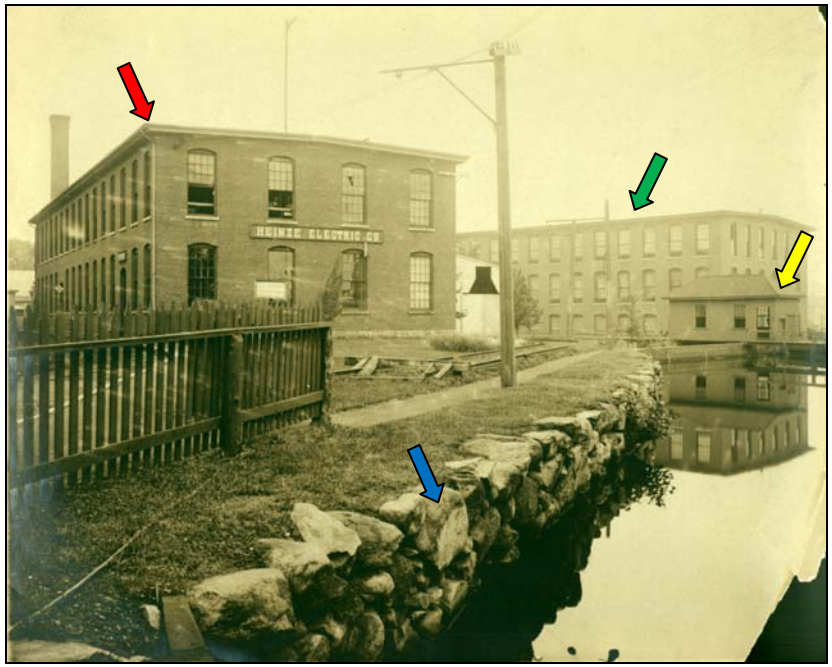
This photograph, taken in 1882, shows the original factory of the U.S. Cartridge Company, a three-story, wood-frame building. The image appeared in a 1916 edition of *Factory Notes*, which was a company-published magazine for the employees.

while injuring more than 70. The massive blast destroyed or severely damaged about 70 houses in Tewksbury's Wigginville neighborhood and the shock was felt as far away as Haverhill.

After Dimon's death in 1902, Butler Ames, a nephew of Paul Butler and son of Adelbert and Blanche Butler Ames, Benjamin Butler's sister, became agent. Like other members of his family Butler Ames attended Phillips Exeter Academy, graduating in 1889, but then went to West Point. A member of the class of 1893, Ames served only briefly in the army, but volunteered upon the outbreak of the Spanish-American War



This detail from an 1882 Lowell atlas shows the original three-story, wood-frame factory of the U.S. Cartridge Company. The sign "United States Cartridge Co" was the featured element on the north façade (red arrow) of this original building.



In this view of the Wamesit Canal (blue arrow) west of Lawrence Street the two-story factory of the Heinze Electric Company (red arrow), located next to the U.S. Cartridge Company's factory (out of the photo to the left), is seen, along with the headgate house (yellow arrow) that controlled the flow into the Wamesit Power Company's dual turbines below. Also visible is the yarn mill of the U.S. Bunting Company (green arrow). This photograph, from the collection of the Lowell Historical Society, dates from ca. 1905.

and attained the rank of lieutenant-colonel while commanding troops in Puerto Rico. Similar to his uncle Paul Butler, Ames was mechanically inventive and in 1900 he joined with John O. Heinze to form the Heinze Electric Company, manufacturers of electrical equipment, including coils for wireless telegraphy and, by 1905, electrical coils and magnetos for automobiles.

After 1902, Ames divided his time between Heinze Electric, which had its factory close to the cartridge company's plant off Andrews Street, and U.S Cartridge. Paul Butler continued to serve as treasurer and eventually Ames Butler became the company's president. The two presided over a period of expansion in the 1910s, during which time U.S. Cartridge constructed a group of brick factor buildings extending along Lawrence Street and the Wamesit Canal. By 1917, U.S. Cartridge was inundated with orders for munitions from the United States military and its allies in World War I. With over 8,000 workers, nearly half of whom were female, the company became the largest employer in Lowell. It expansion included a plant in Billerica and manufacturing space in the former Bigelow Carpet Company's factory on Market Street, as well as the works at the Wamesit Canal and in Tewksbury.

While the Butler and Ames families controlled the cartridge company through most of the 1910s, the National Lead Company acquired half of all shares of U.S. Cartridge stock. After Paul Butler's death in 1918, the Butler family sold its remaining interest in the company to National Lead. By 1922 the New-York-City-based National Lead Company, which also controlled the Winchester Repeating Arms Company, sought to transfer the operations of U.S. Cartridge to the Winchester plant in New Haven, Connecticut. Despite attempts by local politicians, members of Lowell's business community, and the city's Central Labor Council to maintain production in the Spindle City plant, U.S. Cartridge curtailed its manufacturing

Although a number of the former U.S. Cartridge Company buildings were demolished or destroyed by fire in the years after the factory closed on January 1, 1927, these substantial three-story and four-story brick structures dating from 1916-17 still stand at the corner of Lawrence and Andrews streets.

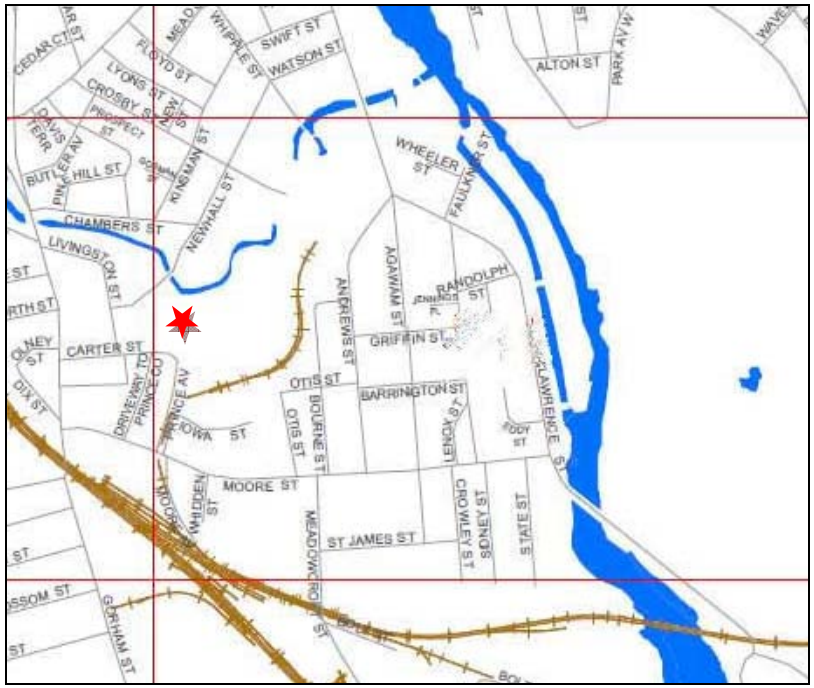
and laid off employees. Congresswoman Edith Nourse Rogers appealed to the various parties and conferred with the U.S. Justice Department to keep the plant open, but by late 1926 much of cartridge manufacturing machinery was moved to New Haven. One final effort to retain the production of radiators—this product line had only recently been established the Lowell cartridge plant—also failed and U.S. Cartridge closed down on January 1, 1927. Only about 80 of the 800 remaining employees moved to New Haven. The majority stayed in Lowell, seeking work in the economically depressed city.

After the departure of U.S. Cartridge, the Wamesit Power Company sought to lease space in the empty buildings. The largest tenant for a number of years was the Middlesex Paper Tube Company. In 1943 Butler Ames purchased the Wamesit company's property and factory buildings along Lawrence and Andrews streets. Nearly three-quarters of the space, amounting to 154,000 square feet, was rented to various companies.

Lowell Bleachery

This view of the former Prince Pasta plant shows the western façade of the concrete and steel building erected in 1978.

Description: None of the industrial buildings remains from the Lowell Bleachery, which was originally situated on this compact 20-acre parcel of land along River Meadow Brook. The major building now standing here is the former Prince Pasta factory, a large concrete and steel structure, which closed



Location map.

This view down Prince Avenue, looking northwest, shows one of the former wood-frame boardinghouses of the Lowell Bleachery Company. These boardinghouses were built in the late 1840s and are today multi-family residences.

in 1997. While all of the bleachery buildings were demolished, several wood-frame, multi-family houses on Prince Avenue (once named Bleachery Street) are extant and were originally built as boardinghouses for bleachery workers. These buildings date from the 1840s and have been modified over the years.

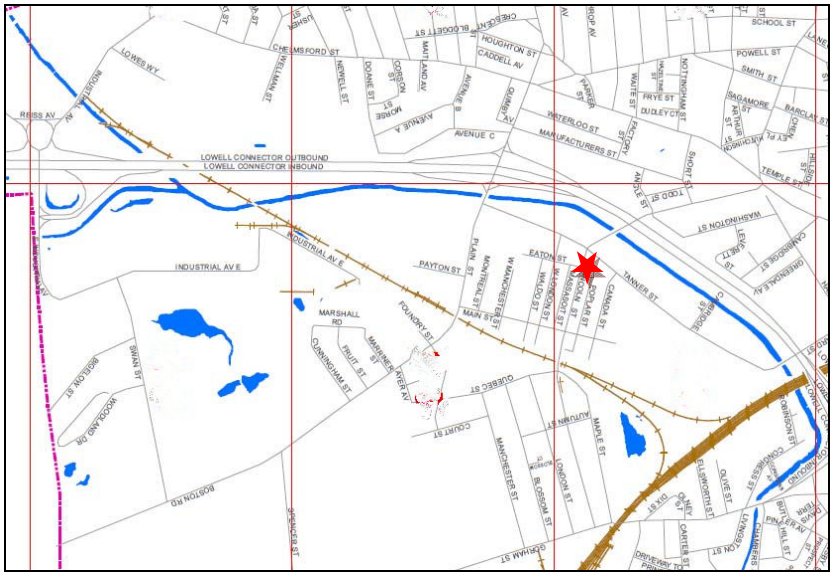
Historical Significance: Established in 1832, the Lowell Bleachery operated for about 100 years and employed as many as 400 men and women. Although the bleachery was the smallest of the major textile companies in Lowell, it was the only one in the area, as well as one of the most profitable of the Boston-based cotton corporations. By the late 19th century, the bleachery processed not only cloth from mills in Lowell and New England, but also from southern mills. Initially the factory drew water from springs in the area of Whipple's Grove and from River Meadow Brook, but by the late 1850s Concord River water was diverted to the bleachery via the Wamesit Canal. After the bleachery closed in 1930 most of the buildings were demolished. The Prince Macaroni Company, which moved to the site in 1939, occupied the vacant dye plant, a three-story brick building located along the renamed Prince Street. Prince used this building for pasta production until 1977 when the company had structure demolished and replaced with the large concrete and steel building that stands today.

Ayer's City and City Farm District

Ayer's Tannery

This aerial view shows the site of the original Ayer Tannery building (red arrow) and the property is currently occupied by David Ducharme's Auto Sales. On the north side of Tanner Street, opposite the auto sales lot is Prelco, Inc., a sheet metal fabricator. Ayer's tannery burned in 1864 and a larger brick factory was constructed on this site. It remained standing until 1969 when it was destroyed by fire. A second early tannery, consisting of a wood-frame building, was constructed in 1857 on the site of the Prelco property. This factory was also destroyed in the fire in 1864. The third tannery in Ayer's City, also originally of wood frame construction and operated by Hubbard & Blake, occupied another corner of Tanner and Lincoln streets. On this site is the former Coburn Shuttle Company's factory occupied most recently by Brady Business Forms.

Description: The site of the original three-story brick factory associated with the Ayer Tannery is a paved asphalt lot on the south side of Tanner Street between Canada and Lincoln. It is currently a used auto sales lot. Immediately across the street was the site of a second tannery building, a wood-frame structure that was destroyed in the same fire in 1864 that burned down the Ayer Tannery. Various industrial buildings have occupied this site over the years and currently a sheet metal fabricator is located here. A third tannery, on the northwest corner of Tanner and Lincoln streets, a wood-frame factory originally operated by Hubbard & Blake and completed in the early 1860s, was torn down in 1882 prior to the construction of the Coburn Shuttle Company's building.

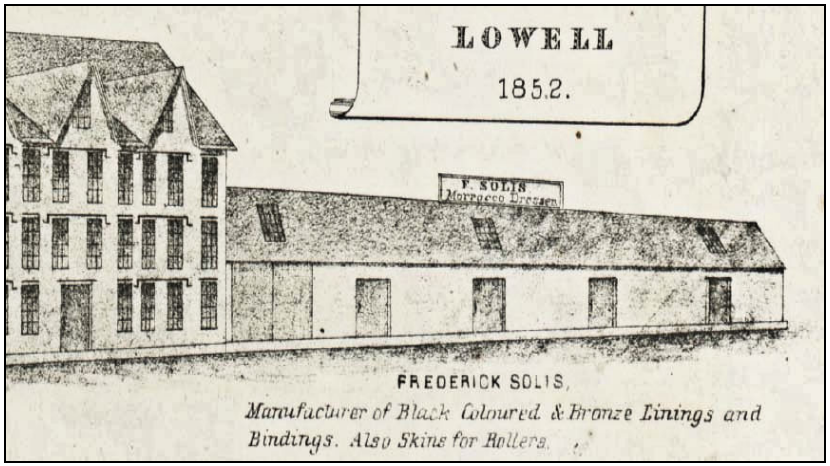


Location map.

Historical Significance: Daniel Ayer, the real estate speculator and investor who developed the eponymous section of Lowell in the early 1850s, established the first large-scale tannery in the Spindle City. Ayer's tannery stood on Tanner Street, between Lincoln and Canada streets, and was an imposing three-story wood-frame structure with a large boiler and chimney. Ayer leased part of this building to the Boston-based tannery of Williams & Bacon, and rented out another section of the factory to Samuel W. Pingree, from Lawrence, Massachusetts. In an adjoining one-story building Frederick Solis leased where he engaged in the Morocco leather business. Production was underway by 1852 and over the next several years a number of different firms operated in this building.

Two additional tanneries were constructed on opposite corners of Tanner and Lincoln streets. This included the Barnard, Bacon & Cutler tannery, completed in 1857, and the Hubbard & Blake tannery, which began operating in the early 1860s. The leather goods manufactured at these tanneries were largely for the apparel industry and not for factory belting in textile or other mills. All of these factories were steam powered and drew boiler water from River Meadow Brook

Over the years the tanneries in Ayer's City changed hands numerous times. The original tannery building of Daniel Ayer burned in a fire in 1868, was rebuilt, but was destroyed again by fire in 1874. Soon after, a new tannery building, a substantial two-story brick structure, was constructed at the same site. For nearly 15 years the firm of Arey & Maddock operated this tannery until the company closed it in 1892. For nearly 30 years various industrial concerns were tenants in the building. In the 1920s Leonard D. Hambleton initiated the L. D. Hambleton Machine Tool Company and withstood a serious fire in 1957. But in 1969 a blaze that began on the second floor quickly spread throughout the entire factory. When the fire was finally extinguished only parts of the brick walls survived and the remnants of the historic tannery were demolished. Soon after this demolition the property was occupied by a used car dealer. It presently serves as a used car lot.

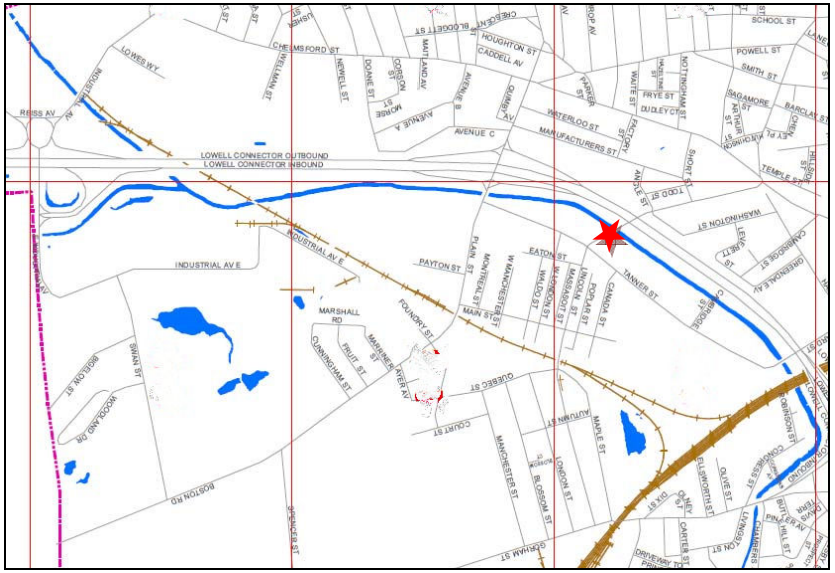


This detail from a drawing of Ayer's tannery from 1852 shows the one-story building that was attached to the larger three-story factory. For a few years Frederick Solis and his small group of workers produced Morocco leather goods here. The fate of this one-story wood-frame building is not known, but the three-story structure was destroyed by a fire in 1864.

Coburn's Shuttle Factory

This view looking southwest shows the Lincoln Street façade of the former Coburn Shuttle factory. It was later home to the Lowell Insulated Wire Company and more recently Brady Business Forms, Inc.

Description: This brick building contains a main four story section, with a projecting brick tower (its main entrance) on Lincoln Street, along with a number of two-story wings and a tall brick smokestack.



Location map.

Historical Significance: Two local businessmen, Earl A. Thissell and Edwin Lamson acquired the Coburn Shuttle Company in 1870. They continued to produce shuttles for the textile industry at a factory on the north side of the Merrimack River in the Centralville section of Lowell. After acquiring land in Ayer's City, Lamson and Thissell oversaw the construction of a four-story brick factory building at the corner of Lincoln and Tanner streets. When completed in 1882 their factory was the most modern and substantial industrial building

in this locale. In addition to the shuttle company, other manufacturers leased space from the two partners. This included the Sawyer Carriage Company, which operated in an adjacent wood-frame factory, the Pickering Knitting Company, and the Haworth & Watson Paper Tube Company. A fire in 1888 seriously damaged the brick factory, but Thissell and Lamson had it repaired and it quickly reopened.

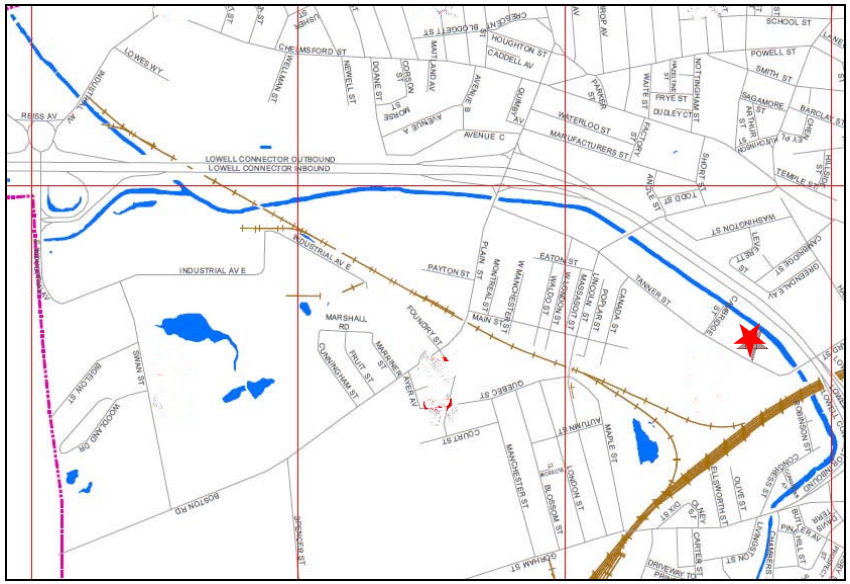
In 1891 Lamson and Thissell sold their shuttle company to the newly formed American Bobbin, Spool & Shuttle Company. This well-capitalized concern acquired a number of New England shuttle makers and aimed to dominate the shuttle and bobbin manufacturing market. Although it successfully fought an anti-trust action by the federal government, American Bobbin experienced financial difficulties and the company shut down several of its plants, including the Ayer's City factory. Thissell and Lamson resumed shuttle manufacturing under Coburn Shuttle on Tanner Street until 1903 when the company went out of business.

Soon thereafter the Lowell Insulated Wire Company, led by Englishman, Rueben Dunsford, moved into the factory. For over 50 years Lowell Insulated Wire produced electrical cords and cables at this factory. Shortly after the Dunsford family severed its connection with the firm and it was taken over by a holding company, Lowell Insulated Wire went out of business. A local company, Brady Business Forms, operated in the factory for about 40 years until it moved to Tyngsboro. The building retains some of its 1880s appearance, but has been little altered since the additions of Lowell Insulated Wire in the 1910s and 1920s.

Cheney's Box Factory

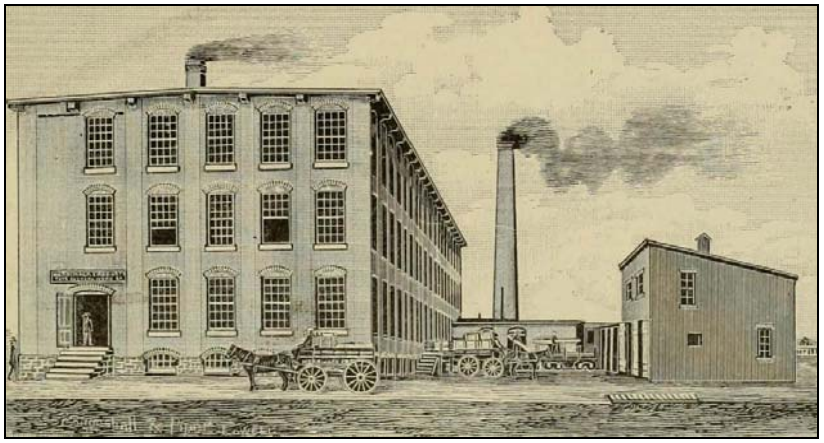
The former Cheney box factory is now part of the Scannell Boiler Works. Despite being surrounded by an adjoining building and steel crane way, the three-story brick factory retains much of its late-19th century appearance.

Description: This three-story brick building with a full basement measures 50 feet by 150 feet and is located along St. Hyacinth and Tanner streets. Originally the entrance (the west façade) fronted Tanner Street. The Scannell Boiler Works which now owns the building has constructed an adjoining one-story building along the Tanner Street façade along with a crane way extending from the building's south façade. The one story boiler house remains standing, although there is no roof and only the brick walls are extant. Next to the ruins of the boiler house is the original brick smokestack.



Location map.

Historical Significance: This three-story factory was constructed in 1887 on St. Hyacinth and Tanner streets for the Merrimack Croquet Company. The croquet manufacturing concern, originally named the National Croquet Company, was established in the early 1870s and operated in a factory on Western Avenue. Benjamin F. Colby assumed control of the firm in the mid 1880s. An 1873 graduate of Lowell High School, Colby worked as clerk and then superintendent for this company, which changed hands a number of times before he took it over. (For several years it was called the Lowell Wood Turning Company.) After the new Ayer's City factory was in operation Samuel P. Griffin joined Colby as a partner. For a few years the company was high profitable. About 75 workmen were employed at the factory and, in addition to croquet sets,



This engraving by Lowell's Coggeshall & Piper appeared in the publication Inland Massachusetts Illustrated (1891). Note the brick smokestack to the right, which stands today alongside the factory building.

they turned out piano stools, baseball bats, Indian clubs, bowling pins, and castor wheels. In one of the company's largest orders, it shipped three rail cars full of croquet sets to California in 1888.

Despite its initial success in Ayer's City the company struggled following the Panic of 1893 and by 1896 Colby was insolvent. Frank P. Cheney, who was also a Lowell High School graduate and received a degree from the Massachusetts Institute of Technology in 1888, purchased the factory property and established a box manufacturing company. Cheney's firm produced a variety of wooden crates and boxes, used primarily for shipping manufactured goods. Cheney operated his factory until 1920, when he leased it to the National Mill Supply Company, a producer of napper clothing. Cheney sold the property in 1939 after which the building was occupied by

several light industrial concerns. It is currently owned by the Scannell Boiler Works.

Gulf Refining Company's Warehouse and Garage

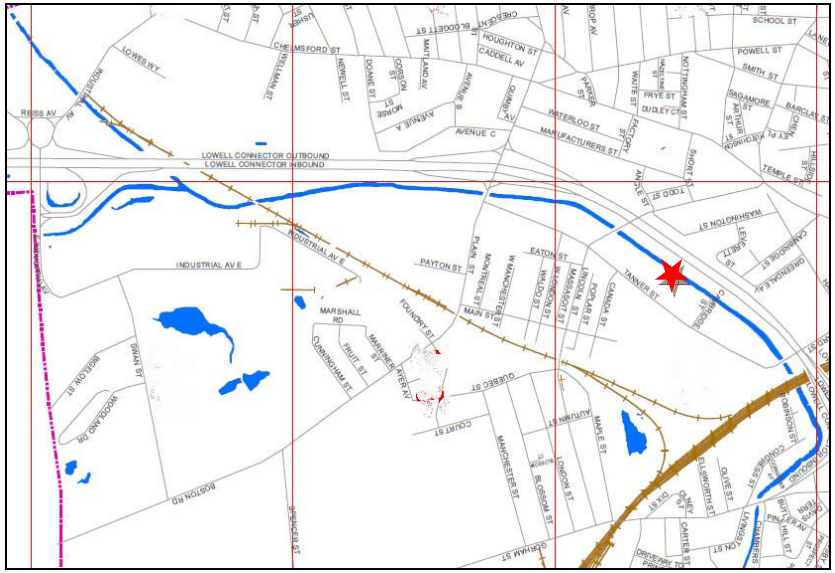
There are two extant buildings that were originally part of the Gulf Refining Company's storage and shipping facility on Tanner Street. The one story brick building, pictured above, served as the office and warehouse of Gulf Refining and is currently a bottle and can recycling center.

Description: The three buildings that remain from the Gulf Refining Company's warehouse and shipping facility are the warehouse and office, and the garages. Each building is a one-story brick structure with concrete floors and flat roofs. A brick

The garage of the former Gulf Refining Company's facility on Tanner Street initially contained three bays, but two additions, one by Gulf and the other more recently carried out, have nearly doubled the size of the earliest of original building.

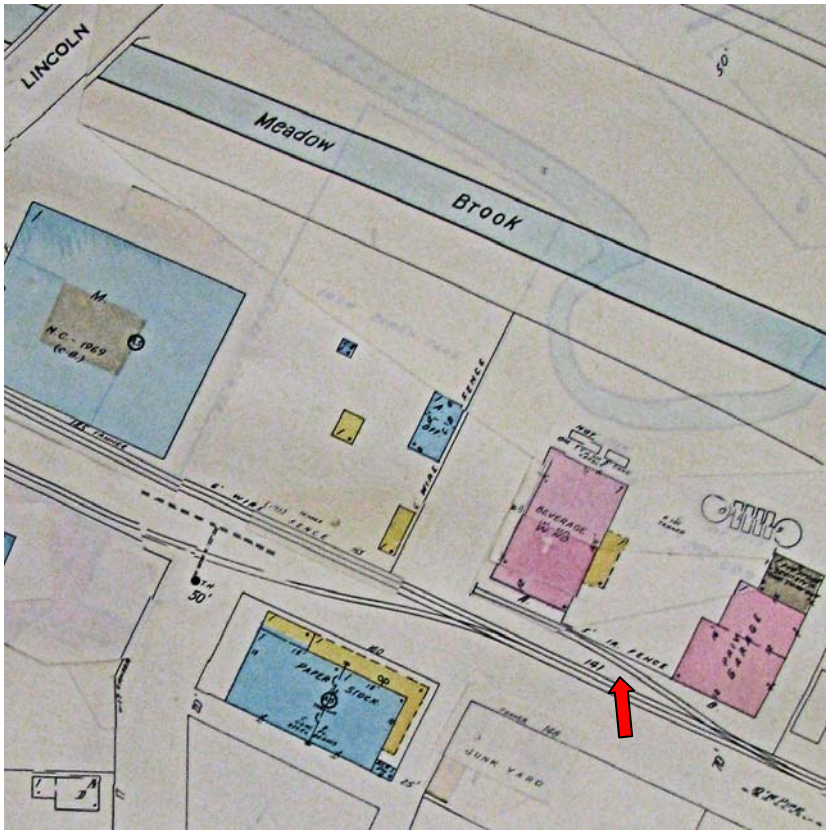
parapet wall extends along the Tanner Street (main) façade of the former warehouse and office building. The garage buildings include the original garage, located the closest to Tanner Street. It contained three bays, but one bay has since been modified and part of it now contains an office. Attached to the original garage is a three-bay addition, also of brick construction with brick parapet encircling the roof. Attached to this addition is a 1960s garage, a smaller, one-story concrete-block building, also with three bays. The steel storage tanks that once stood between the garage buildings and warehouse, a short distance from River Meadow Brook, were removed ca. 1960. A bottle and can recycling business currently operates out of the old warehouse and office. And a used car dealer and auto repair shop is located in the garage buildings. Until

recently, junked autos lined the area along the brook, but some of these rusting vehicles have been removed.



Location map.

Historical Significance: Around 1910 the Gulf Refining Company purchased property along Tanner Street and River Meadow Brook, and constructed a brick office and warehouse, along with steel storage tanks for storing and distributing petroleum products. Gulf was the second major in oil company to establish a storage facility in Ayer's City, the first being the Standard Oil Company, which, in 1895, built a warehouse and tanks on Main Street, along the Old Colony Railroad. The Gulf Refinery property was home to a warehouse structure of the Haworth & Watson Paper Tube Company, prior to 1910. When completed the site included the warehouse, measuring 60 feet



This detail from a 1955 Lowell atlas (updated to 1977) shows the former storage facility (red arrow) of the Gulf Refinery Company. Note that the relocated River Meadow Brook flowed by the buildings at distance slightly farther away than the original course of the brook.

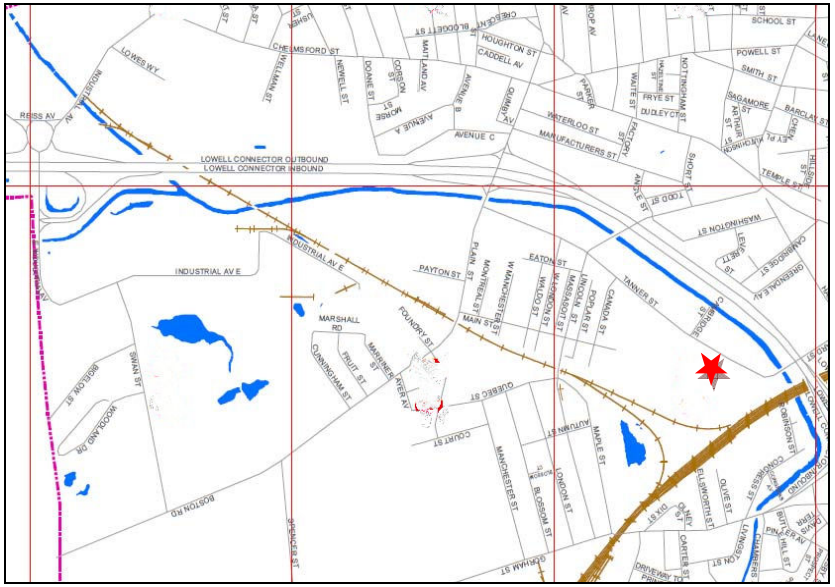
by 40 feet, a stable (later converted into a garage), measuring 32 feet by 20 feet, and a brick structure containing three steel storage tanks. In addition, a small carriage house was built next to the stable.

Gulf remained at this location into the 1950s. Over the years the company experienced a number of break-ins (money was stolen from its safe in the warehouse office on at least three occasions, a small chimney fire, and a substantial flood in 1934. After its departure the warehouse and office was used by a beverage distributor and today houses a bottling recycling company. The garage has been altered over the years with two additions and is currently home to a used car dealer and auto junk yard,

Scannell Boiler Works

This view looking northeast along Tanner Street shows the west and south façade of the main steel fabricating building of the Scannell Boiler Works. The tall stack beyond is part of the 1990s cogeneration powerhouse that is next to Scannell Boiler.

Description: The Scannell Boiler Works site contains several structures, the largest being the steel fabrication building that stands on the location of part of the original boiler works factory. This is a long, rectangular steel-frame building with corrugated metal siding. Attached to the fabrication building are a number of one-story additions, including an office and entrance to the plant on the Tanner Street side. The steel fabrication building appears to date from the 1960s and is the third main boiler works building on the site. The Scannell Boiler Works extends south to St. Hyacinth Street and includes the old Cheney box factory and an attached crane way.



Location map.

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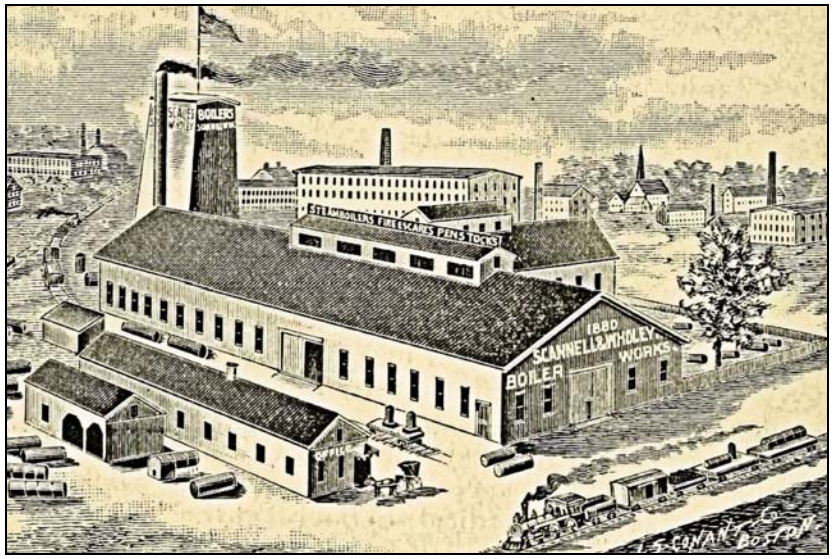
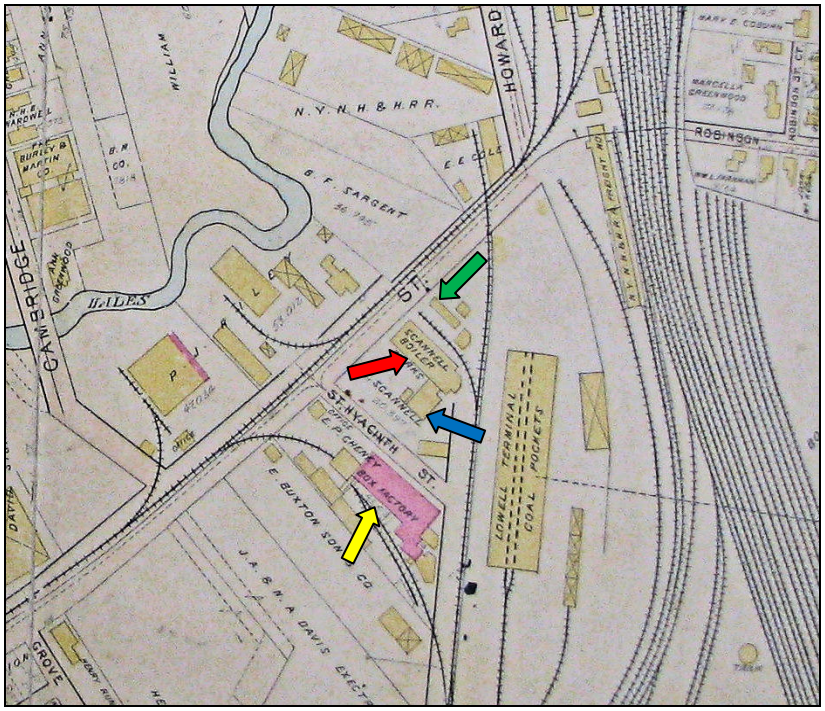


This detail from an engraving from the 1895 publication, The Industrial Advantages of Lowell, shows the main fabricating building of the Scannell & Wholey boiler works. Note that the gable end of this building, on which was painted the company's name, is on the Tanner Street side of the works (where the railroad locomotive is chugging toward Lowell's downtown).



This detail from a 1906 atlas of Lowell shows the layout of the Scannell Boiler Works, which includes the main fabricating plant (red arrow) and addition (blue arrow), along with the office (green arrow). None of these buildings still stand. But the Cheney box factory (yellow arrow), which is part of the current Scannell Boiler Works property, has survived.

Historical Significance: In 1882 Denis Wholey and Bartholomew Scannell began operating a boiler works and metal fabricating plant on Tanner Street in Ayer's City. Of Irish parentage Scannell and Wholey employed between 50 and 75 men, many of whom were also of Irish descent. Although there were a handful of strikes over the years, the company gained a good reputation among its workmen and the boiler works was one of the first industrial firms in Lowell to establish an eight-hour working day. This occurred on the heels of a strike in 1903. Cornelius Scannell, Bartholomew's younger brother, served as the long-time foreman at the boiler works. Workmen produced steam boilers, steel penstocks, fire escapes, and many other iron and steel goods. The company shipped its products throughout the United States, although

most of its business was in the Northeast. Scannell & Wholey also received numerous contracts from the city of Lowell for boilers in various municipal buildings, including the city's new high school.

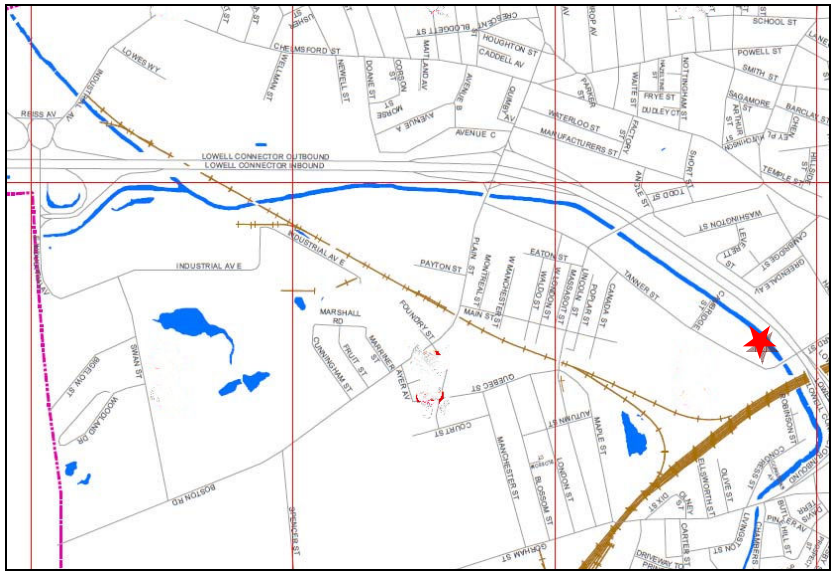
As the business prospered the Scannell and Wholey families became wealthy members of a burgeoning Irish-American middle class. Bartholomew Scannell and his family lived for a number of years on Manchester Street in Ayer's City, but in 1893 they moved to the wealthier Highlands neighborhood. Denis Wholey lived with his family on Christian Hill until moving to the Highland's area in the mid 1880s. In 1900, Scannell and Wholey dissolved their partnership. Denis Wholey departed for Providence, Rhode Island, where he established his own boiler works, and Scannell assumed control of the Ayer's City works.

After Bartholomew Scannell's death in 1920, four of his sons conducted the business with Bartholomew, Jr., as president, and Phillip as company treasurer. In the mid 1930s, the Scannell brothers formed the Lowell Iron & Steel Company, which operated alongside the boiler works and handled all steel fabrication work. Gradually the second generation of the Scannell family retired (Bartholomew ended his involvement with the two companies in 1959) and yielded the business to their sons. The Scannell family continues to operate a boiler works and steel fabricating concern at this location. The Scannells are quite likely the longest active family proprietors of an industry in Lowell.

Lowell Shuttle Company Factory

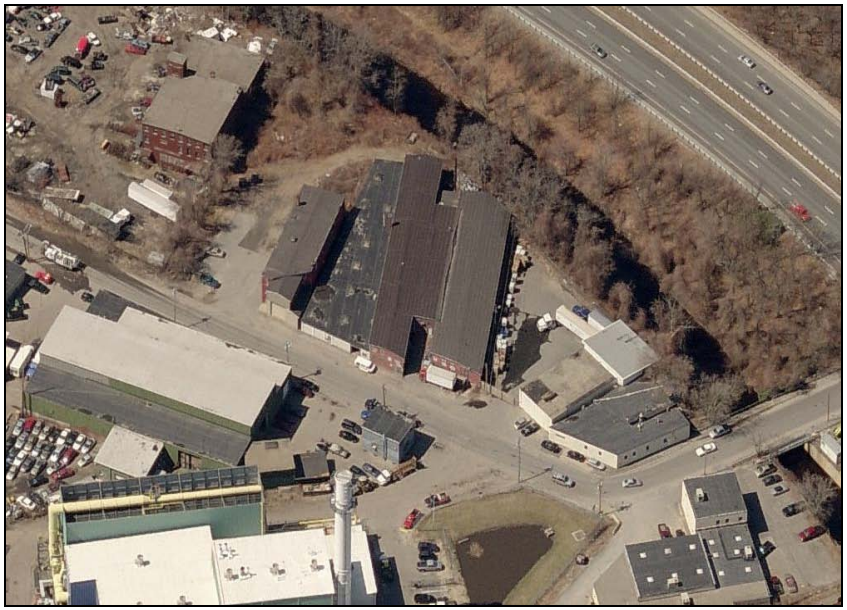
This view looking southwest shows the Tanner Street façades of the former Lowell Shuttle Company factory buildings. The oldest structures appear to date from the 1910s and are painted red. In recent years the Union Sheet Metal Company has operated here.

Description: This series of one- and two-story wood-frame buildings on Tanner Street are associated with the Lowell Shuttle Company. The earliest appears to date from the mid-1910s with additions carried out in the 1920s and 1950s. All phases of production of shuttles and bobbins were carried out in these buildings: from carpentry and metal fittings, to varnishing, kiln-drying, and polishing shuttles and bobbins, and warehousing both raw materials, including woods such as maple, birch, and beech, as well as finished products. After the Lowell Shuttle Company closed in the late 1960s the Union Sheet Metal Company occupied the site.



Location map.

Historical Significance: Arthur W. Saunders and Charles O'Neil founded the Lowell Shuttle Company in 1896 and initially operated out of leased factory space on Western Avenue. In 1900 they moved to Ayer's City and rented the top floor of Frank P. Cheney's box factory on Tanner and St. Hyacinth streets. At the time there were four shuttle and bobbin makers in Lowell. But by 1920, Lowell Shuttle was the only shuttle manufacturer in the Spindle City. Saunders purchased land on Tanner Street, across from the Scannell Boiler Works and in 1912 the company relocated there having constructed a two-story wood frame factory building. Two years later O'Neil and Saunders incorporated their firm, with the former as company president and the latter as treasurer.



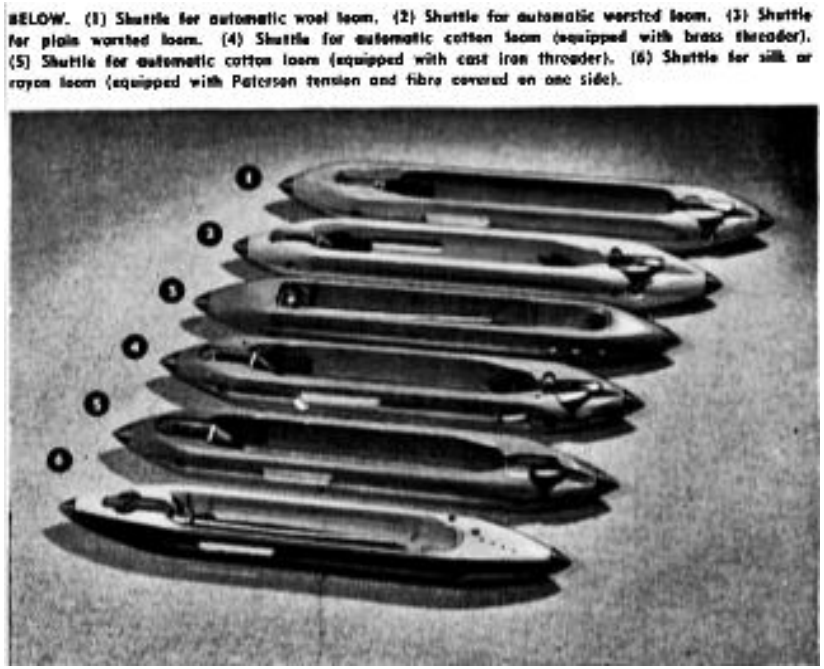
The buildings of the former Lowell Shuttle Company are located along Tanner Street near the intersection with Howard Street. River Meadow Brook runs behind the four main buildings associated with the shuttle maker, which shut down in around 1968.

The manufacture of shuttles involved several laborious steps that required highly skilled workmen in the wood-working and metal trades. In addition, the finishing of the products involved varnishing and polishing. Workers at Lowell Shuttle not only produced new shuttles and bobbins, but also refurbished used ones. While the textile mills in Lowell and New England were important customers for Lowell Shuttle, the growing textile industry in the South became increasingly important. In fact, in the late 1920s the company opened a sales office in Greenville, South Carolina, hiring an agent there to market and sell the

This view of the former Lowell Shuttle Company is from Tanner Street looking northwest. The wood-frame building painted red adjoins a corrugated-metal sided building and these were likely constructed in the 1950s. These buildings have been owned and occupied by Walbert Plastics, Inc., since the early 1970s

firm's products. By this time Saunders had quit the partnership and Lowell Shuttle was owned and operated by Charles O'Neil and his three sons.

Despite the struggles of New England's textile industry during the Great Depression, the Lowell Shuttle Company remained profitable, thanks in large measure to the Southern trade. In the 1930s the CIO-affiliated Textile Workers Union of America (TWUA) attempted to organize mills in the North and South, but was met with fierce resistance. Lowell proved no exception as the surviving cotton manufacturing concerns thwarted unionization and refused to engage in collective bargaining with union officials. The one TWUA success in 1930s Lowell, however, occurred at the Lowell Shuttle Company. After a



This advertisement for the company's various shuttles dates from the 1940s. These products included (from top to bottom) shuttle for automatic wool looms; shuttle for automatic worsted looms; shuttle for plain worsted looms; shuttle for automatic cotton looms; shuttle for automatic cotton loom with a cast-iron threader; and shuttle for silk or rayon looms.

short strike for union recognition in 1937 O'Neil and Saunders signed a contract with a TWUA local, marking the emergence of the first CIO-affiliated textile union in the city. In all, about 100 Lowell Shuttle Company workers joined the union.

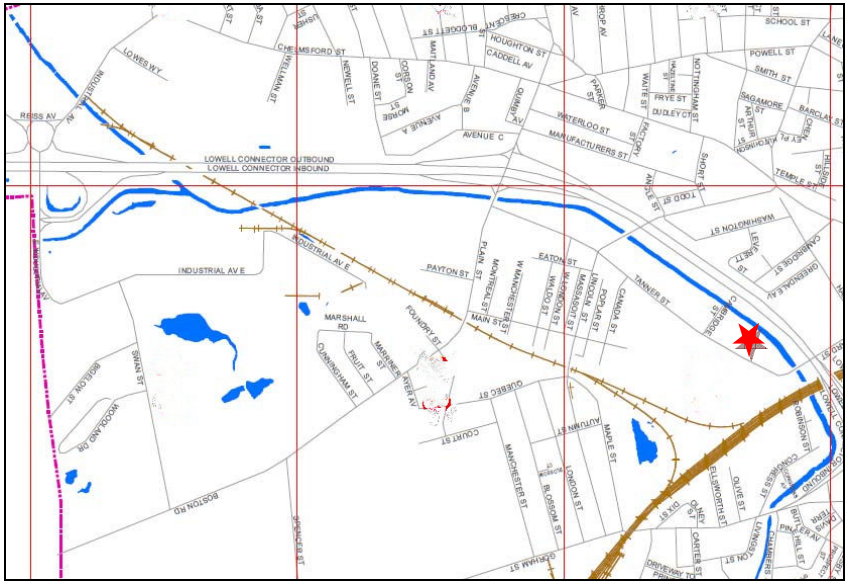
The textile industry in both the North and South boomed during the Second World War and the Lowell Shuttle Company experienced considerable growth. During the 1950s,

however, many mills closed in New England and the company's goods were sold largely in the South. The advent of shuttleless-weaving technology in the 1950s led to a major shift in the production of cotton, woolen, and synthetic-fiber cloth goods. Demand in the United States for the increasingly obsolete wooden shuttles dropped in the 1960s. The two surviving sons of Charles O'Neil, who died in 1944, were Charles F., and Peter J., and they owned the company until they ended the business in the late 1960s. In more recent years the Union Sheet Metal Company has operated here.

Patrick J. Riley's Paper Waste Company Storehouse

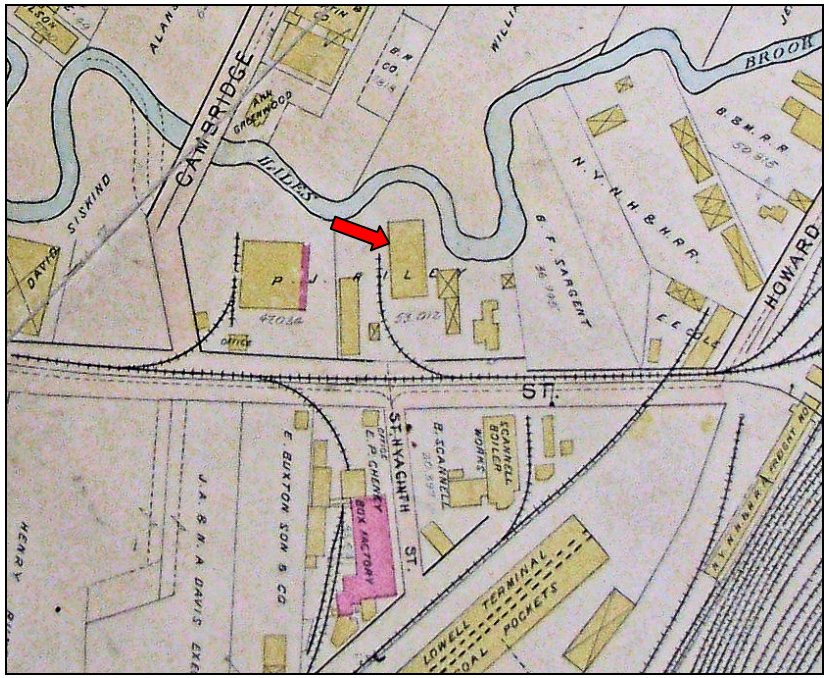
The sign on the building, which was erected ca. 1905, reads "Lawrence Paper Fibres Company," which operated here beginning in the 1960s. It occupies the site of the Lowell Boiler Works, which was purchased in 1901 by Patrick J. Riley from Richard Dobbins, the owner of the boiler works. The property is currently owned by 41 Tanner Street Trust, Inc.

Description: This wood-frame building on Tanner Street was erected in ca. 1905 and contains a three-story section with a two-story section attached to the rear. It originally served as a warehouse for cotton and waste paper, and possibly discarded machinery. The building has a slightly pitched roof and a wood-frame tower for a freight elevator projects from the south façade. A covered loading dock extends along the entire length of the south façade of the building.



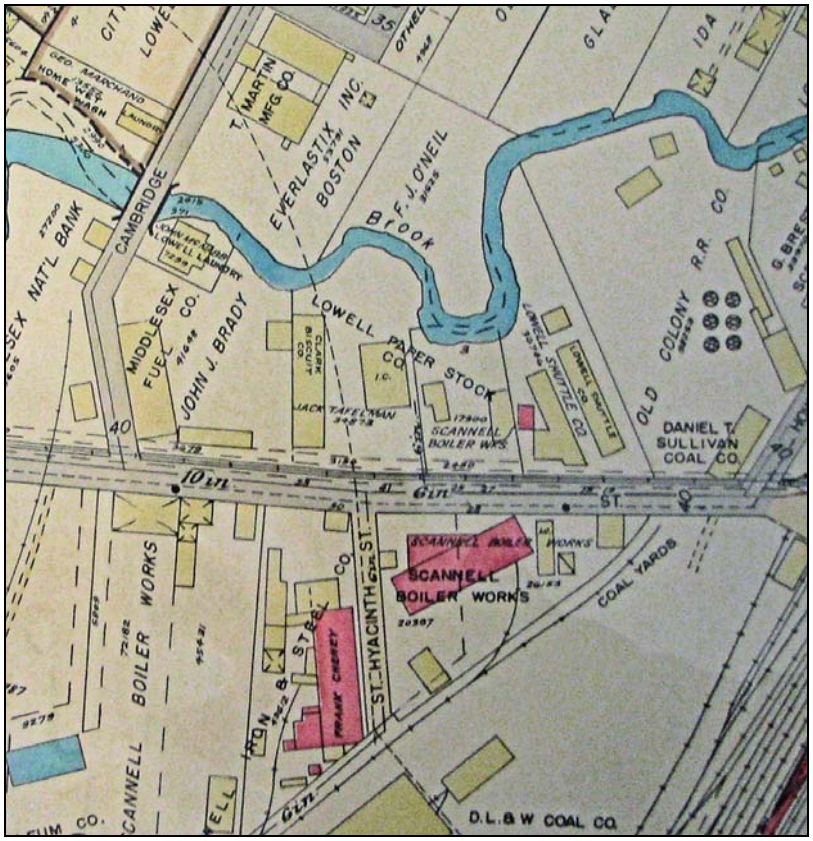
Location map.

Historical Significance: Born in Ireland in 1865, Patrick J. Riley immigrated with his family to the United States in 1874. They settled in Lowell and young Patrick, who had attended school in Ireland and was literate, began work in the Massachusetts Cotton Mills, followed by a stint in the Lowell



As this detail from a 1906 atlas of Lowell shows, Patrick J. Riley, Jr., owned two large parcels of land along River Meadow Brook, north of Cambridge Street and fronting Tanner Street. This was formerly the site of Richard Dobbins' Lowell Boiler Works. The one historic building that survives today is a wood-frame warehouse building (red arrow).

carpet mills. His father, Patrick J., Sr., operated a junk business with his uncle, Hugh (Patrick, Sr.'s brother). By 1881 the business was called Patrick J. Riley & Company, and operated for several years on Gorham Street. The junk business in Lowell and other cities was notoriously competitive as junkmen vied with each other for old machinery, metal, scrap cloth and paper, cotton waste, and even grease and animal fat. Many municipalities attempted to control junk firms by



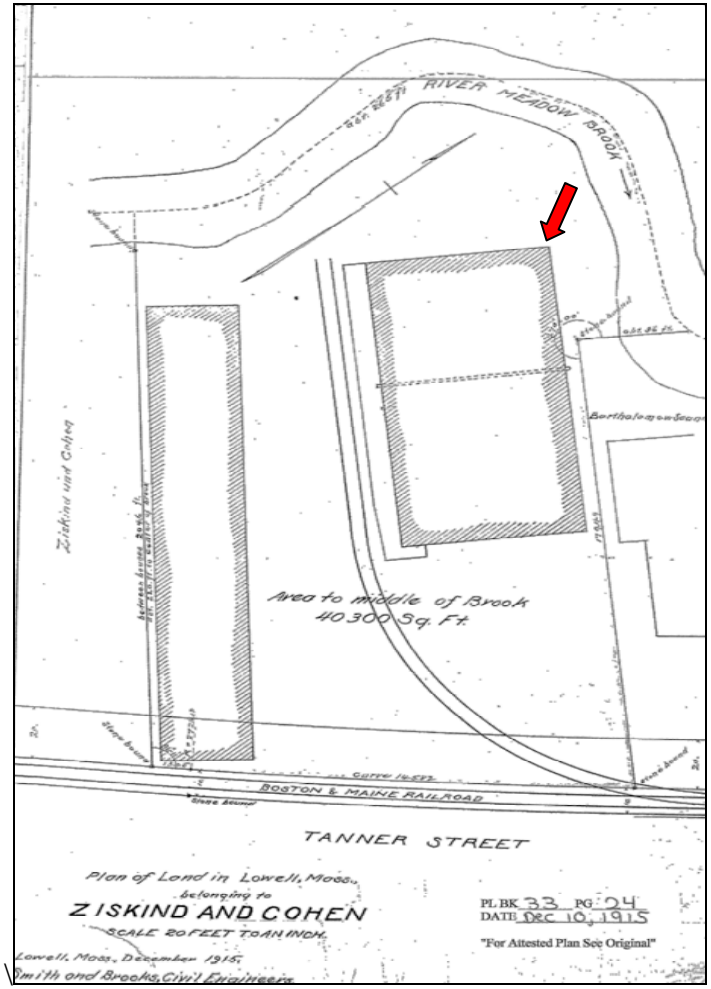
By 1936 Riley's property had been subdivided and was owned by a number of individuals including John J. Brady, Jack Tatelman, and Bartholomew Scannell. The Lowell Paper Stock Company, led by Samuel Kotzen and Israel Lebovitz, leased the warehouse property from Tatelman, a Lawrence businessman who purchased Kotzen's Tanner Street real estate in 1932.

requiring licenses and having inspectors examine junk yards. Enforcement, however, was often lax and bribing city officials to look the other way was quite common. Occasionally junk

men like Riley had brushes with the law. For example, in the summer of 1884 the police charged Riley with accepting stolen property. Despite such trouble, Riley's business prospered and he purchased property not only for his junk yard, but also for speculating in real estate.

In the 1890s, after his father's death, Patrick, Jr., took over the junk business. He was joined by his brother Hugh, who worked with him as the company's clerk. In 1896 Riley acquired a parcel of property from Richard Dobbins, next to Dobbins' boiler works on Tanner Street. About five years later, after Dobbins closed his business and moved from Lowell, Riley purchased the rest of Dobbins' holdings. He used some of the boiler works structures, including the small office building, for his junk business. Riley prospered and moved with his second wife from his Mount Washington Street home in the Acre neighborhood to Fairmount Street in the wealthy Belvidere area of Lowell. Around 1905 he erected a three-story wood-frame building at his Ayer's City junk yard to store cotton and paper wastes. Riley had a small crew of men at the yard and to drive the horse-drawn wagon for hauling junk.

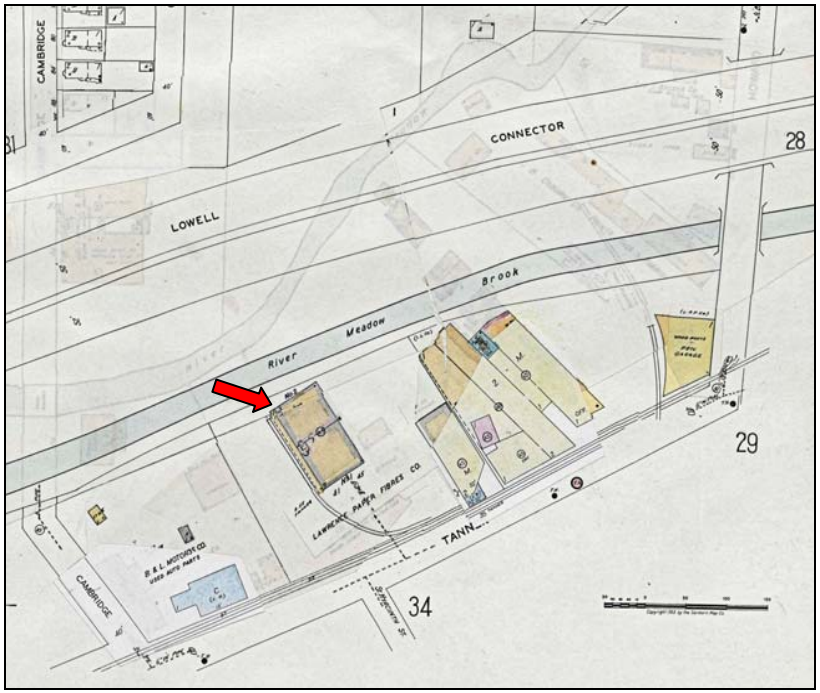
In 1915, two years after Patrick Riley's death from an intestinal blockage at the relatively young age of 48, David Ziskind, a successful junk dealer, purchased the Riley property from Riley's heirs. This transition reflected a broader change in Lowell in which Jews from Russia and Eastern Europe replaced Irish Catholics as the dominant ethnic group in the city's junk trade. Ziskind and his partner, Samuel Cohen, ran their firm for a few years at the site, on Cambridge Street, but also leased part of the property to fellow Jewish businessmen Samuel Kotzen and Israel Lebovitz who had formed the Lowell



This plan of the property by the brook on Tanner Street, owned by David Ziskind and Samuel Cohen, shows the warehouse building (red arrow) constructed by Patrick Riley around ca. 1905. This building stands today. The plan is from the Northern Middlesex Registry of Deeds and dates from 1915.

Paper Stock Company. Whereas Ziskind handled a range of junk, including used textile machinery, Kotzen and Lebovitz dealt primarily with scrap paper. In the mid 1920s Kotzen landed an agreement with the city of Lowell to collect all of the scrap paper generated by municipal employees, rather than send it to an incinerator. Ever the entrepreneur, Kotzen also established a specialty furniture company. Located in part of the Tanner Street warehouse building, the Lowell Specialty Company, capitalized at $15,000, produced card tables, light chairs and stools, and other kinds of inexpensive furniture. Between 15 and 20 employees were hired to manufacture these goods.

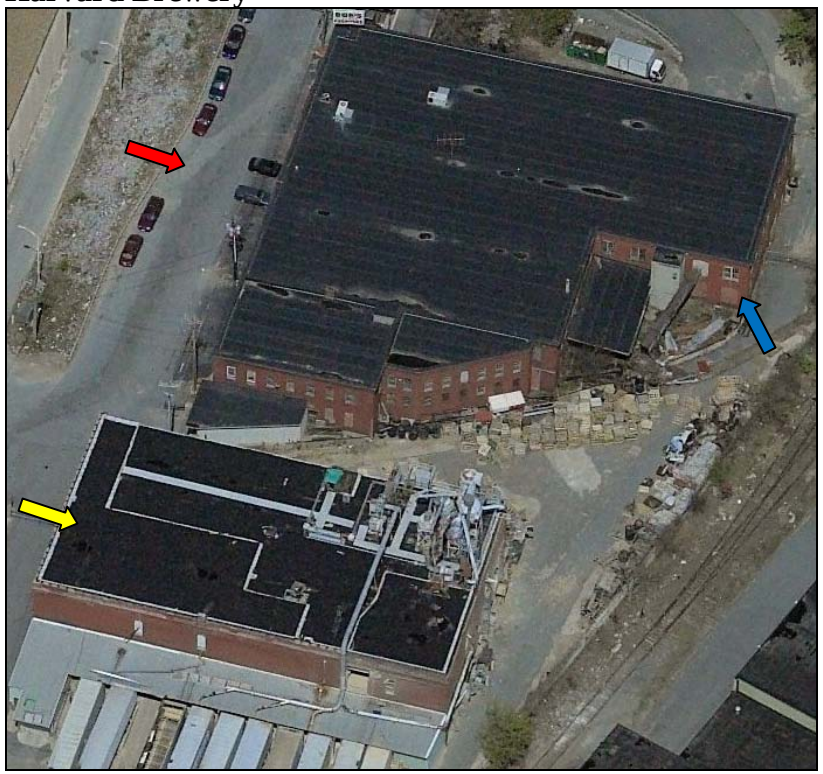
Joining Kotzen and Lebovitz in the Lowell Stock Paper Company was another Jewish scrap paper dealer, Jack Tatelman, who lived in Lawrence and owned the Lawrence Waste Paper Company. Kotzen's businesses prospered to the extent that he was able to purchase the Tanner Street property from Ziskind in 1925. Seven years later, however, at the depth of the Great Depression, Kotzen, like many other small businessmen in Lowell, was struggling and the Mechanics Savings Bank, which held Kotzen's mortgage, foreclosed on the property. Shortly thereafter Tatelman, acquired the land and buildings from the bank. Kotzen withdrew from the Lowell Stock Paper Company, but Israel Lebovitz remained as manager until his death in the early 1940s. The company was dissolved and David Silverman of Lawrence, who succeeded Lebovitz of the Lowell Stock Paper Company, ran the business under the Lawrence Waste Paper Company. By the 1960s this concern was reorganized as the Lawrence Paper Fibres Corporation, with Silverman managing the firm. This company



The former Patrick J. Riley warehouse (red arrow) is seen in this detail from a 1952 Lowell atlas (updated to 1977), which also shows the relocated River Meadow Brook.

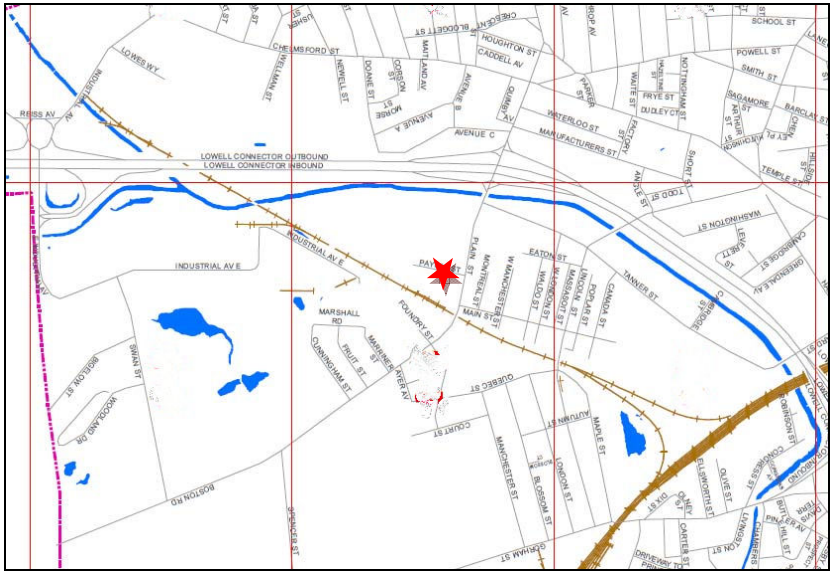
continued in business into the early 1970s, when it was reorganized as Recycled Fibers of Lowell. For a number years Robert L. D'Ambroise, who owned a large amount of real estate in Lowell, owned the property, but he fell behind in taxes and the land and former warehouse was acquired in the 1990s by Daniel J. Sheehan. The property is currently owned by 41 Tanner Street Trust, Inc.

Harvard Brewery



This aerial view shows the remains of the Harvard Brewery along Payton Street (red arrow). Among the surviving structures is part of the ale brew house (yellow arrow), erected ca. 1899. In addition part of the bottling plant (blue arrow) also stands.

Description: Of the buildings associated with the Harvard Brewery (originally the Consumers Brewing Company) that were constructed between 1893 and 1910, only two-stories of the formerly five story ale brew house and parts of the bottling plant survive. The remains of the ale brew house include the first two-stories, with brick walls and a stone foundation. For many years beginning in the late 1950s, the building was occupied by Louis O. Beede & Sons, Inc., a producer of sawdust. The company closed in 2011 and the factory is now vacant. The building that was once used as a bottling plant is also a two-story structure (originally four stories) with brick walls and a number of adjoining two-story brick buildings. Part of the old bottling plant is now used as a furniture store.



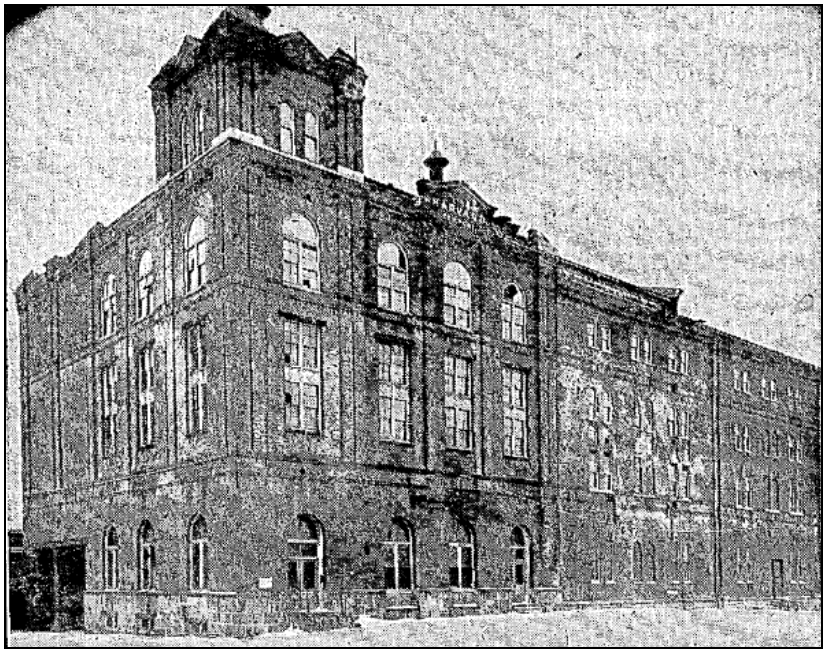
Location map.

Historical Significance: In addition to cotton textile mills, one of the earliest industrial buildings erected in Lowell was a brewery. Located off Thorndike Street along the Pawtucket Canal this brewery was completed in the 1820s and operated into the late 1840s. It would be more than four decades before another major brewery was built in Lowell. Led by a group of

Irish-American businessmen, most notably John Joyce and Maurice J. Curran of Lawrence, the Consumers Brewing Company was incorporated in 1893 with completion of the firm's brewery off Plain Street in Ayer's City the following year. It featured a five-story brew house of brick construction and stone foundation. Water for brewing beer was drawn from a series of wells along River Meadow Brook, which ran by the southern perimeter of the brewery property. When the brewery opened in April, 1894, about 100 men were employed there and over 10,000 people turned out to enjoy the company's festivities and sample Consumers beer.

During its initial years, Consumers beer proved popular and the company added new vats in the main brew house to increase production. But the firm apparently suffered from poor business management and the company's profits were modest. Around 1897 two Boston-based men, Ward B. Holloway and Richard C. Hemman, who managed the Rochester Brewing Company's East Coast interests, gained control of the Lowell firm. The following year Holloway and Hemman reorganized Consumers and renamed it the Harvard Brewing Company. Over the next ten years, the Harvard Brewery achieved steady profits and Holloway led in the expansion of the brewery operation. This included a second brew house for making ale, a new company office, and the hiring of more brewery workers. Holloway continued the tradition of hiring German brew masters in the production of lager beer and ale.

Despite scandal and even criminal indictment of Holloway, Hemman, and others connected to the brewery for the control of liquor licenses and the distribution of beer, Harvard Brewing remained one of the major breweries in New England through



This photograph of the original main brew house of the Harvard Brewery appeared in the *Lowell Sun* in 1933 when it reopened.

the First World War. With the beginning of Prohibition, in 1920 however, beer production ceased. Treasurer Richard Hemman and president James R. Nicholson, represented the Harvard Company (the stockholders approved the name change from Harvard Brewing Company to the Harvard Company in 1919) in the sale of the brewery to David Ziskind and Bartholomew Scannell for $175,000. Scannell initially proposed a slaughterhouse and meat packing plant for the closed brewery. But in the face of strong local opposition, along with a severe economic recession, Scannell dropped the plan. Instead, he helped organize the Harvard Warehouse and

Storage Company, which involved two of the city's cotton mill agents, Elmer L. Bowen of the Appleton Mills, and Albert D. Milliken of the Hamilton Mills, to use part of the old brewery for storing raw cotton and wool for the city's textile factories.

Apart from the warehouse company, Scannell and a group of local businessmen used the brewery to produce non-alcoholic beverages, including ginger ale and root beer. In addition they received a federal permit to produce "near beer." This proved to be unprofitable and at some point in the early 1920s Scannell and his partners began producing and distributing beer with an illegally high alcohol content. In August, 1925, federal agents and local police launched the largest raid on any illegal establishment in New England. A number of men at the brewery, including Scannell, were arrested and indicted for violating the Volstead Act. Several months later David Ziskind was also indicted, having been charged with conspiracy to manufacture and sell beer. Although charges against Scannell and Ziskind were eventually dropped, they suffered financial losses. (Ziskind, who was overextended in other business ventures, declared bankruptcy. Although he eventually recovered by 1928 his financial and legal struggles undoubtedly contributed to his failing health and he died in 1929 at the age of 51.) Unable to pay the mortgage held by the City Institution for Savings, Ziskind and Scannell lost the Harvard Brewery and the bank sought a buyer for the property.

Despite announcements in major newspapers to sell the brewery, no buyer emerged until 1932. With the end of Prohibition near, a newly organized Harvard Brewing Company, controlled by the Wall Street investment firm Hallgarten & Company, purchased the land and buildings from

This view of the former ale brew house is looking southwest and clearly visible are the remaining two stories of the once five-story brick building. Note the rounded arch windows at the second floor level. These are typical of windows in both the original main brew house and the five story ale brew house.

the bank for about $200,000. The new ownership group was composed largely of German and German-American men including automobile manufacturer Fritz von Opel and banker Walter Blumenthal. The chairman of the board of Harvard Brewing was German-born Theodore Hoffacker, who brought in Erwin F. Lange to serve as company president and oversee the reconditioning of the brewery. (Of German parentage, Lange was born in New York and married Louisa Piel, a daughter of the wealthy German-American brewer Michael Piel, who, along with his brothers, established the highly popular Piel's Beer in 1880s New York City.) Nearly two million dollars was expended to modernize the brewery and in 1933 it opened with 300 employees. It was the largest employer in Ayer's City.

This is a view of the east façade of the former bottling plant, looking west.

Although initially profitable, the Harvard Brewing Company slumped after only a few years and in 1937 Van Opel, having a majority of shares in the firm, gained control. Van Opel retained the services of local manager Walter E. Guyette who oversaw the installation of a modern beer canning line in 1938. The fortunes of the company improved, but soon after the United States entered World War II, federal agents arrested Van Opel as a "dangerous alien" with ties to Nazi Germany. The federal government confiscated the Harvard Brewery and while it continued to run under the supervision of Guyette, it was considered property of the U.S. government.

The brewery remained in government hands until 1956 when it auctioned off the property. A Florida firm, the Fort Knox Construction Company, led by Bernard J. Harris, purchased the brewery but then sold it to the Hampden Brewing Company of

The bottling plant included a number of adjoining brick buildings as seen in this view of the south and east façades, looking northwest.

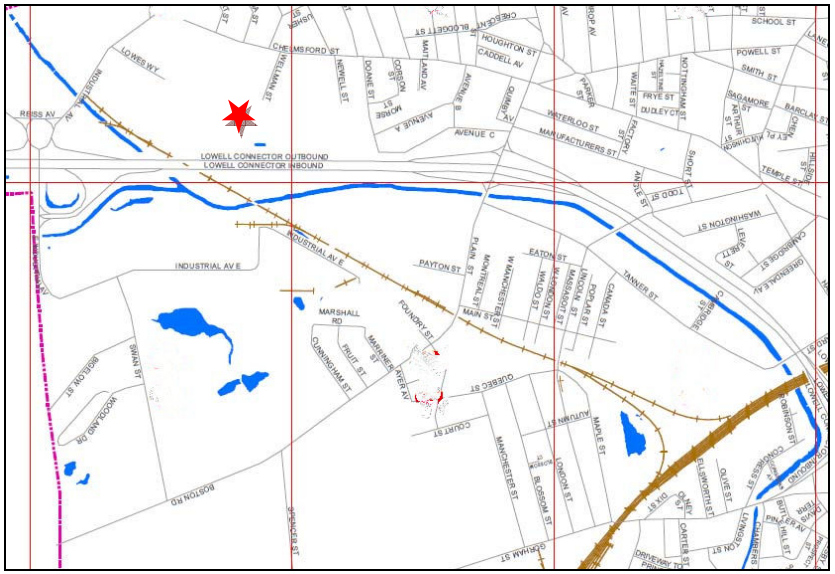
New York City. While Hampden operated a bottling plant for a short time in Ayer's City it did not resume beer production. Instead it scrapped the machinery and then sold the empty buildings to Louis O. Beede of Lynn, Massachusetts, a producer of sawdust and wood products. The main brew house, which, for some Lowellians, had become a landmark building, suffered two fires, the second occurring in 1961 and resulting from a sawdust explosion that seriously injured three of Beede's employees. The severely damaged brew house was then demolished. Today only two-stories of the ale brew house survives, along with a large section of the bottling plant. Louis O. Beede & Sons went out of business in 2011 and the ale brew house is now abandoned. A discount furniture occupies the other part of the historic brewery.

City Farm

This aerial view shows the site of Lowell's poor farm.

Description: None of the buildings survive from the city's poor farm and hospital, which, in the 19th century, included some 150 acres of land along River Meadow Brook. The Lowell Connector extends over much of the site and other sections are now part of office parks and parking lots.

Historical Significance: Lowell was still a town in 1832 when its selectmen, including Joshua Swan, voted to establish a poor farm to shelter and feed its growing indigent population. The following year the town purchased most of the 200-acre Joseph Pierce farm along the Lowell-Chelmsford line. The sale included the farm buildings overlooking River Meadow Brook.



Location map.

In 1835 Lowell's selectmen approved a measure to erect an almshouse of brick construction and a wood-frame barn at a cost of $6,000. During the first few decades of its operation the almshouse contained about three-dozen inmates. From the outset, a large number of the men, women, and children who resided here were Irish immigrants. The city appointed a married male superintendent and his wife to oversee the almshouse and farm. From the mid 1830s to 1860 the tenure of superintendents averaged about five years each. Throughout this period six different superintendents, all native-born Protestants, resided with their wives at the poor farm. They used both inmates as well as paid day laborers to cultivate between 20 and 25 acres of land, and produce potatoes, turnips, onions, carrots, squash, corn, and tomatoes. In addition, the

poor farm included a small fruit orchard with apple and pear trees.

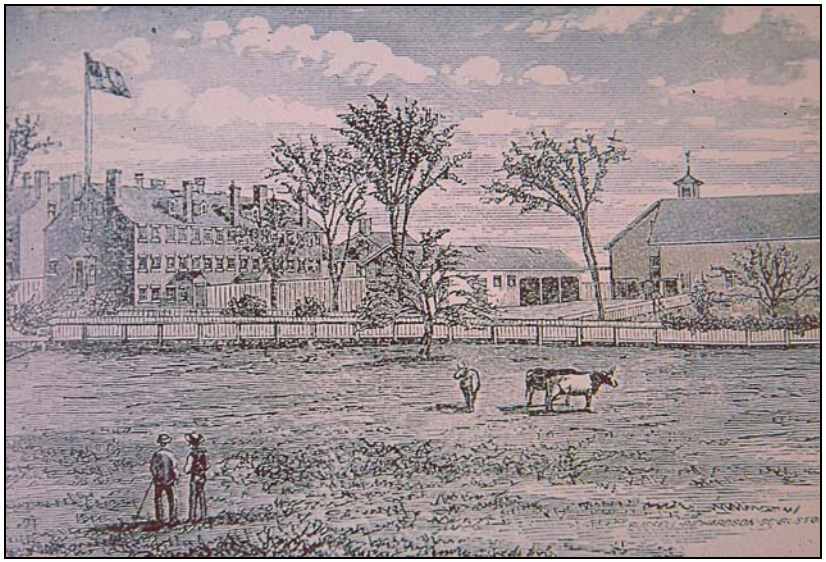
A major change at the poor farm occurred in 1850s when the city established a reform school for children and a workhouse for adults. For Lowell's reform school, the third one established in the state of Massachusetts, the city hired a master to educate and discipline young boys and girls who were sentenced by the city's Police Court to terms ranging from six to 15 months. Most were charged with "habitual truancy" from public schools and the majority of the reform school population was boys, aged 7 to 14 years old, from working class or poor families. Other charges included larceny, "stealing fruit," assault, and "driving off team" (namely, stealing a horse and wagon). A few girls were also sentenced to the reform school with most being charged with "stubbornness," which covered a range of infractions notably refusing to obey their parents. The population of the reform school averaged about 50 boys and girls each year and it operated at the poor farm until 1896 when a new institution was built in another part of the city.

Similar to the reform school, the workhouse was a punitive institution to which adult males and females were sentenced by the judge in Lowell's Police Court. Most of the workhouse inmates were convicted of drunkenness, though some had violated vagrancy laws or were guilty of petty crimes including larceny. While men in the workhouse were often required to perform heavy, physical labor, women generally were assigned such tasks as cleaning, sewing, and cooking. Typically sentences to the workhouse amounted to three months and a large number of those sent there were Irish men and women. For example, in the 1850 federal census that included inmates of Lowell's poor farm, 14 of the 19 convicts in the workhouse were born in Ireland.

Although during the antebellum period the city typically reported favorably on the treatment of inmates at the poor farm, occasionally word of cruelty, visited especially upon the Irish, spread into the community. In perhaps the most notorious case, an Irishmen named Mullen who was in the almshouse sued the superintendent John Frye for physical abuse and cruelty. Frye had allegedly ordered Mullen from his sickbed in the almshouse, took him into a room with the windows open, and, while exposing him to the cool air, forced him to strip naked. Frye then had another Irishmen scrub the ailing Mullen with a "common corn broom" in a tub of chilly water as Frye stood by and doused the shivering inmate with a bucket of cold water. With attorney Benjamin F. Butler representing Mullen before a judge in the Court of Common Pleas in September, 1850, details of Frye's actions quickly reached members of the city's Irish community and at midnight on the same day as the trial a mob traveled to the poor farm and began to shower the almshouse with bricks and stones. An assistant to Frye, Lorenzo Phelps, confronted the angry crowd but was quickly set upon and thrown to the ground. Phelps fired two shots from his pistol whereby his assailants scattered. No arrests were made in the attack upon the almshouse, but a jury found on behalf of Mullen, while awarding him just one cent in damages.

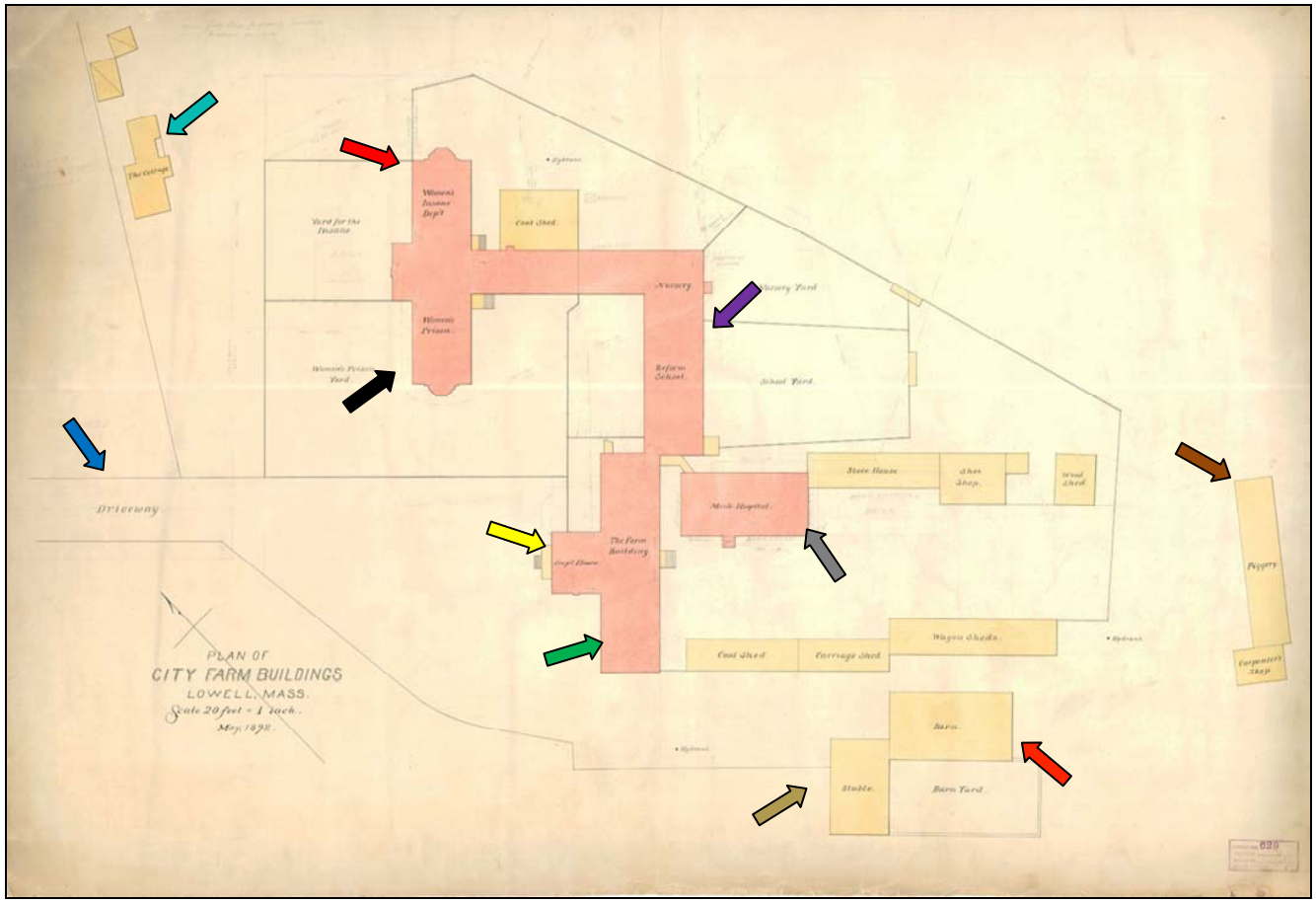
Phelps recovered from his injuries and when Bickford Lang, successor to Frye as superintendent, retired in 1860, the Overseers of Poor who administered the poor farm, elected Phelps in Frye's place. He would become the longest serving superintendent in the history of the institution. During Phelps' tenure which ended in1882, there were few made to the poor farm. One exception was the workhouse, which the city suspended in 1859, in part because of the expense of running it alongside the almshouse. In 1872, the city council reinstituted this punitive institution and convicts, most of whom were guilty of public inebriation, quickly filled the workhouse. The number of men and women sent there each year averaged about 75, with the majority having sentences of three months.

Apart from overseeing the workhouse and the reform school, which was conducted by William A. Lang, Phelps slightly expanded the amount of land placed under cultivation and the farm became increasingly productive. Paid laborers and men sentenced to the workhouse filled in some of the bog meadows in the vicinity of River Meadow Brook using gravel, sand, and loam, and planted hay in these low-lying areas. Each year between 20 and 25 acres of farm land yielded various crops most notably potatoes, squash, onions, beets, parsnips, and peas. The poor farm also gained a reputation for producing very flavorful strawberries. In addition, by the late 1870s, the livestock included six cows, six horses, and 14 pigs. Phelps and subsequent poor farm superintendents kept a yearly tally of the amount of agricultural goods produced in part to demonstrate to the city council that the institution was well run while minimizing its financial liability to taxpayers.



This engraving of the poor farm dates from the 1880s soon after the brick buildings (to the left) were completed. The construction of these buildings marked the most extensive series of improvements to the poor farm in the 19th century. (Image courtesy of Kim Zunio, Lowell Historic Board, city of Lowell.)

It was during the administration of John J. Donovan, a Democrat and Lowell's first Catholic Irish-American mayor, that the city carried out a major renovation of the poor farm. Lowell architects Merrill & Cutler executed the design of these buildings which were completed in 1883. Along with these major improvements the staff expanded to include a "head farmer" who supervised the paid farm laborers and workers from the almshouse and workhouse. Although charges of political favoritism centering on the election and removal of superintendents, the hiring of the small staff, and contracting for other goods and services had arisen over the decades,



As shown in this plan of the city farm buildings from 1892, the driveway (blue arrow) off Chelmsford Street led to the main entrance of the series of connecting brick buildings. This included the superintendent's quarters (yellow arrow) and Farm Building (green arrow), in which the almshouse was located. Among the other buildings were Men's Hospital and Workhouse (grey arrow), the Reform School and Nursery (purple arrow), the Women's Hospital (red arrow), and the Women's Prison (black arrow), which was the workhouse for women convicts. The barn (orange arrow) and stable, (tan arrow) along with the piggery (brown arrow), and other out-buildings were of wood-frame construction. The wood-frame cottage (aqua arrow) served as the residence for the teacher and chaplain of the reform school. ((Plan courtesy of Kim Zunio, Lowell Historic Board, city of Lowell.)

attacks increased at the outset of the Mayor Donovan's administration. Phelps had resigned the year Donovan was first elected and his successor, Albert Pindar, served for nearly a decade that was punctuated with charges of corruption and mismanagement, mostly from local Republican politicians. In 1893 the Overseers of the Poor ousted Pindar and elected in his place Cornelius E. Collins, the first Catholic to head the poor farm.

The tenure of the succeeding superintendents averaged only about three years. Accompanying this more rapid turnover were a number of changes to the administration and function of the poor farm. The reform school closed in 1896 and nine years later the workhouse was abolished in the wake of a state law that prohibited institutions from housing both paupers and convicts. In 1906 the city council eliminated the Overseers of the Poor and placed a newly created non-partisan board of charities in charge of the poor farm. While agricultural goods continued to be produced on the grounds, the institution became known more as a hospital for the indigent and chronic alcoholics. In fact, by the 1910s the city renamed the poor farm the Chelmsford Street Hospital.

Despite its changing role in the city, the Chelmsford Street Hospital never lost its reputation as a grim and frequently rough-and-tumble institution. Its medical services were often strained as the staff, which by the 1920s included a resident physician, had to care for the many impoverished and severely ill patients. Conditions were worsened by occasional fights between drunken or mentally ill inmates. In the late 1930s after one particularly vicious brawl a judge ordered Lowell's deputy police chief "to clean the place out" and calling it a disgrace to the city. Nonetheless, such disturbances continued sporadically over the years. After World War II, the city renamed the institution the Francis Farris Memorial Hospital, after a Lowell soldier who was killed in France in 1944. Although in the 1950s Lowell's city manager explored various proposals to improve the facilities, no major work was carried out. Beginning in 1957, with pressure mounting among city and business leaders to close the hospital, city manager Frank Barrett ordered the transfer of patients to the Tewksbury State Hospital. The following year, with the neighboring Lowell Industrial Park seeking to expand its property, the city council agreed after several contentious hearings to shut down Farris Memorial Hospital. The council agreed to final closing date that coincided with the retirement of the superintendent Arthur G. DeLorme. The institution that had served or incarcerated thousands of Lowell's struggling population for over 120 years closed its doors. A fire just a few months later destroyed the main building and the rest of the structures were subsequently torn down.

Today nothing remains of Lowell's poor farm. The Lowell Industrial Park which occupied part of the farm land beginning in 1953, was extended to north and east along River Meadow Brook. Construction of the Lowell Connector in 1960-63 further obliterated the poor farm's agricultural land and bog meadows. The more recently constructed large building and parking lots for the hardware and home improvement company, Lowe's, stand on the site of the poor farm buildings. No marker or plaque exists to commemorate the once important though often reviled city poor farm.

Appendix 2: Timeline of Important Events

1647 Reverend John Eliot visited members of the tribes of the Pennacook Confederacy at Pawtucket Falls

1653 Eliot helped establish Wamesit reservation, between the Merrimack and Concord Rivers, in the vicinity of Pawtucket Falls and River Meadow Brook, as Indian land; it was one of the seven "Praying Villages" Eliot initiated in the Massachusetts colony

1654 A group of colonists, including Benjamin Butterfield who arrived in the Massachusetts Bay Colony in 1638, settled on land alongside the Wamesit reservation. (NE Historical & Genealogical, v44, p33) Butterfield's property includes part of what became Ayer's City

1656 Samuel Adams granted 450 acres of land about two miles southeast of Chelmsford Center. Adams constructed a dam on Great (or River) Meadow Brook and a sawmill to exploit the timber resources. Five generations of the Adams family operated a saw and gristmill at this site, which was purchased by Abbott Russell in the 19th century. Russell Mills ceased running in 1899

1675 King Philip's War commenced and many of the Pennacooks in the Wamesit reservation fled with Chief Wannalancit to northern New England. The Pennacooks who remained suffered at the hands of colonists as well as Indians allied with King Philip. By 1677 the few surviving Indians at Wamesit reservation departed.

1686 Jonathan Tyng and Thomas Hinchman purchased lands of the Wamesit reservation. They and 44 of their townsman, including the brothers Nathaniel and Samuel Butterfield, sons of Benjamin, formed the Proprietors of the Wamesit Purchase, and divided the property, as well as managed the lands. The Proprietors subsequently constructed roads, fenced the lands, and established common pastures and fishing areas along the Pawtucket Falls of the Merrimack River.

1700s In the early 1700s land along River Meadow Brook was occupied by farms; a causeway, constructed in the mid-1600s and extending across the brook where Plain Street now runs, was one of the principal roads through this area.

1714 The Proprietors of the Wamesit Purchase constructed a dam and sawmill at the falls on River Meadow Brook near the site that later became Hale's Mills.

1726 Lands of the Wamesit Purchase, which were part of Chelmsford Neck, became part of Chelmsford when, by action of the General Court, the "Neck" was annexed to the town. This area was subsequently called East Chelmsford.

1740s English immigrant Joseph Peirce, who had settled in Chelmsford along River Meadow Brook in the 1720s and was a slaveholder, probably built a dam, grist mill, and saw mill at the largest falls on the brook.

1790 Moses Hale acquired a farm from Herbert Moor in Chelmsford near the farm of his father-in-law Moses

Davis. Hale soon after established a fulling mill at the existing dam on River Meadow Brook.

1792 Hale constructed a second dam on the brook a short distance upstream dam and fulling mill. He also erected a water-powered grist and sawmill at this site.

1801 Hale established a water-powered carding mill at Hale's Mills, the first in the area.

1818 Hale formed a company with two partners and initiated the manufacture of gunpowder at the lower dam. Oliver Whipple hired to superintend this gunpowder works.

1821 Oliver Whipple, backed by William Tileston and David Hale, oversaw the construction of a waterpower canal along the Concord River.

1822 "Whipple Canal" completed along with Whipple's gunpowder works, powered by water from the canal. This occurred the same year that Lowell's first waterpower canal was completed and the Merrimack Mills began producing cotton cloth.

1823 Moses Hale reconstructed the upper dam on River Meadow Brook, adding several inches to its height.

1826 Lowell formally established as a town, its land carved out of East Chelmsford. The village at Hale's Mills was included in the town of Lowell.

1828 Moses Hale died at the age of 63. He was heavily in debt and some of his property was assigned to Joel Adams of Chelmsford. Hale's sons, Bernice and Perley, assumed control of the upper dam, grist mill and water rights formerly held by their father. Within about two years Cyrus Chambers began a dye works on the east side of Gorham Street near the upper dam.

1829 Oliver Whipple acquired the lower dam and associated gunpowder works from Joel Adams, executor of the Hale estate.

1830 Joshua Swan, a contractor at the Lowell Machine Shop, purchased the Hale estate at auction from Joel Adams.

1832 The Lowell Bleachery was established along River Meadow Brook below the lower dam. The bleachery used water from the brook and from wells to process cloth.

1833 The city purchased land from Joseph Pierce and established a poor farm along the brook at the Chelmsford line.

1834 Boston & Lowell Railroad completed. Its line crossed River Meadow Brook near Hale's Mills, ran across Gorham Street, near the Lowell Bleachery, and spanned the Concord River en route to Boston.

1841 Bernice and Perley Hale filed for bankruptcy. Whipple acquired Hale's Mills property and water rights from Nathaniel Stevens, assignee of the Hale brothers' estate.

1843 English émigré Joshua Mather, formerly a printer at the Merrimack Mills' Print Works, began manufacturing carpets at a small factory adjacent to the lower dam off Chambers Street.

1850 Real estate speculator Daniel Ayer initiated his development of “Ayer’s New City” and convinced the Boston & Lowell Railroad to build a spur line along Tanner Street. That same year Joshua Mather acquired from Oliver Whipple the upper dam, mill property, and water rights of River Meadow Brook formerly held by Moses Hale. The area around the dam became known as Mather’s Mills.

1855 Oliver Whipple ceased the manufacture of gunpowder on the Concord River.

1856 Ephraim Patch, Whipple’s agent, oversaw a series of improvements to the Whipple Canal that were carried out over a seven-year period. This included widening and deepening the canal and extending it up River Meadow Brook to the Lowell Bleachery.

1862 The Belvidere Woolen Mill No. 2, led by Charles Stott, was completed along the Whipple Canal on the west side of Lawrence Street.

1864 A fire destroyed the original tannery in Ayer’s City built by Daniel Ayer. Later that year, Elbridge Cook erected a new tannery at the same location. That same year Harvey B. Chase and Hocum Hosford formed a woolen company, building the Chase Mills along the Whipple Canal.

1865 Benjamin Butler and a group of local businessmen formed the Wamesit Power Company, acquiring the canal and industrial properties formerly held by Oliver Whipple. The Whipple Canal was renamed the Wamesit Canal.

1871 The Framingham & Lowell Railroad was completed through Ayer’s City.

1872 Oliver Whipple, who was involved in much of the industrial and residential development in the lower section of River Meadow Brook, died at the age of 77.

1873 Josiah Butler acquired the mill property, dam, and flowage rights of River Meadow Brook from the Mather heirs. He initiated the Lowell Waste Company, producer of cotton batting. The firm operated at this site until the late 1950s.

1874 The Lowell & Andover Railroad completed its line and its railroad station on Central Street in downtown Lowell. The railroad included a connecting line from the Concord River, through Ayer’s City, to the Framingham & Lowell road.

1875 Darius Whithed erected a coal terminal in Ayer’s City, the first in this locale.

1879 Arey, Maddock & Locke assumed control of the largest tannery in Ayer’s City.

1880 The Chase Mills destroyed by fire and Luther W. Faulkner acquired the property. He then built the Faulkner Mills on this site.

1881 Richard Dobbins and Scannell & Wholey established competing boiler manufacturing concerns on Tanner Street in Ayer’s City.

1883 The city completed constructed of two large brick buildings at the poor farm. This represented the largest

expansion of the hospital and almshouse in 19th century Lowell. That same year the Boston & Lowell Railroad erected a brick roundhouse next to the brook adjacent to Howard Street.

1884 The city completed the intercepting sewer that drained parts of Ayer's City and the Highlands area of Lowell, dumping the effluent into the Concord River, below Massic Falls.

1886 A financial scandal at the Lowell Bleachery led to a reorganization of the company and new management brought into Lowell.

1892 The Engle Crematory erected on Plain Street in Ayer's City. That same year the Arey & Maddock tannery on Tanner Street, the largest in Ayer's City, closed. It had been one of the major polluters of River Meadow Brook.

1893 The Lowell Board of Health surveyed and reported on the condition of River Meadow Brook. It marked the first substantial study of the stream and called attention to the brook's heavily polluted waters.

1894 The Cook Well Company completed construction of a series of tubular wells along the brook in Ayer's City at the Chelmsford line. Wells from this aquifer began supplying water to the city of Lowell. That same year the Consumers Brewing Company, subsequently renamed the Harvard Brewery, began operations along Plain Street and also drew water from the aquifer. Also, the Standard Oil Company established a petroleum storage and distribution facility in Ayer's City. It was the first large-scale oil storage operation in Lowell.

1902 The Lowell Coal Terminal, the largest in New England, was constructed in Ayer's City, replacing the old Whithed coal elevator.

1916 The Massachusetts Board of Health conducted a study of River Meadow Brook and reported on the problems and sources of pollution of the stream.

1926 U.S. Cartridge Company, a major client of the Wamesit Power Company, closed its Lowell factory.

1927 The American Woolen Company closed its Bay State Mills, located along the Wamesit Canal. The Wamesit Power Company purchased the vacant factory but razed it in 1937.

1930 The Lowell Bleachery closed.

1933 The Harvard Brewery, which closed at the outset of Prohibition, reopened and began producing beer.

1938 Under the auspices of the Works Progress Administration (WPA) a crew of men carried out a channel improvement project of River Meadow Brook south of Plain Street, near the Harvard Brewery.

1939 Prince Macaroni Manufacturing Company moved into the bleachery site and began producing pasta. That same year a WPA project involving a large-scale dredging, cleaning, and channel straightening of River Meadow Brook was funded. The proposed work included the removal of the Butler dam (formerly the

Hale's Mills dam) at Gorham Street. The project, however, was not undertaken.

1952 New Industrial Plants Foundation, Inc., established and began planning an industrial park on part of the poor farm property, which it acquired from the city. One year later this concern completed its first industrial building and sold it to the CBS Hytron Corporation.

1956 The Lowell Coal Terminal was destroyed in one of worst fires in Ayer's City. An arsonist started the blaze.

1957 Harvard Brewery closed and four years later a fire destroyed the original brew house.

1958 The city's poor farm, renamed Farris Memorial Hospital in 1947, closed after operating for nearly 125 years.

1959 The state began construction of the Lowell Connector, relocating River Meadow Brook from the interchange with I-495 to Gorham Street. Completed three years later this project entailed the demolition of many residential buildings, as well as the removal of the dam at Hale's Mills, replacing it with a concrete dam at the same location.

1966 Residents of Ayer's City and a few city council members oppose the Tanner Street urban renewal project that was to be included in the Hale-Howard redevelopment. They succeeded in defeating the Tanner Street part of this initiative.

1977 The Silresim Chemical Corporation abandoned its hazardous waste recycling plant on Tanner Street, leaving behind a heavily polluted site with thousands of steel drums, many containing highly toxic liquids.

1979 The Wamesit Power Company was ended with the sale of the firm's canal and industrial property to Kenneth Scagel of Billerica.

1982 The EPA declared Silresim a Superfund site.

1993 L'Energia Limited Partnership, a Delaware corporation, completed a cogeneration plant on Tanner Street.

1997 Borden, Inc., which acquired Prince Pasta in 1987, closed the pasta factory.

2001 Stoss Landscape Urbanism undertook a planning study of Tanner Street, in conjunction with the Silresim Superfund site, and produced an award-winning landscape design that incorporated River Meadow Brook into the various landscape elements. It marked the first formal study in which the brook was viewed as an environmental asset rather than a nuisance.

2012 A second planning study, with funding provided by the EPA and examining the Tanner Street corridor, began.