



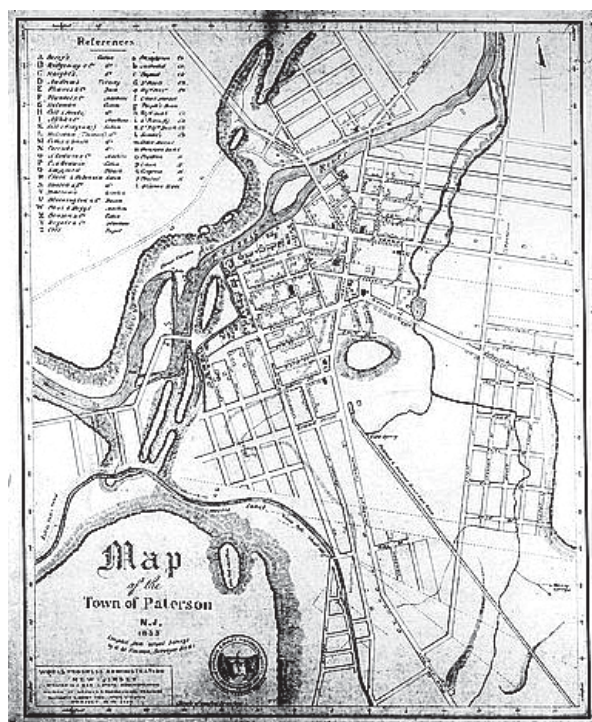
Chapter Two | Historical Overview and Resources

Overview & Resources

Special Resource Study | Great Falls Historic District | Paterson, New Jersey

Historical Overview and Resources

The Context for Early Industrial Growth in America	11
Alexander Hamilton and the Society for Establishing Useful Manufactures	15
Paterson's Beginning	18
Recovery and Reversal	21
Power for the Mills	23
Major Industries, People and Events at the Great Falls	25
Locomotive Manufacturing	26
Samuel Colt and the Gun Mill	28
John Holland and the Submarine	30
John Ryle and "Silk City"	32
The Silk Strike of 1913	34
Cotton, Flax, Paper, Hemp and Jute	36
A Final Note on the S.U.M.	38
Historic District Resources	39



Photocopy of Map: Town of Paterson, New Jersey: 1835. HAER, Library of Congress.

The Context for Early Industrial Growth in America

The industrial revolution began in England with technological advances in textile productions. During the mid-eighteenth century the production of woolens was England's chief industry, the first stages taking place primarily in the homes of individual spinners and weavers, then finished with bleaching and fulling in small mills with water power. Fulling involved removing grease and oils from wool, using a tub filled with water and detergent, after which a water wheel powered pair of wooden mallets would beat the cloth in the tub for days, shrinking the cloth and compacting the weave. Clothiers facilitated the movement of the farmer's wool to the homes of the spinners and weavers, and then to the tiny fulling mills. Entire families were engaged in this manufacture and sustained by its income.

The first step in speeding the process towards industrialization was the invention of the flying shuttle, by John Kay in 1733. The flying shuttle allowed one man to operate a loom, rather than two as had previously been required. In 1769 Richard Arkwright, building on the work of Lewis Paul, developed an automatic spinning machine. In 1774, a mill was set up to use Arkwright's machine. Improvements followed quickly, leading to James Hargreave's "spinning jenny" and then to the "spinning mule" developed by Samuel Crompton. This led to an excess of yarn, which was addressed by Edmund Cartwright's inventions and patents for mechanical weaving machines in 1785 and 1787.

The Great Falls Historic District Historical Overview and Resources

This chapter explores the history and resources of the Great Falls Historic District. It is not meant to be an exhaustive analysis of this historically special American place. Rather, it provides an overview for public understanding of the major events and people that contributed to the national significance of the Great Falls Historic District. Since the Great Falls is a congressionally designated Historic District and a National Historic Landmark, the analysis provides a brief background of why these very appropriate designations have been made.



Woollen Manufacture : Spinning Jenny. The Picture Collection of the New York Public Library
Source Note: From *The cyclopedia: or, universal dictionary of arts, sciences and literature*. (Philadelphia: Bradford, 1810-1842.) Rees, Abraham (1743-1825), author. Digital ID: 825894

A need arose for greater amounts of power required for these machines. Waterpower had been utilized for fulling mills since the Middle Ages. However, since the topography and waterways of England were not sufficient to produce the necessary power for larger operations, England turned to the development of the steam engine to power its textile mills. In the United States, the use of steam engines in manufacturing trailed because there was abundant and cheap water power, and good site selection on any number of rivers preempted the need for the more expensive steam power for many more decades.

Technological advancements also affected the supply and distribution of labor, which had initially been centered in the rural economies of the manor, where raw materials and labor were in close proximity, and an established pattern of home manufactures and local trade that existed since the Middle Ages. The early

fulling mills, which relied on water power produced from available streams, were also rurally located. The new manufacturing technologies led to the demand for concentrated labor and development of early manufacturing cities, such as Manchester. Later, as the steam engine eliminated the siting constraints inherent in waterpower, manufactures moved to existing urban areas and concentrations of labor.

Many of the thirteen colonies in North America were established in part to further the mercantile ambitions of England, specifically by supplying raw materials to English manufactures, and a market for the finished manufactured goods. Early colonial outposts were generally established in ports that could support this exchange. In order to maintain that profitable status quo, England endeavored to obstruct manufacturing in the colonies.

Protectionist legislation advanced by the English manufacturers and labor interests had an enormous impact on the economic configuration of the colonies, banning exports of manufactured goods from their shores. Among them included the Woolens Act of 1699 that prohibited colonial export of woollen cloth and the Hat Act of 1732 that prohibited colonial export of hats. Additionally, technology and the skilled labor familiar with the new industrial technologies were banned from export from English shores. Capital necessary to fund the establishment of manufactures was controlled by European capitalists and banks.

The lack of American banks significantly impaired the establishment of credit, not only personal, but public credit. The Banks of England and Amsterdam, among others,

underwrote not only manufacturing at home, but mercantile adventures abroad in the various colonies. As Alexander Hamilton wrote in a 1781 letter to the fledgling nation's new superintendent of finance, Robert Morris, such banks underwrote state power by financing the English military with a "vast fabric of credit." National credit was necessary to underwrite functions of government, as much as a system of personal credit and capital were necessary to establish new manufacturing and mercantile endeavors. These issues dogged American manufactures into the early years of the Republic.

Two other factors would eventually affect the potential for manufactures as the colonies broke away from British rule: raw materials and labor. Initial forays into mechanized textile labor identified women and children as sources of cheap labor, children being employed by Arkright in his early mill. In colonial America the extraction and production of raw materials for export were initially the chief demand for labor. The population of the colonies was limited, and economic growth depended on indentured servants, enslaved Africans, and new immigrants.

Business companies were slow to start. The first American business company was probably *The New London Society United for Trade and Commerce*, chartered in 1732-33. While there is question about its corporation status, it carried on many trade activities. Companies in colonial America were to become more common and dealt in various industries such as fishing, mining, simple manufactures, banking, land, trade with "Indians," and transportation.

Manufacturing companies were few in number, but existed as early as 1642, such as the

Massachusetts *Undertakers of the Glass Works*. Over one hundred years later in 1748 the *United Society for Manufactures and Importation* formed in Boston to produce linen, followed closely in 1751 by the *Society for Encouraging Industry and Employing the Poor* in the same city. In 1775 the *United Company of Philadelphia for Promoting American Manufactures* was formed and manufactured chiefly linens. While some ventures were already underway, not one had set out to aggressively pursue large-scale manufacturing on par with that of Britain.

The protectionist conditions established by England were fully in place when the American colonies began to establish their freedom from the Crown. During the Revolutionary War, access to capital and supplies were major limitations in the struggle for nationhood. The end of the conflict found the emerging nation in a newly established Confederation, seriously encumbered by debt, without unified power to generate revenue, lacking an effective executive, and fragmented along state lines with each state largely determining economic policy in accordance with its own self interest. It was not until soon after the U.S.

Constitution was ratified in 1789 that America seriously began its journey towards economic, as well as political independence. Events adjacent to the Great Falls in Paterson, New Jersey were the basis for a significant early chapter in our national industrial history.

The first real step in America's industrial revolution, however, took place in another former colony – Rhode Island. Samuel Slater, born in 1768 in the County of Derbyshire, England, arrived in New York in 1789. Slater had apprenticed in England under Jedediah Strutt, a partner of English textile

manufacturing's noted technology pioneer, Richard Arkwright. Despite the embargo on emigrating skilled workers, Slater managed to sail to the United States under false pretenses. Immediately upon arrival, he gained employment in a small textile mill in New York City. He soon learned of manufacturing attempts in Pawtucket, Rhode Island by Moses Brown, a Quaker merchant. Brown had established a textile mill with machines of the type invented by Richard Arkwright in England.

Brown and his partners found that operations with the machinery were flawed and sought someone more experienced in textile machines to lead the enterprise. Slater came to Pawtucket, rebuilt part of the equipment, and convinced Brown to replace it and start anew. Two years later, the mill was so successful that a new water-powered mill was designed and established for the purpose of manufacturing textiles in 1792. Now known as "Old Slater Mill," it is a nationally significant resource of the John H. Chafee Blackstone River Valley National Heritage Corridor. It was designated a NHL in 1966. Soon after Slater's success, similar manufacturing efforts would take hold and grow throughout New England. Alexander Hamilton, the nation's newly appointed first Secretary of the Treasury followed these events closely.



Slater Mill, Pawtucket, Providence County, RI, west and north elevations. Note single-story addition extending to side of trench. Drawing c. 1869. Credit cc. HAER ri,4-pawt,3-47. Library of Congress.



Slater Mill, Pawtucket, Providence County, RI. Interior first floor from east corner, looking northwest. HAER er ri,4-pawt,3-24. Library of Congress.

Alexander Hamilton and the Society for Establishing Useful Manufactures

In the same lengthy 1781 letter to Robert Morris cited previously, Alexander Hamilton had argued that an attack on English credit could be a surrogate attack on England's military, resulting in a withdrawal of the financial support underwriting its ventures—particularly since English citizens were already heavily taxed and could not alone support the military. Hamilton laid out other economic reforms necessary for ensuring not only victory over the English, but the advancement of a multitude of American socio-economic interests. Key to these reforms was the establishment of a national bank, and the



Alexander Hamilton by Charles Willson Peale, from life, c. 1790-1795. Oil on canvas. National Park Service. Independence NHP. http://www.cr.nps.gov/museum/exhibits/revwar/image_gal/indeimg/hamilton.html

restoration of national credit. Morris, who had just received approval from Congress for establishing the Bank of North America, responded favorably to Hamilton, establishing common grounds for an early friendship. This letter was Hamilton's entrance upon the stage of American economic development. Alexander Hamilton is arguably the architect of the American economic system, as well as a leading proponent of a unified central government. His background is somewhat obscure. Born in the British West Indies (believed to be Nevis), he is thought to have arrived in New York City circa 1772 or 1773. He entered Kings College but did not graduate due to the outbreak of the Revolutionary War. He became fully engaged in the conflict when he was appointed a captain of artillery. In 1777, he rose to prominence while serving as a key aide to General George Washington.

Hamilton came to know New Jersey well during his war experiences, having participated in the November 1776 retreat from New York and across the Delaware River into Pennsylvania, the battles of Trenton and Princeton, the Morristown encampments and the Battle of Monmouth. Following his military service, Hamilton was a representative to the Continental Congress and vocally advocated for reform of the ineffective Articles of Confederation and the convening of a constitutional convention. Hamilton's thinking was always national in scope. He wrote many of the *Federalist Papers* justifying the Constitution. As the nation's first Secretary of the Treasury, he authored numerous reports that were instrumental in shaping the financial and economic future of the United States such as the *Report on Public Credit*, *Report on a Plan for the Further Support of Public Credit*, *Report*

on the Bank, Report on Establishing the Mint, and the Report on Manufactures.

Of particular importance to this Special Resource Study is the December 1791 *Report on Manufactures*. Hamilton set forth multiple arguments in the report on the importance of stimulating American manufacturing. In contrast to the beliefs of Thomas Jefferson and others regarding the need to maintain an agrarian society, Hamilton argued that agriculture does not fully employ the workforce available, that industry would help to attract immigrant workers to the fledgling nation, and that the diversification of the economy would greatly strengthen the nation's ability to survive and prosper. He also advocated the use of women and child labor and protective tariffs.

Scholars have long offered the proposition that Treasury's assistant secretary, Tench Coxe, participated in the drafting of the report. Coxe was a noted advocate of manufactures and active in a Pennsylvania society for this purpose before his appointment. The report, unlike Hamilton's many others, was not received favorably by Congress, largely due to opposition from then Secretary of State Thomas Jefferson, James Madison and the Republican Party. Many prominent citizens, too, were skeptical of the fledgling nation's ability to raise capital and begin manufacturing at a sizable scale. The report contained an interesting note that:

It may be announced, that a society is forming with a capital which is expected to be extended to at least a million dollars, on behalf of which measures are already in train for prosecuting on a large scale, the making and printing of cotton goods.



Tench Coxe. www.findagrave.com/

Shortly before issuing the report, Hamilton had joined in supporting Coxe's plan for a manufacturing society operated by private interests enjoying the support of government. A prospectus for the Society for Establishing Useful Manufactures (S.U.M) was drawn up, most likely a collaborative effort by Hamilton and Coxe, and published on April 29, 1791. (Chernow, p.372).

The prospectus expounded on Hamilton's arguments for manufacturing more finished products by corporations, even using public subsidy if necessary. It called for the establishment of an entire town supported by private investments and devoted to the Society's manufactures producing a multitude of different products from linens to paper to beer. While no specific site was mentioned, Hamilton viewed New Jersey as the logical place for the venture due to its proximity to financial interests in New York and Philadelphia, an available labor force and abundant water power.

The S.U.M convened in New Brunswick for its first meeting in August 1791. Directors were



Wm. Duer. Library Division: Humanities and Social Sciences Library / Print Collection, Miriam and Ira D. Wallach Division of Art, Prints and Photographs. New York Public Library Digital Gallery. Digital ID: 421710

selected and included William Duer as governor, as well as John Dewhurst, Elias Boudinot, Alexander Macomb, Royal Flint, Benjamin Walker, Nicolas Low, John Bayard, John Nelson, Archibald Mercer, Thomas Lowring, George Lewis, and More Furmans. Seven were from New York and six from New Jersey. Most were financiers and the board lacked experienced membership in actual manufacturing.

William Duer, the S.U.M. governor had been an assistant to Hamilton at Treasury prior to Coxe and was a prominent businessman of the time. Duer was raised and educated in England and moved to New York as a young man in 1768. He was known for a friendly disposition and eloquence that aided in his

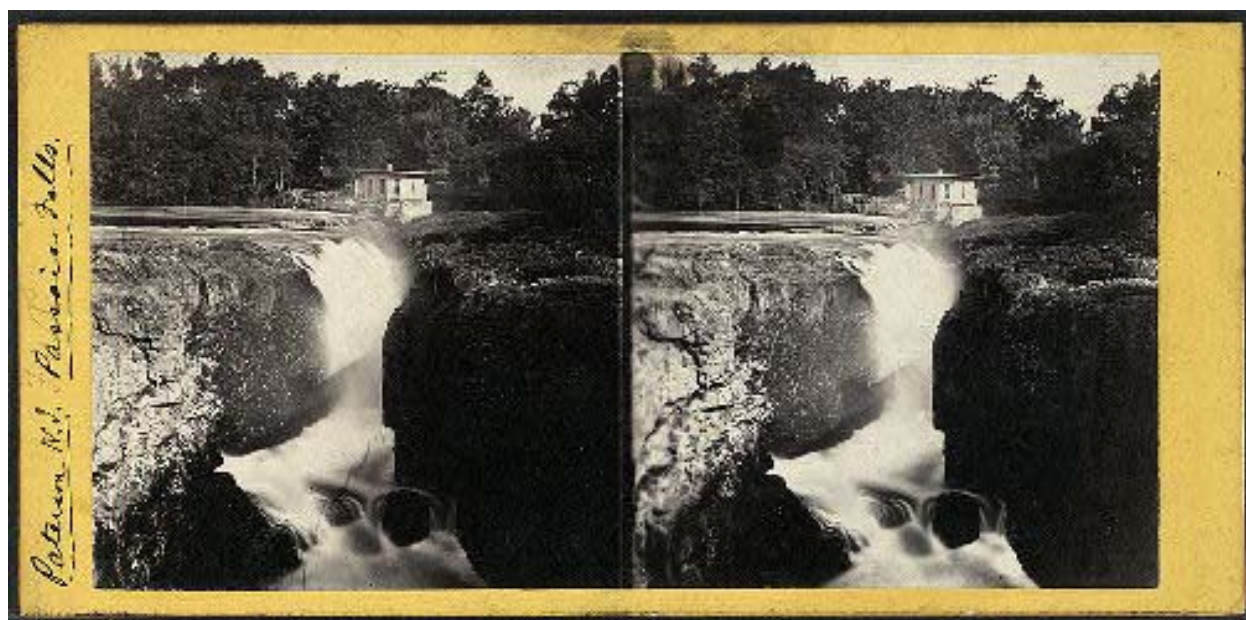
successes. During the Revolutionary War, he served as a deputy adjutant general for the New York troops and also on the New York “Committee of Correspondence.” He became a delegate from New York to the Continental Congress, and was later appointed to the Board of War. He was particularly known to be prone to speculative ventures and a key figure in the corrupt Scioto Corporation, an infamous group of land speculators in Ohio from 1789-1792.

The name of the new manufacturing town, decided upon before the site was selected, was to be “Paterson” after William Paterson, New Jersey’s governor. With Paterson’s support, the Assembly and Council of New Jersey quickly awarded the S.U.M a liberal charter conveying exceptional powers.

With the signing of the charter by Governor Paterson in November 1791, New Jersey agreed to be the location of what many observe as the most ambitious commercial undertaking of that era. Hamilton is believed to have been heavily involved in drafting the charter. The charter gave enormous power to the S.U.M., including exemption from local taxes and the right to improve rivers, build canals and charge tolls. Article III of the charter provided,

...that the said corporation shall not deal, nor trade, except in such articles as itself shall manufacture, and the materials thereof, and in such articles as shall be really and truly received in payment and exchange therefore.

This was envisioned as no mere business or holding company enterprise, but one that manufactured the products and gathered the resulting profits at a scale previously unknown in the new nation.



Stereoscopic views of Passaic Falls and Paterson, New Jersey. Robert Dennis Collection of Stereoscopic Views, Photography Collection, Miriam & Ira D. Wallach Division of Art, Prints & Photographs, The New York Public Library.

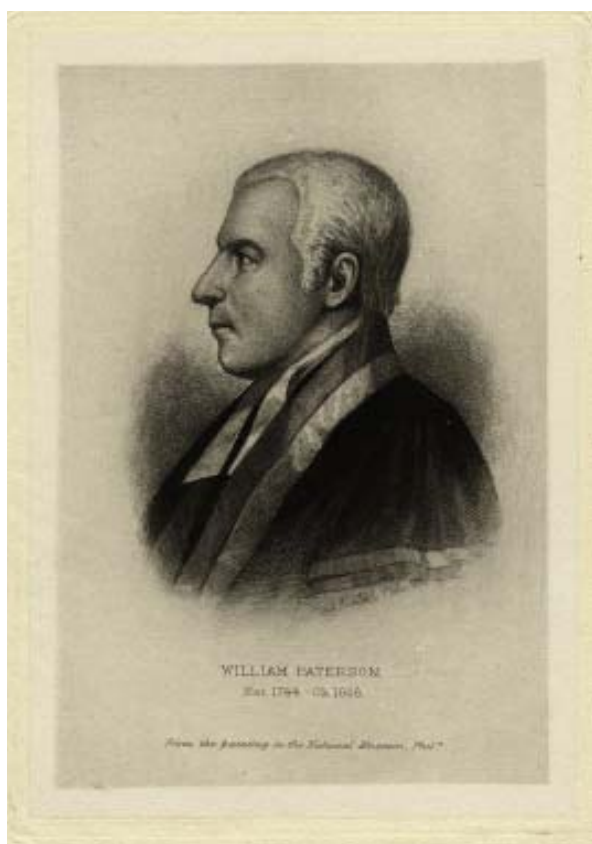
Paterson's Beginning

The name of the industrial settlement was already decided upon, but a location had yet to be selected. Hamilton employed a number of persons to seek out the most advantageous location. A letter from William Hall to Hamilton dated September 1791 made the following finding:

*"Sir/
Last night Mr. Mort & myself returned from the Passaic Falls- one of the finest situations in the world (we believe) can be made there – The quality of the water is good and in sufficient quantity to supply works of almost any extent, every thing necessary as to situation is here to be found... The situation so far exceeds our expectations that We are very desirous you should see it..."*

The site was the land adjacent to the Great Falls of the Passaic, a place Hamilton had visited briefly while serving as an aide to George Washington during the Revolutionary War. The site seemed particularly well suited for the start of an industrial city due to the abundant availability of water-power, timber from nearby forests, mineral ore in the surrounding mountains, and proximity to the markets of Philadelphia and especially New York City. In May 1792, the S.U.M. convened with Hamilton present to officially authorize the purchase of 700 acres of land adjacent to the falls and dispatched a group of directors to purchase the land.

The area around Great Falls was initially inhabited by the Lenni Lenape and colonized by the Dutch in the 17th century. In 1684,



William Paterson. Library Division: Humanities and Social Sciences Library / Print Collection, Miriam and Ira D. Wallach Division of Art, Prints and Photographs. In: Emmet Collection of Manuscripts, etc. Relating to American History. The Members of the Continental Congress, 1774-1789. New Jersey delegates. (created 1808-1890). New York Public Library Digital Gallery. Digital ID: 420187

fourteen Dutch families split the land into 100-acre lots all facing the Passaic River, with the remainder of land remaining common property. In 1714 a second major division occurred, known as the Boght Patent because of its lay within a bend in the river. Many of these division lines from the Boght are reflected in Paterson's eventual street plan. Plots were then divided vertically, creating strip farms similar to those in New England at the time. While small-scale operations like grist mills sprouted in the rural landscape, the area remained quite pastoral until Hamilton and

the S.U.M. selected the site for the industrial City of Paterson. (Renner, p.2) The S.U.M. bought land above and below the falls to ensure complete control over its water power potential.

The first priority for the S.U.M. was putting into place the infrastructure necessary to provide water power for the vast enterprise. The original plan to construct canals from above the falls and emptying into the river below proved too costly. The S.U.M. embarked on a short-term program to construct a cotton spinning mill, a weaving operation, an establishment for printing calicoes, a sawmill, and housing for workers. (Renner, p.5)

The motives of Hamilton and those of Duer and his associates were different; Duer being driven by speculation and Hamilton additionally interested in demonstrating the value of industry in the growth of the nation. The S.U.M directors were also more narrowly focused, reflecting the smaller-scale operations in which they had experience.

Hamilton's biographer, Broadus Mitchell, notes that:

"The directors were merchants and promoters rather than industrialists. They were used to individual ventures, or to joint action with a friend or two, in brief projects, the outcome of which could be fairly calculated. The SUM was intended to be not only permanent, but expanding, and embraced such varied problems as power development, construction of machinery and plant, recruitment of skill, technological operation, purchase of materials and sales of products, town planning, lease of mill sites, and

attraction and housing of settlers.” (Mitchell, p.185)

Another problem that the Society faced was the lack of technology and skilled workers. Hamilton and the directors agreed that the best way to get manufacturing underway was to actively seek out skilled English workers to come to Paterson and build the same modern equipment being used in Britain. Despite the English laws of the day and his post as Secretary of the Treasury, Hamilton, along with his assistant Tench Coxe, seemed to have few qualms about pursuing intellectual espionage as a means to ensure success. The goal was simply to get manufacturing up and running as soon as possible.

While pragmatism and a narrow industry orientation guided most of Paterson’s development, one fascinating divergence is the appointment of Pierre L’Enfant, the temperamental and extravagant engineer who worked on plans for the nation’s new capital city. Despite friendly relations with Hamilton, L’Enfant proved to be a problematic choice. He was under the employ of the S.U.M. for little more than one year and repeated requests by the Society for his plans were left unanswered. His city plan for Paterson was never carried out, and any actual drawings are lost. He did, however, design water power raceways that would ultimately be modified for use in the City.

During this period, financial panic set back the young nation, particularly in New York, between 1792 and 1793. The panic was largely caused by the massive amount of speculation, much of it by William Duer, the governor of the S.U.M. The S.U.M. was affected significantly, because Duer and other

directors had taken or invested S.U.M. funds elsewhere. The effects were instant and a number of the original investors left. Hamilton expressed his concern to Duer in a May 23, 1792 letter containing advice about paying his debts:

“I hasten to express to you my thoughts, as your situation does not permit of delay. I am of opinion that those friends who have lent you their money or security from personal confidence in your honor, and without being interested in the operations in which you may have been engaged, ought to be taken care of absolutely, and preferably to all creditors. In the next place, public institutions ought to be secured. On this point the manufacturing society will claim peculiar regard. I am told the funds of that society have been drawn out of both banks; I trust they are not diverted. The public interest and my reputation are deeply concerned in the matter.

On May 25th, Hamilton took direct action on behalf of the S.U.M. by seeking a loan in its behalf from the Bank of New York. In his letter to William Seton, Hamilton goes so far as to suggest that the bank will be guaranteed that no loss will occur.

My Dear Sir:

The society for the establishing of useful manufactures, at their last meeting resolved to borrow a sum of five thousand dollars upon a pledge of deferred stock. Mr. Walker is empowered to negotiate the loan, and I expect application will be made to the Bank of New York for it. I have a strong wish that the directors of that bank may be disposed to give facilities to this institution upon terms of perfect safety to itself. I will add that from its situation it is much the interest of our city that it should succeed. It is not difficult to discern the advantage of being the

immediate market of a considerable manufacturing town. A pledge of public stock will completely fulfil the idea of perfect security. I will add more, that in my opinion banks ought to afford accommodation in such cases upon easy terms of interest. I think five per cent. ought to suffice, for a direct public good is presented. And institutions of this kind, within reasonable limits, ought to consider it as a principal object to promote beneficial public purposes.

To you, my dear sir, I will not scruple to say in confidence that the Bank of New York shall suffer no diminution of its pecuniary facilities from any accommodation it may afford to the society in question. I feel my reputation much concerned in its welfare.

I would not wish any formal communication of this letter to the directors, but you may make known my wishes to such of them as you may judge expedient.

Duer was ultimately thrown into debtors' prison in New York and other New York directors felt it necessary to attend to their own personal finances. Subscribers were now unwilling or unable to invest and the S.U.M. lost its early momentum. Duer would languish and die in prison. Hamilton, never fully forsaking the friend that placed his vision in peril, appealed to a creditor in a letter asking for understanding of Duer's unfortunate plight.

Financially crippled, the remaining directors of the S.U.M. turned to Hamilton for guidance. (Mitchell, p.192) He volunteered his leadership. Until a new superintendent was hired, Hamilton essentially (though unofficially) served as the manager of the Paterson site and as the de facto governor of the S.U.M. all at once.

Recovery and Reversal

The task of immediate recovery was enormous. Despite the obstacles, Hamilton continued to be dedicated to his grand manufacturing experiment. He attended meetings of the board and visited Paterson despite a bout with yellow fever. The directors finally found a replacement and hired Peter Colt, a Connecticut shipping merchant, as superintendent.

Colt, though untrained as an engineer, was brought in to be the superintendent of the S.U.M. in 1793. L'Enfant did not bow to his supervision, and eventually left the site with all of his plans later that year. Colt proceeded, as best as he was able, to continue construction of the industrial buildings as finances would allow. The first, a small frame cotton mill was constructed, but powered by an ox and known as the "Bull Mill." (Shriner, p. 62) A canal was completed in January 1794, and water power became available later that year. The second cotton mill, so long in the plans and constructed of stone and wood, opened in June 1794.

Despite Colt's improved management, the enterprise continued to decline. In 1796, at an emergency meeting, the S.U.M. ceased operations and dismissed the majority of directors from their duty only five years after the signing of the charter. Hamilton's envisioned manufacturing enterprise was to enter a lengthy period of land leasing and water power development enriching other aspiring industrialists. It would never live up to the charge of its far-reaching charter to deal and trade in its own manufactures.

As Ron Chernow has concluded:

By early 1796, with Hamilton still on the board, the society abandoned its final lines of business, discontinued work at the factory, and put the cotton mill up for sale. Hamilton's fertile dream left behind only a set of derelict buildings by the river. At first, it looked as if the venture had completely backfired. During the next two years, not a single manufacturing society received a charter in the United States. Hamilton's faith in textile manufacturing in Paterson was eventually vindicated in the early 1800s as a 'raceway' system of canals powered textile mills and other forms of manufacturing, still visible today in the Great Falls Historic District. The City that Hamilton helped to found did achieve fame for extensive manufacturing operations, including foundries, textile mills, locomotive factories, and the Colt Gun works. Hamilton had chosen the wrong sponsors at the wrong time. (Chernow, pp. 386-387)

Another Hamilton biographer, Richard Brookhiser, notes somewhat more bluntly:

The Society for the Establishment of Useful Manufactures never recovered, and the 'Report on Manufactures' was a dead letter. (Brookhiser, p. 107)

As a real estate venture, rather than a manufacturing colossus, the S.U.M. was ultimately to prosper. In 1800 part of the cotton mill was being used. A few other manufacturers trickled in and rented out mill seats (the site upon which a mill is located), breathing a small bit of life into the all but abandoned site.

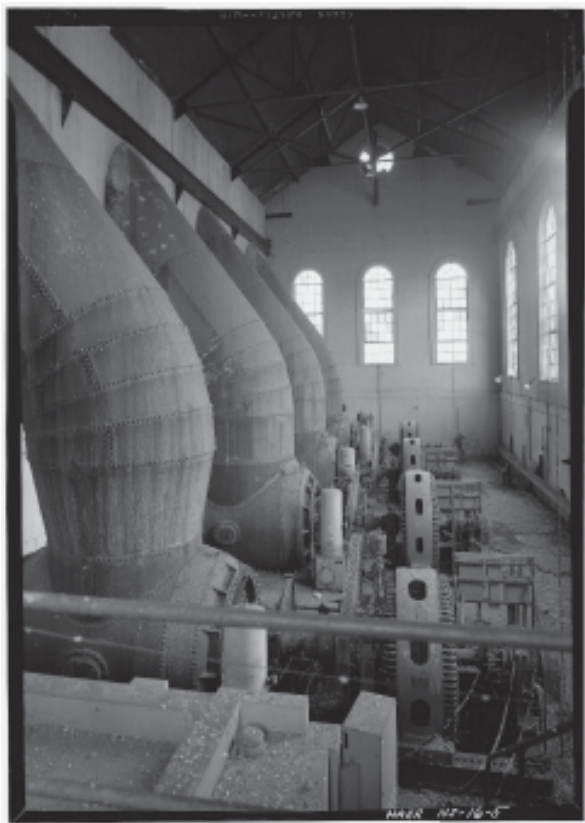
Despite a fire that destroyed the cotton mill, a new raceway was cut in 1807 paid for by

surplus income from the leasing of the mill seats. This was the first large investment made in Paterson in over 10 years, and the availability of additional power allowed for two more cotton mills to be built. Higher domestic demands for textiles came with the War of 1812 and the City began to grow and prosper. At the close of the war, the market became flooded with foreign goods and Paterson endured its second setback with mills idle and workers dismissed. The City weathered this new storm and began the process of renewal once more. This new capacity was partially enabled due to the completion of a second canal in 1829, greatly expanding the available water power.

A third crisis point for Paterson occurred in 1834 and 1837, when banks failed due to massive speculation. Industry, however, continued to pick up in diversified forms. Paterson's industrial future was about to be finally realized. It would not be the success of the S.U.M. as Hamilton envisioned it, but the realization of manufacturing diversity, and use of an immigrant work force would occur in



S.U.M. Hydroelectric Plant, McBride Avenue, Paterson, Passaic County, NJ. NPS photo.



S.U.M. Hydroelectric Plant, McBride Avenue, Paterson, Passaic County, NJ. Interior view of penstocks, turbines, and generators. HAER, Library of Congress.

Paterson and last into the next century. The same phenomenon would occur at the same time elsewhere in New Jersey and the nation.

Power for the Mills

A major reason for the Great Falls designation as a National Historic Landmark was the early harnessing of its water power resources. The following discussion of water power is largely drawn from the Historic American Engineering Record (HAER) Great Falls-SUM Survey, authored by Russell I. Fries.

Research has indicated that there were at least four stages of development of the Great Falls

Historic District water power system. The first, between 1792 and 1794 provided for the basic water supply system and a portion of the middle basin. Between 1800 and 1802, the system was extended and the middle canal was possibly enlarged. From 1806 to 1807, the lower raceway along Boudinot Street was added. Additions made between 1827 and 1846 were the most extensive and largely form the system as it exists today.

The first plan for diverting the waters of the Passaic for powering the mills of the S.U.M. were drawn up by Pierre C. L'Enfant, who was appointed in July, 1792. He began the design of a grand undertaking that would include a transportation canal over part of the watercourse and aqueduct. His plans included the construction of a reservoir to ensure a supply to the mills in periods of low river flow. The costly plans and L'Enfant's lack of desire to stay within the S.U.M.'s financial means resulted in his being replaced by Peter Colt.

Colt continued aspects of L'Enfant's work and in mid-January of 1794, a channel from the river and floodgates had been completed, as well as a dam. The canal was finished and placed into operation in June 1794 to power three or four mills.

In the first decade of the 1800s, business activity at the Great Falls began to improve and plans were made to extend the canal. Head and tail races (the latter being canals to rid the system of water once it had been used by the mills) were constructed west of Mill Street and are still extant. This improvement added about 500 feet of mill lots along the street and increased the depth and capacity of the middle raceway.



Water from the upper raceway flows through the Ivanhoe spillway. NPS photo.

In 1806-7 additional improvements were made to allow a second tier of mill sites using water at the elevation of the tail race from the middle canal as the head race for the new sites. These were located between the river and the present Van Houten Street. Water from the canal went through each lot and returned to the river via individual tail races. A spillway at the east end of Boudinot Street handled excess water. Each of the above two improvements had a head of 22 feet available.

The third expansion of the system, and the most elaborate and expensive, was the addition of a new upper tier of mill lots on the west side

of Spruce Street, completed in 1827. The addition required that the level of the whole system be raised almost to the base of the river to gain a further head of 22 feet for the new sites. The dam at the end of the ravine was raised and most likely enlarged. The deep gap was enlarged and partially filled to raise the water level, and after passing through, the water made an immediate right angle bend along the face of the ridge for almost 1,000 feet. The new canal was cut into the hillside with an embankment to hold the water. Water for the middle canal passed through the upper canal and the new tier of mill lots. This

required the tail race for the new upper group of mills to be higher than the old middle canal. Tail races on Spruce Street were raised on an embankment from 10 to 15 feet high. As mill lots developed, even these improvements became tested by 1850. The S.U. M. was forced to sell water rights to newcomers contingent upon an adequate supply to other mills. The only significant changes to the system after 1846 were the covering of several sections of the tail race on Mill and present day Market Streets. After 1850, many of Paterson's new mills were located outside the Great Falls Historic District and used steam as a power source instead of turbines powered by water.

Between 1912 and 1914, the S.U.M. opened another chapter by constructing a hydroelectric power generating station at the base of the Great Falls. A steam generating plant was also built for when the river was too low to run the electrical plant. Designed by the Thomas Edison Electric Company, the hydro-electric plant produced 4849 kilowatts and operated until 1969. The plant was purchased by the City of Paterson and restored to service in 1986 to produce almost 11,000 kilowatts per hour.

Major Industries, People and Events at the Great Falls

From the 1830s on, the area comprising today's Great Falls Historic District hummed with the sounds of railroad locomotive works and the textile trade. Paper-making, rope and hemp production settled into plants. Textiles of cotton, wool and silk, as well as arms were manufactured.

The Irish came in large numbers during and after their Great Famine of the 1840s and started anew as industrial laborers. Their rising populations caused those controlling political power to have concerns as the residents of the "Dublin" section of the City, near the Great Falls, struggled for increased representation. Skilled silk workers from England and Lyon, France, as well as Lodz, Poland arrived. Jews from Poland, Germany and Russia brought skills and traditions. Italian immigrants, and later African-Americans, joined the already diverse workforce. Labor unrest would ignite after the turn of the century, ironically in the City that was founded on Hamilton's proposition in his *Report on Manufactures* that women, children and immigrants were best suited to be the ones to produce the goods for a prosperous nation.

The City would continue to experience times of boom and bust as it progressed from the early days of the S.U.M. A fourth crisis occurred in 1857 when nearly every factory stopped and thousands lost their jobs. The last decade of the 19th century would be the pinnacle of industrial output in Paterson, and its status in silk production gained it the nickname "Silk City."

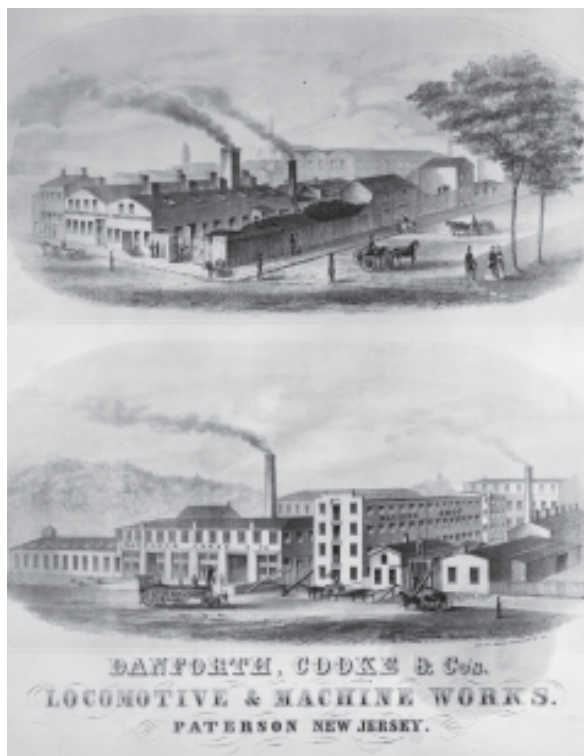
As the 19th century continued and the 20th century dawned and wore on through the Great Depression, Paterson's prosperity, like other industrial centers, continued to turn on and off. It ultimately followed the path of decline of most other older Northeastern industrial cities. The post World War II decline would still most of the factories at the same time that increasing numbers of African-Americans flowed in from the segregated South, seeking their own very late-arriving opportunities for economic advancement. The

opportunities were in a state of decline. Immigrants from other places search for the same opportunities in Paterson today. Unlike during its industrial peak, however, the mill sites adjacent to the Great Falls are mostly quiet with even fewer economic opportunities to offer. Its great heritage and associated important stories of our nation's industrial past, however, live on.

Locomotive Manufacturing

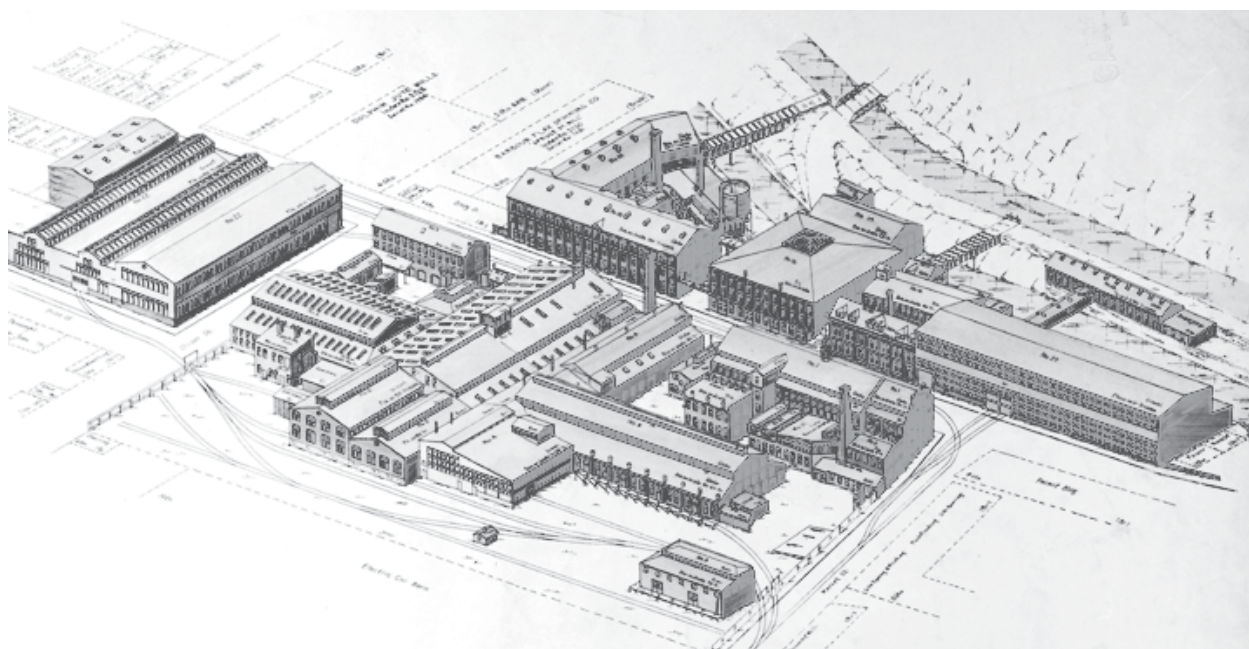
Thomas Rogers was born in Groton, Connecticut in 1792. He moved to Paterson in 1812. Having been trained in carpentry and as a blacksmith in Connecticut, he formed businesses in Paterson designing and building machinery for textile manufacturing. In 1832, he teamed up with two New York City financiers, Morris Ketchum and Jasper Grosvenor, to form the manufacturing firm of Rogers, Ketchum and Grosvenor. The company diversified, making among other items small parts for the newly developing railroad industry.

The production of railroad locomotives and rails in the United States followed earlier developments in England. Colonel John Stevens of Hoboken, New Jersey constructed a steam wagon in his yard in 1825. In 1829 Peter Cooper of New York built the *Tom Thumb* and it was placed into service on the newly constructed Baltimore and Ohio Railroad. In 1830 the West Point Foundry produced the first fully American built steam engine, *Best Friend*, to conduct scheduled passenger service on the Charleston and Hamburg Railroad. In 1831 the *De Witt Clinton* reached 25 miles per hour on the Mohawk and Hudson Railroad.



Danforth Locomotive & Machine Company, Market Street, Paterson, Passaic County, NJ. Photocopy of an engraving—ca, 1850-1859. HAER, Library of Congress.

Matthias W. Baldwin of Philadelphia made drawings of the Stephenson and Co. locomotive *John Bull* that was being stored in Bordentown, New Jersey prior to being assembled to run on Colonel John Stevens' Camden and Amboy Railroad. In 1832 Baldwin produced his first locomotive, *Old Ironsides*, which was used on the Philadelphia, Germantown and Norristown Railroad and stayed in service for 20 years. His locomotive works were ultimately to become the largest in the United States, producing over 70,500 locomotives when it ceased operations in 1956.



Rogers Locomotive & Machine Works, Spruce & Market Streets, Paterson, Passaic County, NJ. Photocopy of Associated Mutual Fire Insurance Map-1906. HAER, Library of Congress.

In 1835, Rogers, Ketchum and Grosvenor assembled its first locomotive for the Paterson and Hudson River Railroad, one that had actually been built by the same British manufacturer, Robert Stephenson and Company. In 1837 Rogers designed and built the *Sandusky* which contained his own design innovations. The *Sandusky* was placed in service in Ohio.

As Rogers' reputation grew in producing locomotives of endurance and increasing power, more orders arrived and the firm established itself in an important position in the industry. It also spawned other producers from within its own ranks. Rogers' shop foreman, William Swinburne, left to form his own locomotive works in partnership with Samuel Smith in 1845. Swinburne and Smith and Company went under a decade later in the 1857 financial panic. It soon afterwards was to

be reorganized and purchased by the New York and Erie Railroad as a maintenance shop.

Another employee, John Cooke, formed Danforth, Cooke and Company in Paterson in 1852. This firm later changed to Cooke and Company, and was ultimately purchased by the American Locomotive Company shortly after the turn of the century. It produced close to 3,000 units before closing in 1926. During the late 19th century, Paterson was establishing itself as a major center for locomotive manufacturing in the country. The Grant Locomotive Company was also located in the City.

Perhaps the most popularly known locomotive produced by Rogers was that bearing the serial number 631. Built in late 1855, the locomotive was purchased by the Western and Atlantic Railroad. Christened *The General*, the

locomotive would become famous during the Civil War for an attempt by Union cavalry to hijack the Confederate train it was powering. The event was popularized in the 1962 movie, *"The Great Chase."* The locomotive *The General* is preserved today at the Southern Museum of Civil War and Locomotive History in Kennesaw, Georgia.

Thomas Rogers died in 1856 and his son Jacob S. Rogers took the helm and reorganized the firm into Rogers Locomotive and Machine works. The company maintained its competitive position in the industry and prospered.

A Rogers locomotive (Union Pacific #119), built in 1868, was present at the driving of the "Golden Spike" marking the completion of the first transcontinental railroad on May 10, 1869 at Promontory, Utah, although that was not the original plan of the event sponsors. Mishaps and weather events affecting other locomotives left #119 as the next in line to participate. Although scrapped in 1903, a replica of the locomotive is located at the Golden Spike National Historic Site, a unit of the national park system.

In the early 1890s Jacob S. Rogers resigned the presidency, but remained an investor, and the company was reorganized under its former treasurer, Robert S. Hughes, as the Rogers Locomotive Company. Hughes died in 1900 and the works were closed in 1901 by Rogers, who died later that year. Rogers left much of his fortune and a legacy of many valuable works of art to the Metropolitan Museum of Art in New York City.

Reorganized once more, the plant reopened briefly, but could not compete with a newer

conglomerate, the American Locomotive Company (ALCO) or its older rival, and the consistently leading U.S. manufacturer, the Baldwin Locomotive Works of Philadelphia. It was finally absorbed into ALCO before the end of the decade, joining its neighbor, the Cooke Locomotive and Machine Works. ALCO continued making locomotives at the Rogers' plant for a few more years when major locomotive production and an important era in Paterson's history came to an end.

Today, the Paterson Museum occupies the former Rogers' erecting shop and offers interpretive exhibits and programs of the City's industrial past. The New Jersey Community Development Corporation occupies the former Rogers locomotive frame fitting shop and the former administration building which had since been converted to a textile factory. Both buildings comprise the Senator Frank R. Lautenberg Transportation Opportunity Center and Independence House.

Samuel Colt and the Gun Mill

Samuel Colt was born in Hartford, Connecticut in 1814, the son of a textiles manufacturer. As a teenager, he went to sea and legend persists that he conceived of his invention on a voyage and carved a wooden model of the revolving breach cylinder on the ship. He later had models made of the cylinder and secured an English patent in 1835 and one in America in 1836.

In 1836, he established the Patent Arms Manufacturing Company in Paterson. Colt was unsuccessful in attracting contracts with the government. The company was forced to



Samuel Colt, 1814-1862. This image is in the public domain because its copyright has expired.

close in 1842 after producing approximately 5,000 guns.

Samuel Colt was to later to make his fortune when he returned to his home state Connecticut. Awarded a government contract for revolvers to be used by U.S. troops in the Mexican American War, Colt urgently needed manufacturing space. He temporarily found space at Eli Whitney's factory and then established Colt's Patent Fire Arms Manufacturing Company in Hartford in 1848. Completed in 1855, Colt made it one the most advanced interchangeable parts factories in the nation. The Colt facility in Hartford, named "Coltsville," included the factory and workers housing and continued its production through

World Wars I and II. The Colt Company still exists, but is no longer located at the Hartford site. His guns became popular among individuals on the western frontier, primarily after the factory moved to Hartford.

After his untimely death in 1862, Colt's wife Elizabeth took over the direction of the Hartford company for close to 39 years. Their nearby home, Armsmead, is a NHL. An NHL nomination for several Colt Company factory buildings and workers' housing has been submitted for formal consideration by the Landmarks Committee of the National Park System Advisory Board.

The remaining Patent Arms Manufacturing Company resources at the Great Falls have significantly less integrity than those in Hartford. The Colt mill in Paterson was a multi-storied structure built near the Great Falls. A weather vane in the shape of a gun sat atop a bell tower. As the Colt operation



Gun Mill ruins, Paterson, NJ. NPS Photo.



The Paterson Colts, Paterson Museum, Paterson, NJ. NPS Photo.

wound down, the building was used for other manufactures including early silk production. Later, the upper floors were removed. In 1983, the building was subjected to the arson caused fires of the Allied Textile Printing (ATP) site of which it is an integral part. Only the walls of the first two stories remain today.

John Holland and the Submarine

John Phillip Holland was born in 1841 on the west coast of Ireland not far from the Cliffs of Moher in Liscannor, County Clare. He joined the Irish Christian Brothers and became a teacher. He was particularly interested in science and the development of the flying machine and the submarine, completing his earliest design for the latter in 1869. He declined to take his perpetual vows into the Christian Brothers in 1872.

Holland left Ireland for the United States in 1873 to join his previously relocated mother and brothers in Boston. He moved to Paterson and took a teaching position at St. John's Parochial School. Two years after his arrival in the U.S., he submitted a submarine design to the Navy Department, the first of a number the Department chose not to accept. With financing from the Irish Fenian Brotherhood, a group committed to freeing Ireland from British control, John Holland built his first submarine in 1877. The Brotherhood was seeking a submarine that could be transported by ship and dropped off close to a British ship for the purpose of sinking it. It was constructed at the Albany City Iron Works in New York City. Designated *Holland I*, the craft was moved to the J. C. Todd and Company machine shop in Paterson for the installation of a petroleum



John Phillip Holland. This image is in the public domain because its copyright has expired.



The Holland I, Paterson Museum. NPS photo.

powered Brayton engine. The 14-foot long *Holland I* was launched in the Passaic River above the Great Falls in May and June 1878. Holland managed to take his submarine down to 12 feet for approximately one hour, but did not use the malfunctioning engine. Instead, he attached a flexible hose to an accompanying launch and powered the submarine by steam. Despite the malfunctioning engine, the Fenian Brotherhood was impressed with this initial performance and agreed to fund a larger vessel. Holland scuttled the hull of his first submarine into the Passaic River. It was discovered in 1927 and is currently on display at the Paterson Museum.

Holland's further submarine endeavors and his major contributions to the United States Navy as "The Father of the Modern Submarine"

took place outside of Paterson. The only structural resource connected with his Paterson launching is the remains of the J.C. Todd and Company machine shop which was mostly destroyed by a series of fires at the Allied Textile Printing Site beginning in 1983.

Holland's second Fenian Brotherhood financed submarine, the 31-foot *Fenian Ram* was constructed by the Delamater Iron Company in Manhattan and first launched into the Hudson River in 1881. The ensuing trials were successful and a number of descents were accomplished. Holland also test fired unarmed projectiles provided by John Ericsson, designer of the Civil War ironclad, the *Monitor*. Because of internal financial disputes, the Brotherhood stole the submarine in November 1883 under cover of night and towed it to New

Haven, Connecticut where it was stored and later abandoned in a lumber shed. In 1916, the submarine was taken to Madison Square Garden for a fund raising endeavor for victims of the Easter uprising in Dublin. It was then removed to what is now the New York State Maritime College at Fort Schuyler. In 1927 it was purchased and moved to West Side Park in Paterson and more recently to the Paterson Museum where it is currently on display.

John Ryle and “Silk City”

Paterson’s history is perhaps most readily identified by its label “Silk City.” It is one that is well deserved. During the late 19th and early 20th centuries Paterson’s silk mills supplied close to 50% of the country’s entire silk production and ranked second behind Connecticut in the production of spool silk in the United States. Well over 100 factories and mills were involved in all aspects of silk manufacturing and necessary support in the late 1880s, employing thousands of skilled and unskilled workers, mostly recent immigrants, in jobs such as weavers, dyers, throwers and twistors.

The first attempt at silk production in Paterson occurred in Samuel Colt’s gun factory in 1838. Christopher Colt attempted to weave silk on the fourth floor of the gun mill. It was quickly realized that the enterprise would be unprofitable and it was abandoned.

Christopher Colt sold his machinery to George Murray, who previously had owned a silk business. Murray brought in John Ryle, a knowledgeable person in the silk trade who came to America from the silk manufacturing center in Macclesfield, England. Ryle had



John Ryle's house. NPS photo.

initially taken a position as superintendent of a small mill in Northampton, Massachusetts, but was at the time working in New York City as a merchant for a silk factory in Macclesfield owned by his brothers.

Murray initially recruited Ryle to run his new venture from the Colt gun mill which he purchased in 1840. They became partners in 1843 and Ryle took over completely when Murray retired in a few years later. As the business flourished, Ryle bought the gun mill and constructed additional structures at the site. He later built his own mill, named after Murray which was lost to fire. The business went through ups and downs and almost floundered during the 1857 financial downturn. A new Murray mill was constructed in 1869. The business suffered hardships again in 1872, but Ryle emerged once more, reorganizing as John Ryle and Sons. This firm later became part of the Pioneer Silk Company.

During his tenure, Ryle became a major force in silk production, lobbying for relaxation of tariffs on imported raw materials. He was the first to produce silk thread on a spool,

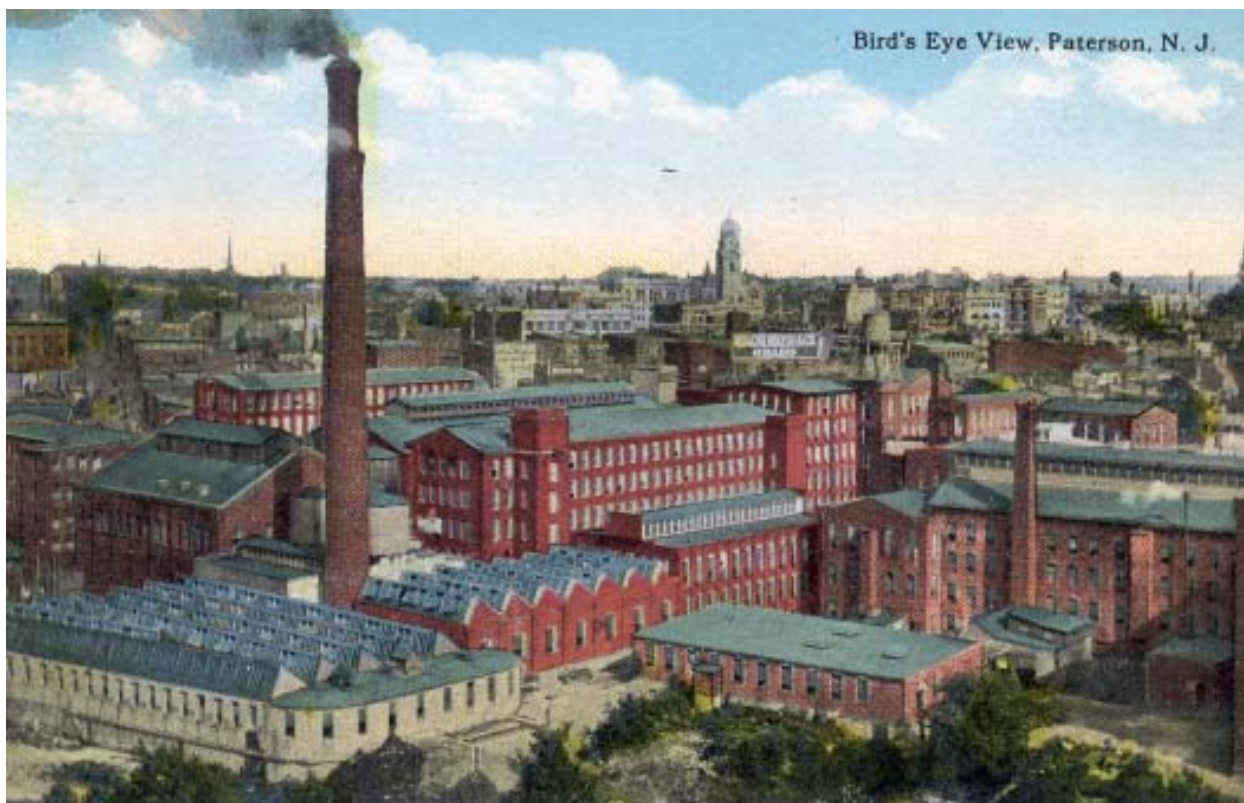


Lambert Castle. NPS photo.

responding to a request from Elias Howe, the manufacturer of sewing machines (Shriner, p. 81).

Two of his employees, Robert Hamil and James Booth would form their own successful firm of Hamil and Booth beginning in 1855. Other silk enterprises were established and prospered in Paterson both within and outside of the Great Falls Historic District well into the next century. Many were smaller operations that came and went using and reusing existing mills in the historic district for silk manufacturing and dyeing, or related work.

While many historic mill resources associated with the silk industry were significantly damaged in the ATP site fires, a number of mills periodically used for such manufactures remain. Among these are the Franklin Mill, Essex Mill, Congdon Mill, Harmony and Industry Mills which were operated by the Williams and Adams Company, and the



ATP Site, postcard. Paterson Museum.

Phoenix Mill, the oldest mill in the district. John Ryles' house, although moved slightly from its original site, is also located in the district, now converted to office use.

Above and outside the Great Falls Historic District on nearby Garrett Mountain is Belle Vista, often called "Lambert's Castle." It was built by Catholina Lambert in 1892. Lambert established the silk operations of Dexter, Lambert and Company on Straight Street in Paterson, outside the Great Falls Historic District, in 1866. He came from an impoverished background in England, his parents being mill laborers, and had served an

apprenticeship at an English cotton mill. Lambert rose to become one of the wealthiest of Paterson's "Silk Barons." The castle now serves as the headquarters of the Passaic County Historical Society.

The Silk Strike of 1913

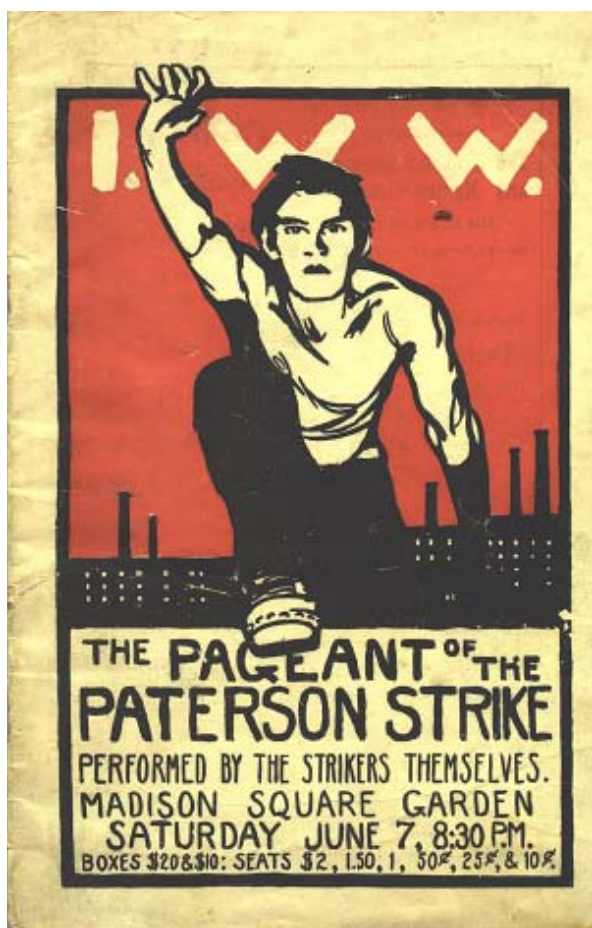
While the silk industry thrived and the "Barons" became wealthy, labor unrest was soon to affect the City. Initially, silk workers were recruited or arrived from Northern Europe; at the end of the 19th century many were from Eastern and Southern Europe. Difficult working conditions and the threat of new technological innovations in the mills resulted in labor unrest and union activities. Work interruptions became commonplace and many silk manufacturers began moving operations to locations with less labor conflict in Pennsylvania and elsewhere.

During the late 19th and early 20th century, conflict between labor and management was growing not only in Paterson, but throughout the country. Establishment of labor unions was on the rise and major labor actions were becoming more frequent. Strikes and events demonstrating continuing labor unrest included the Great Railroad Strike of 1877, the Haymarket Riot in Chicago in 1886, the Homestead "Lockout" in Pennsylvania in 1892, the Pullman strikes in Illinois in 1893 and 1894, the Anthracite Coal Strike in Pennsylvania in 1902, the New York Shirtwaist Strike of 1909, and the Lawrence Textile Strike in Massachusetts in 1912 to name just a few.

Paterson was not a stranger to labor actions, having been the scene of one of the nation's earliest actions, the 1835 strike by child



The Phoenix Mill. NPS photos.



I.W.W. Pageant of the Paterson Silk Strike. Lithograph by Robert Edmund Jones. American Labor Museum, Botto House National Landmark.

laborers in some 20 factories protesting 13½ hour working days. The strike wore on for six weeks and resulted in a partial win for the children. The settlement was reached for 12 hours of work on weekdays and 9 hours on Saturday.

The Paterson Silk Strike of 1913 included requests for increased wages and an 8 hour work day. It was primarily focused, however, on the impact of technology which permitted one worker to tend three or four looms instead of the usual two. Workers saw the new technology as a threat to their livelihoods. At

the Doherty Silk Mill, one of Paterson's largest, workers walked out on January 27, 1913 because of the installation of the newer machines throughout the factory. Workers in other mills soon joined the walk out. Ultimately, an estimated 24,000 workers were involved.

Paterson's mills had attracted the attention of the Industrial Workers of the World (IWW), commonly referred to as the "Wobblies." The union was fresh from its success in leading the Lawrence, Massachusetts "Bread and Roses" strike. Paterson mill owners responded harshly, bringing in outside strikebreakers. Paterson police also took strong actions against the striking workers.

The IWW brought in many prominent socialists and labor leaders including Elizabeth Gurley Flynn, Carlo Tresca, Bill Haywood, Emma Goldman, Margaret Sanger, Eugene Debs and Upton Sinclair. Forbidden to gather for meetings in Paterson, major rallies were held at the home of Maria and Pietro Botto in nearby Haledon. The Bottos were Italian immigrants who had worked in the Paterson mills. Their home, now a NHL commemorating its role in the strike, is the site of the American Labor Museum.

Living conditions for the striking workers became more difficult during the strike and the organizers provided for many children to be sent out of the city to stay with volunteering families predominately in New York City and Elizabeth. The IWW leaders also attracted the interest of intellectuals in New York City and plans were made for a great pageant at Madison Square Garden focusing on the Paterson strike as a vehicle to raise funds. On June 7, 1913 thousands attended the pageant

with silk workers portraying strike events and activities.

Mill owners continued to refuse to give in to striker demands and remained financially viable, in part by the fact that they could redirect manufacturing orders to their relocated mills in Pennsylvania. After 22 weeks, the solidarity among strikers began to show cracks as some and then more workers returned to the mills.

The strike ended along with the effectiveness of the IWW in the northeast. In 1919, after a series of smaller strikes, many silk workers in Paterson won the 8-hour workday.

Silk mills continued to prosper in Paterson during World War I. In time, many smaller concerns were bought up by larger companies such as the Standard Silk Dyeing Company and Allied Textile Printers. As technological advancements occurred in the development of synthetic fabrics including nylon and rayon, Paterson's role as "Silk City" came to a close.

Cotton, Flax, Paper, Hemp and Jute

Cotton was the product of the Great Falls Historic District's first mill, constructed by the S.U.M., and the later Phoenix Mill, constructed circa 1813. The original portion of the Phoenix Mill is the oldest currently standing mill in the district, now converted to housing. Mills in the district continued producing cotton fabrics and thread along with other products.

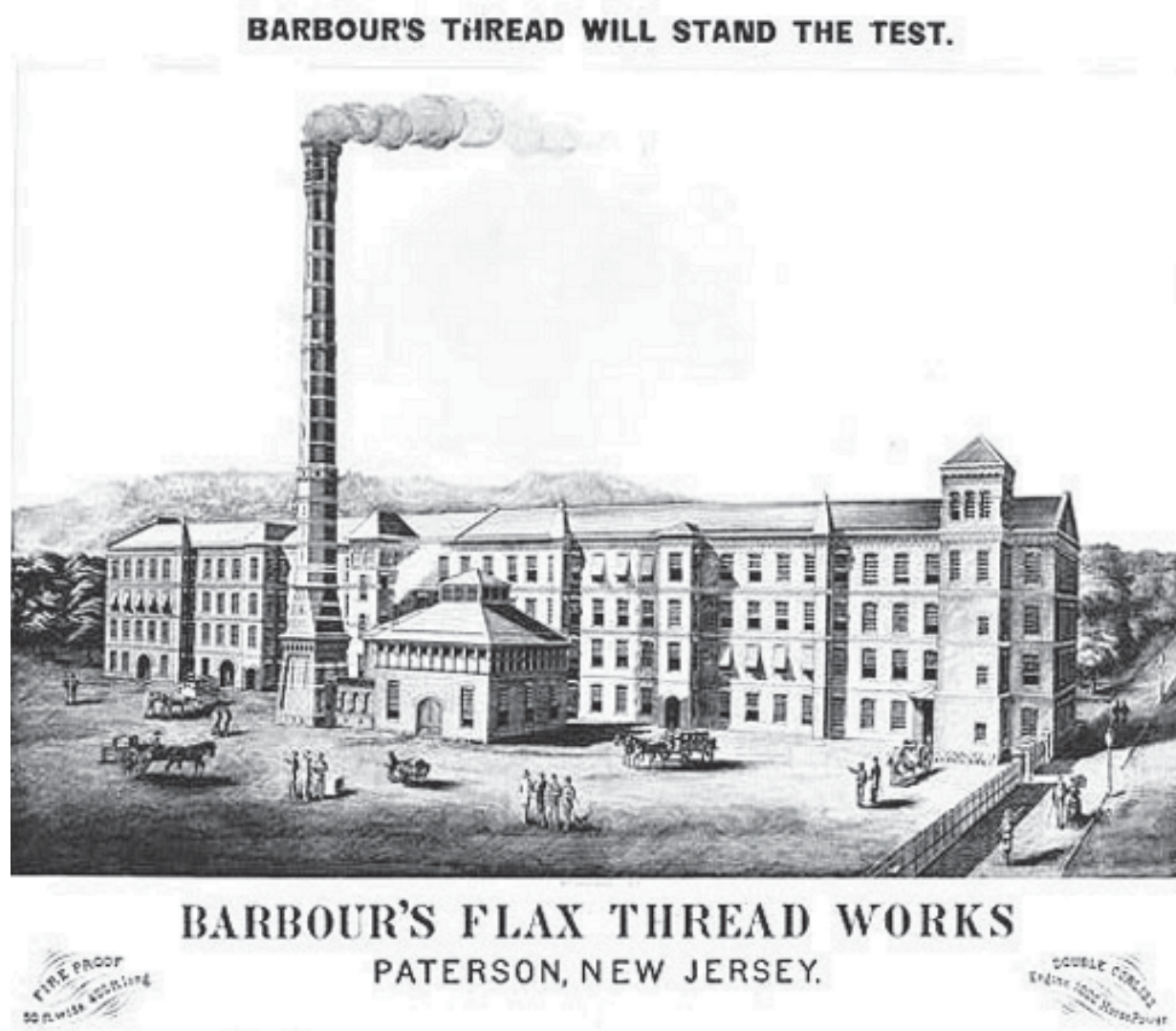
John Colt produced cotton duck and a durable sail cloth for vessels. The inability to obtain cotton during the Civil War meant many

northern textile mills closed or sought other raw materials.

One of the largest of the mills at Great Falls was the Barbour Flax Spinning Company. Thomas Barbour came to the United States from Lisburn, Ireland circa 1850 to establish an American branch of his family's Lisburn manufacturing interests—William Barbour and Sons. In 1852 he established a business concern at Exchange Place in New York dealing in threads and twines, including those of his family's Lisburn mill. In 1864 he moved to Paterson and began operations at the mill previously used by John Colt for the



Barbour Flax Spinning Company, Spruce Street Mill, Spruce & Barbour Streets, Paterson, Passaic County, NJ. East elevation. HAER NJ,16-pat,7-b-1. Library of Congress.



Photocopy of a Lithograph—ca. 1880-1889. Barbour's Flax Thread Works: Paterson, New Jersey (8x10 neg.) HAER NJ,16-PAT,7-A-1. Barbour Flax Spinning Company, Granite Mill, Spruce & Barbour Streets, Paterson, Passaic County, NJ. Library of Congress.

production of cotton duck. Barbour was to construct two more mills as the business grew.

Henry Butler, born in Connecticut and the son of a paper mill owner, came to Paterson in 1837 and began paper manufacturing in the Passaic Mill. In 1850 he constructed the Ivanhoe Mill and continued his paper making enterprise as the Ivanhoe Manufacturing

Company, making it one of the most popular brands in the nation. Although there were ten buildings associated with the Ivanhoe operations, only the wheelhouse structure remains today between the upper and middle S.U.M. constructed raceway.

The manufacture of rope, twine and carpet backing from hemp and jute was also a part of

Paterson's industrial past. The Dolphin Jute Company was one of the largest of these enterprises in the Great Falls Historic District. The Company occupied some of the Rogers Locomotive Works' buildings, along with the Paterson Silk Exchange, when Rogers ceased operations.

Mills at the Great Falls were used and reused by different manufacturers during the history of the area. The Phoenix Mill, and Colt Mill, as well as both Passaic mills, for example, were the sites of many different industries, as were others. Reuse of mills within the district continues today with public and private uses including housing, offices and the Paterson Museum in the places that once rang with the sounds of industrial production and labor. Paterson's present plans for the district are for continued adaptive reuse of the mills.

The Great Falls and its industries secured for Paterson a major portion of its rich industrial history. The district, however, was not the only location in the City for such uses. Major silk operations like Dexter and Lambert on Straight Street were located elsewhere. The

Wright Aeronautical Company which came to Paterson in 1919 to Lewis Street produced the engine that powered Charles Lindberg's *Spirit of St. Louis* across the Atlantic Ocean to France in 1927. Wright Aeronautical would become Curtiss-Wright Corporation in 1929 and the company would go on to produce engines and aircraft that helped win World War II. The corporation still exists, but no longer in Paterson.

A Final Note on the S.U.M.

The S.U.M. continued its operations for approximately 153 years after its establishment in 1792. While it did not fulfill the vision of its founders, it did prosper during its history from real estate and water power ventures. In 1945, the S.U.M.'s charter and remaining property were purchased by the City of Paterson, which now owns the preponderance of the Great Falls Historic District.



The Franklin Mill. NPS photos.





The Essex Mill. NPS photos.



Historic District Resources

The Great Falls Historic District basically comprises a collection of predominately 19th century mills (some with later additions), other structures and water power raceways along the Passaic River below the Great Falls. The mills no longer contain original equipment, although representative machinery for textile and locomotive manufacturing exist at the Paterson Museum, located in a building of the former Rogers Locomotive Works.

Probably the earliest construction material used for mills in the district was cut brownstone block set in a minimal mortar bed. Typically, brownstone block walls were at least 18 inches thick. Cut brownstone also comprises the majority of the retaining wall along the Passaic River. Brick appears to have replaced cut brownstone in the next generation of mills. Multi-wythe wall sections of three to five wythes of brick were interlaced with soldier courses for durability. Timber and wood framing was also used for construction. Generally the configuration included rough cut floor joists bearing on timber girders spanning

to 12 inch square wood columns. More modern 20th century structures or additions were constructed of steel and concrete (Maxman pp. D-49-D59).

A series of fires at the ATP site substantially damaged most of the 30 buildings there, including some of the district's most important historic resources. This site is among the properties now included within the boundaries of the newly designated state park. The remaining resources in the district outside of the ATP site largely retain a high degree of integrity and many have been adaptively reused for other purposes.

The ATP site lies within the heart of the historic district and consists of approximately 7 acres. It contains portions of the S.U.M. constructed raceways and the ruins of numerous historic mill structures. Among mills within the ATP site were some of the earliest in the district. It was here that the S.U.M. established a mill in 1794. Included, too, was the Colt Mill (1836) where Samuel Colt produced his first firearms and in the same building John Ryle brought silk textile



The Harmony Mill. NPS photo.



The Nightingale Mill. NPS photo.

manufacturing to Paterson. Additional buildings constructed by Ryle were also at the site. The Todd Mill (c. 1876), where the engine for John Holland's first submarine was fitted, was located here, along with the Waverly (1857) and Mallory (c. 1860) textile mills and the Passaic Mill complex.

Many of these resources were later consolidated under the ownership of larger manufacturing enterprises in the late 19th and early 20th centuries including, successively, the Knipscher and Maass Silk Dyeing Company, Standard Silk Dyeing Company, and Allied Textile Printing Company. The remainder of the Great Falls Historic District is comprised of buildings associated with the S.U.M., locomotive and textile manufacturing, and other manufacturing enterprises.

Buildings directly associated with the S.U.M. include the hydroelectric plant (1914), a field house (1914), remnants of the steam and boiler plant (1876), two gate houses (1846 and 1906), and the S.U.M. administration building (c. 1920). The upper (begun in 1847), middle (begun in 1792) and lower (1807) water power raceways, including head and tail races are

virtually all intact. The S.U.M. Passaic Street Bridge (1858) also remains.

Buildings associated with locomotive manufacturing include the Rogers Locomotive Works' administration building (1881), the erecting shop (1871), the frame fitting shop (1881), and the millwright shop (rebuilt in 1879 on the site of the Passaic Paper Mill (1832). In 1974 archeological excavations were conducted at the site of the former blacksmith shop.

Danforth and Cooke Locomotive Company resources include the the office building (1881), and the foundry (1831). The site of the Grant Locomotive Company erecting shop (c. 1850) was the subject of archeological excavations in 1974.

Buildings associated with textile and silk companies include the Barbour Flax Company complex including the flax mill (1860) and the Granite Mill (1881). Other textile manufacturing resources in the district include the Franklin Mill (c. 1870 with later addition), the Essex Mill (1871), the Congdon of Nightingale Mill (1915), the Phoenix Mill (the

oldest extant mill in the district with portions constructed in 1816 and additions c.1826), the Harmony Mill (1876), the Industry Mill (1875 and 1879), and the Addy Mill (1873-1880).

The Old Yellow Mill (originally built in 1803 and rebuilt in 1856) was an early paper rolling factory and joins the Ivanhoe Wheel house as the major remnants of paper manufacturing in the district. The Dolphin Jute Mill Complex (1844 and later addition) also remains.

Historic homes within the district include those of John Ryle (1830), Benjamin Thompson (1835) and John Colt (1850).

Other than the S.U.M.-constructed water power improvements, the extant resources of the Great Falls Historic District are typical of many northeastern cities that experienced industrialization in the 19th century.



Workers in the silk mills c. 1910. Paterson Museum.



42

*This Page
Blank*

Overview &