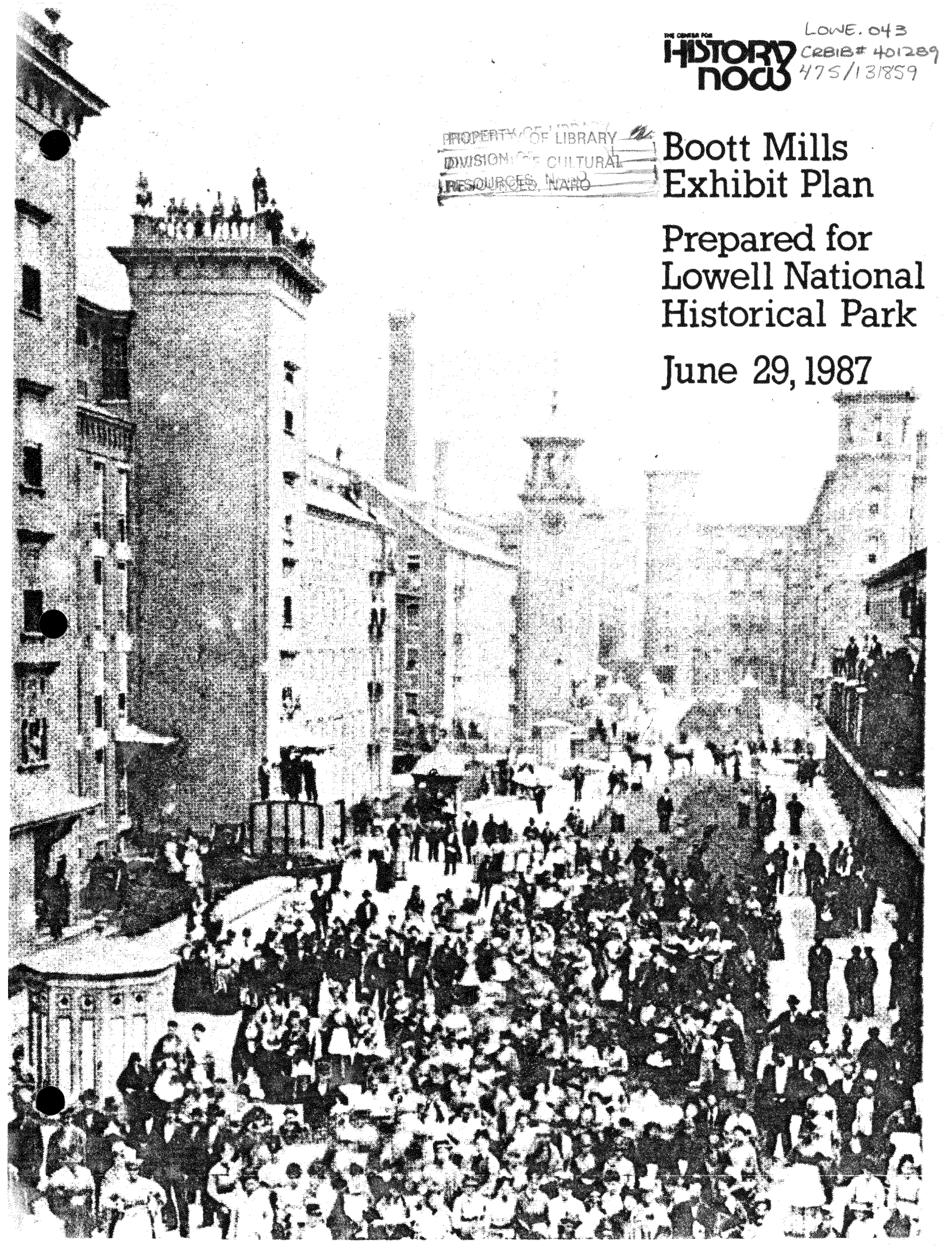


PROPERTY OF LIBRARY
DIVISION OF CULTURAL
RESOURCES, NHAHO

Boott Mills Exhibit Plan

Prepared for
Lowell National
Historical Park

June 29, 1987



LOWELL NATIONAL HISTORICAL PARK

EXHIBIT PLAN: BOOTT MILL

Shomer Zwelling
Managing Partner

Avi Decter
Jeff Kennedy
Diane Rodolitz

TABLE OF CONTENTS

Introduction	1
Thematic Overview and Walk Through	2
Explanation of Exhibit Component List.	8
Floorplan	9
Exhibit Contents:	
Section 1.0 Exterior Signage.	11
Section 1.1 Historic Stairway.	13
Section 1.2 Orientation	15
Section 1.3 Weave Room Orientation.	27
Section 1.4 Weave Room.	34
Section 2.1 Pre-Industrial America	44
Section 2.2 Hamilton-Jefferson Debate	57
Section 2.3 The Mill System.	60
Section 2.4 Mill Machinery	65
Section 2.5 Management	73
Section 2.6 Conflict.	83
Section 2.7 Fascination with Technology.	96
Section 2.8 Work Products	105
Section 2.9 Cut Through	110
Section 2.10 Decline	112
Section 2.11 Lowell Today	116
Section 2.12 Visions of the Future.	121

INTRODUCTION

The Boott Mills Exhibit Plan marks an important milestone in the exhibit planning and development process. It is the product of considerable research, many intensive meetings with diverse parties, the Conceptual Statement, and the exhibit model.

This report consists of five elements:

- 1) A schematic drawing of the floorplan
- 2) A thematic overview and exhibit walk-through
- 3) Main thematic text for major exhibit areas
- 4) Schematic treatments for media programs
- 5) A listing of objects, visuals, and reproductions as well as information on their current status

After review and acceptance of this plan, our efforts will be directed toward the preparation of technical documents, completion of scripting (for both labels and media programs), and the conclusion of object and photographic research.

We look forward to taking these steps together.

THEMATIC OVERVIEW AND WALK-THROUGH

Exhibits on the first and second floors of the Boott Mills will cover a wide range of historical and contemporary issues relating to work in a factory and the Industrial Revolution in America. By using quotations from workers and managers, oral histories, and dramatic scenes, the people of the Boott Mills will play a central role in the exhibit. Although machines, systems, and historical settings will have their place in the exhibit, the primary emphasis will be on human experience, motivation, and expectations.

Technically the visitors' experience will begin outside the factory, when they get off the trolley and see the Boott Mills before them. Here, near the canal, there will be an introductory sign, providing a brief biographical overview of the factory. Walking across the canal and through the Countinghouse Archway, historic graphics and text will encourage visitors to ask themselves, "What was it like to go to work here?"

Inside the Mill Courtyard a wayside exhibit with text, quotations, and period graphics will point out significant features of the area (the Clock Tower and the Countinghouse, for example) and describe the changing look of the Courtyard over time. A photograph of workers in the Courtyard would be suggestive. Finally, the sign will direct visitors to the factory/museum entrance which also would have been used by workers when the Boott Mills was still operating.

Inside the Boott, the formal exhibit will consist of two parts. On the first floor visitors will walk through an operating weave room exhibit with machines furnished from the early part of the twentieth century. The weave room will provide visitors with a baseline experience, giving them a sense of what happened in a cotton textile mill. This direct experience will also set the stage for the second floor interpretive exhibits which will address such subtle and complex issues as the ways in which the various historical players viewed their work and changes in Lowell factory life over the course of the nineteenth and twentieth centuries.

Upon entering the Boott from the millyard visitors will see the historic stairway which will evoke the early twentieth century years. On the walls regulations will be posted. A modern sign will direct visitors to the Ranger Orientation area.

The reception room--with a ranger and information desk--will include four small introductory exhibits: views of the Boott Mills exterior over time; views of Lowell over time; famous visitors to Lowell; and a model of the mill district with insurance maps and illustrations of various Lowell textile complexes during the heyday of the city. This space will also serve as a gathering area for groups. Signs and the ranger will invite visitors into the Weave Room Orientation Area.

This room will be a relatively quiet space with a large window looking into the operating factory floor. The area will permit visitors and groups with a ranger to assimilate the impact of the many looms, belts, pulleys, beams, carts, and general activity of the weave room. In this viewing area, there will be photographs of weave rooms over time as well as some equipment--timetables, I.D. tags, handtools, machine parts, beams, and regulations--modestly arranged.

Visitors will enter the Weave Room exhibit on the canal side of the building. About half way through the room the path will turn toward the center of the room and when it reaches that point it will resume its way toward the rear arches. On the railing separating visitors from the operating machines will be quotations from the people who worked in the mill at various points in time--"mill girls" from the early period, European immigrants from the turn of the century, Colombians from recent years. Near the rear of the weave room exhibit area there will be a loom fixer's bench with appropriate tools.

Visitors will reach the second floor by taking a modern stairway which will include some design elements from the historic Boott. Slowly, they will take leave of the historical environment and enter a modern museum

interpretive gallery area. At the entryway to the second floor exhibits there will be a large rear lit transparency of an early nineteenth century rural New England landscape. Implicitly visitors will be invited to contemplate American life before the advent of the Industrial Revolution.

The initial exhibit area on the second floor will bring together the key components which made the Lowell experiment possible. Using East Chelmsford as an example, one zone will deal with life in rural New England during the early part of the nineteenth century. Here exhibits will focus on farm work and tools, making clothes by hand, early power mills, and the nature of the farm labor force. Nearby there will be a small exhibit describing the Southern plantation system: the emergence of cotton as a "miracle crop," the discovery of the cotton gin, the organization of the Southern (slave) labor system, and the connection of Southern planters with Northern industrialists. A third component will be concerned with the Boston Associates: their roots in Newburyport and Boston, their experiences in international trade, their family connections, their economic situation in the Early Republic, and the ways in which they gained special privileges from the United States Government. A fourth and final section will note Lowell's predecessors: in Europe, Rhode Island, New Jersey, and especially Waltham, Massachusetts. In this area there will also be a model of the first factory established by the Boston Associates in Waltham.

In a hallway outside a theater visitors will see a large wall-exhibit on the Jefferson-Hamilton debate over the future of American society. With text, large-sized portraits, and first person quotations visitors will learn that Americans were not of one mind in their thinking about the new industrial order.

In the nearby theater, visitors will see a relatively short multi-image slide program which will describe both the Vision and the Reality of Lowell. This show will act as a culmination for the pre-Lowell section of the exhibit and launch visitors into the next exhibit area which will focus on working in the mills. The show will deal with hopes, expectations,

ideals, and pre-conditions as well as the real, concrete problems of operating and laboring in a huge, complex textile factory during the nineteenth century. This program will also anticipate the concluding audio-visual program.

From this slide show, visitors will enter a large central exhibit area which will be concerned with Lowell factories during the mature years of the textile industry in this city. Exhibits in this area will have a rough chronological progression, beginning in the first part of the nineteenth century and ending at the turn of the century.

The first exhibit component will be a large-scale animated model of the Boott Mill in 1836, when it began operating. Here visitors will learn about the integrated mill system, scale of operations, the bale-to-bolt process, the variety of jobs in the factory, and the relationship of this mill to its predecessor in Waltham. Nearby a series of textile machines will be displayed. Chosen for their interpretive significance, they will be used to address a variety of subjects including American inventiveness, everyday experiences, live demonstrations, a strike, and the making of machines for textile factories. Videotaped oral histories as well as quotations and photographs of laborers at their work stations will convey to visitors the experiences of diverse people in the mill.

Interspersed along the way will be stations dealing with significant labor-management conflicts in the history of Lowell: the "Mill Girl" Strikes during the golden era, the Mule Spinner's Strike of 1875, and the I.W.W. Strike of 1912. A concluding interactive video-program will give visitors an opportunity to consider the diverse interests--labor, management, ownership--which came into conflict during the 1912 Strike. On a smaller scale, there will be a variety of dispersed interpretive moment stations in this large exhibit area. Placed in a chronological sequence, they will be concerned with the role of government and significant events in the history of the Boott.

The views, concerns and responsibilities of management will be addressed

in a unified exhibit zone. Using portraits, biographical sketches, reports, charts of organization, and a cut-away of a section of an overseer's office, the exhibit will delve into management issues: the separation of management from ownership, promotions, social mobility, and techniques for controlling the labor force.

Exhibits on the canal side wall will show the various kinds of goods made by Boott Mill workers over time, the markets to which these diverse goods were shipped, and the ways in which these markets as well as other textile centers shaped the product-lines of the Lowell factories. Where appropriate, views of the mill at various times will be integrated into this section.

On the wall along the millyard an interpretive exhibit will depict the American fascination with technology and belief in progress. Featuring Lowell textile inventions as well as machines and tools developed for farms and homes this exhibit will provide a context for the Lowell phenomenon. The pervasiveness of the Industrial Revolution will be a central theme here. Similarly, visitors will also become aware of the nineteenth century dream of technological utopianism and the efforts of various managers and industrialists to dominate the workforce by employing "scientific" methods.

The central area will conclude with the cut through to the first floor where visitors will look down onto the operating weave room again. The experience will set the operating weave room floor in the context of the beginning of the decline. Quotations from consultants' reports, graphics, and information will discuss the state of the industry in Lowell at the turn of the century. In this way, visitors will be cued to the decline of the textile industry in Lowell.

From the Central Exhibit Area visitors will walk into a darkened warehouse room with a few dispersed crates or boxes, dirty walls, and marked floors. Here visitors will learn about the decline of the Lowell

mills during the first half of the twentieth century. An audio-visual program using oral histories will relate the ways in which diverse people and interests--workers, owners, managers--coped with the changing economic situation.

The final exhibit area--separated into two parts--will be concerned with contemporary issues and their relationship to past experiences. In one room visitors will learn about the revitalization of Lowell. With text, objects, and graphics, visitors will discover the ways in which the public and private sectors recovered a vision and revitalized Lowell. Major themes will include the availability of technological knowledge and the coming of the high tech industry; contemporary workplaces and the re-use of old mills; grassroots culture and the development historical awareness; goods and products as well as the modern labor force. In this section visitors will learn that Lowell's rebirth is the outgrowth of conscious efforts by capitalists, planners, developers, and workers as well as local, state, and federal agencies.

In the last exhibit area visitors will have an opportunity to contemplate the shape of the future. A profusion of micro-electronic consumer goods will indicate that we are still very much entranced by technology. Nearby an early throstle twister juxtaposed with photographs of a modern automated textile mill will demonstrate the ways in which contemporary owners and managers seek to reduce the role of labor in the industry. Finally a state-of-the-art multi-image video program on a bank of screens will present a range of impressions--from science fiction movies, high tech advertisements, experiments of researchers in artificial intelligence to man-in-the street interviews--on the choices before the American people today. Visitors, in conclusion, will be encouraged to think about today's promise in light of the experiences of the past.

EXPLANATION OF EXHIBIT COMPONENT LIST

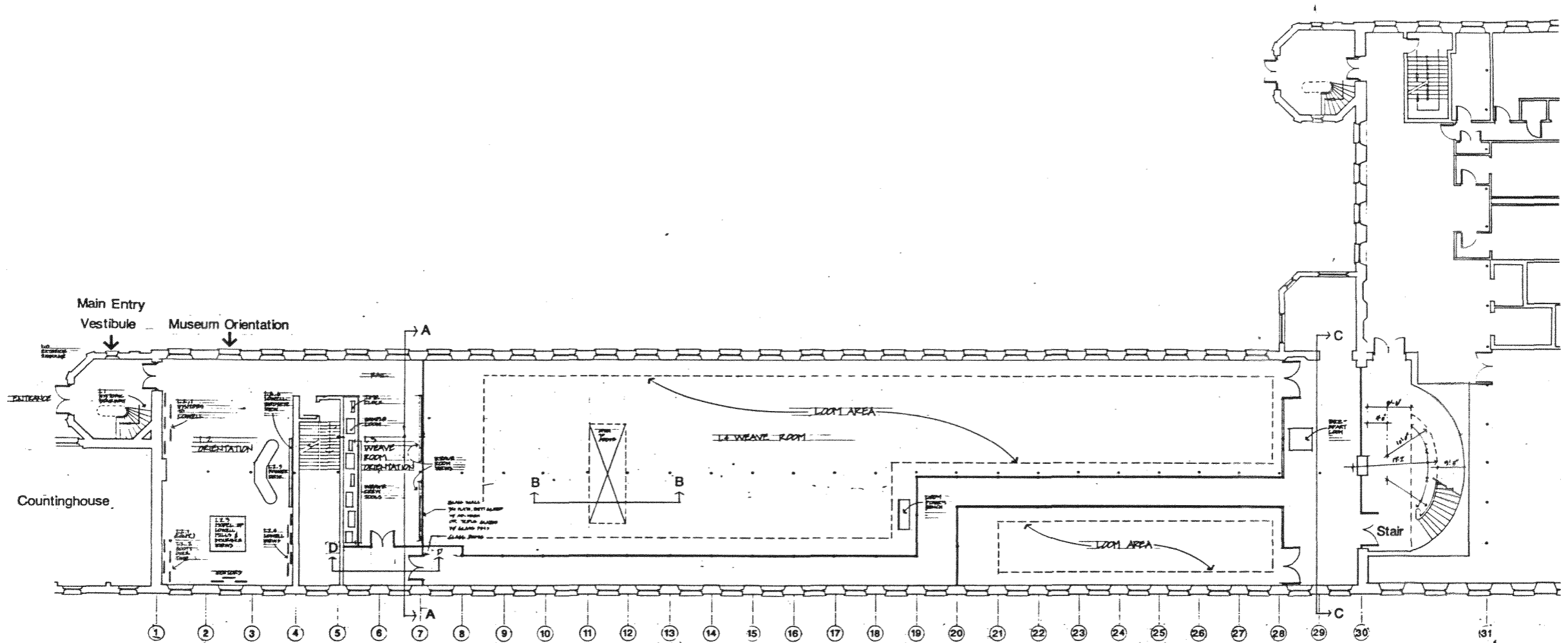
A list of artifacts, visuals, reproductions, media programs, and other interpretive devices is provided for each exhibit section. When a particular artifact or reproduction prototype is referred to, its Project Identification Number (PIN) is included. If there are several items to choose from, the PIN for each item is listed.

Because of the number of photographs in the exhibit, the sources for each individual photograph were not listed with the exhibit components. The following is a list of all the photographic sources for the exhibit:

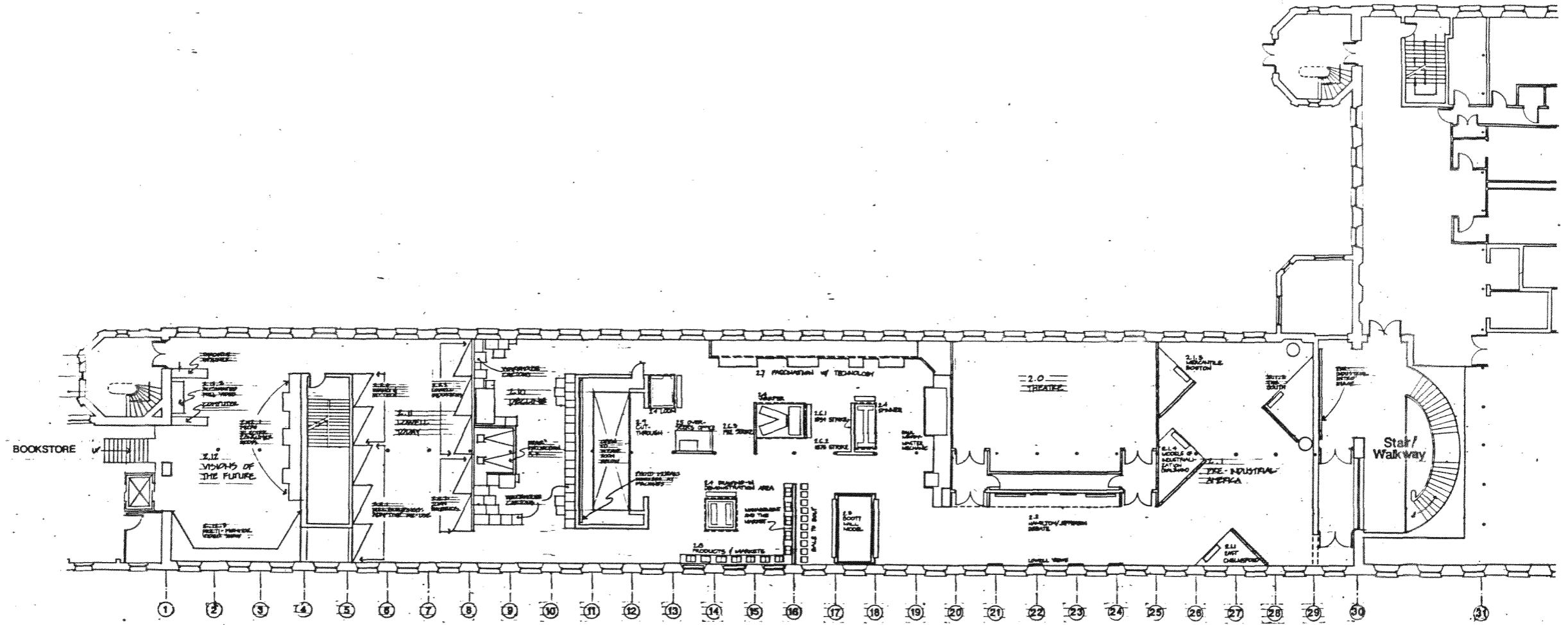
- Baker Library, Harvard University
- Library of Congress
- Locks & Canals
- Lowell Historical Society
- Lowell Museum
- Lowell National Historical Park
- Museum of American Textile History
- Private Collections
- University of Lowell

Abbreviations used in the plan:

AAS	=	American Antiquarian Society
BA	=	Boston Athenaeum
BLHU	=	Baker Library, Harvard University
BPL	=	Boston Public Library
L&C	=	Locks and Canals
LHS	=	Lowell Historical Society
LM	=	Lowell Museum
LNHP	=	Lowell National Historical Park
MATH	=	Museum of American Textile History
NMAH	=	National Museum of American History
NYPL	=	New York Public Library
PML	=	Pollard Memorial Library



The Center for History Now, Jeff Kennedy Associates	Boott Mills Building No. 6 Lowell National Historic Park Lowell, Massachusetts
1 of 7	Drawing Title: Building Development: Exhibit Plan First Floor Scale: 1/8" = 1'-0" Date: 3/15/87



The Center for History Now, Jeff Kennedy Associates.	Boott Mills Building No. 6 Lowell National Historic Park Lowell, Massachusetts
	Drawing Title: Exhibit Plan Second Floor Scale: 1/8" = 1'-0" Date: 6/27/87

SECTION 1.0: EXTERIOR SIGNAGE

List of Exhibit Components 12

AREA 1.0: EXTERIOR SIGNAGE

EXHIBIT COMPONENTS

[NOT WITHIN SCOPE OF HISTORY NOW CONTRACT]

1. Graphic of mill complex
To be made
2. Photograph of mill workers in millyard (Lowell)
[See PINs - 270, 271, 1462, 1904, 2305]
3. Photograph of Boott millyard, ca. 1870s-90s
[See PINs - 64, 71, 72]
4. Photograph of Boott Countinghouse and Mill #6, ca. 1871-82
[See PIN - 1020]
5. Illustration of mill workers going to work
Reproduction (BA; MATH)
[See PINs - 380, 381]
6. Sign: Don't drink canal water
Reproduction (LHS)
PIN - 377
7. Sign: Don't jump mill fence
Reproduction (BLHU)
PIN - 690

SECTION I.I: HISTORIC STAIRWAY

List of Exhibit Components 14

AREA 1.1: HISTORIC STAIRWELL

EXHIBIT COMPONENTS

1. Sign pointing to the ranger's desk
To be made
2. Sign for office
Reproduction
3. Storage boxes
Reproduction
4. Regulations
Reproduction

SECTION 1.2: ORIENTATION

Thematic Labels 16

List of Exhibit Components 22

THE BOOTT COTTON MILLS

The Boott Cotton Mills was incorporated in 1835, and it began producing cotton cloth a year later. When constructed the mill complex consisted of four large, separate buildings. It contained 29,248 spindles and 830 weaving machines or looms. The corporation employed 950 female workers and 120 men. During an average week in 1840, the Boott produced 155,000 yards of cloth.

Over the course of the nineteenth century the Boott grew steadily with new buildings constructed, additional looms and spindles installed, machinery improved, power systems changed, more workers hired, and cloth production increased. This building--Boott Mills No. 6--was constructed over a two year period, 1871-1872.

By 1904 the Boott factory complex consisted of nine buildings. It contained 153,412 spindles and 3,706 looms. The corporation employed 790 female workers, and 850 men. During an average week in 1904 the Boott manufactured 450,000 yards of cloth.

A host of problems, however, plagued the corporation. Confronted by aggressive Southern competition, an outmoded physical plant, and recurrent conflicts between workers and managers, the owners decided to close down the Boott in 1954. At the time the corporation employed _____ people.

Since then the mill complex has served a variety of industrial functions. It has been a warehouse, a shoe factory, a toy-making plant, a printing shop, and a computer assembly plant.

The Park Service chose Boott Mills as the site for exhibits not because its history was unique, but because the Boott was a typical Lowell textile mill. With structures dating from the mid-1830s, the Boott complex is itself a prized artifact demonstrating the evolution of the textile industry in New England: from its earliest years of hope, through its decades of maturity, until its time of decline.

This restored mill building as well as the operating weave room and the historical exhibits stand as a monument to all the people who earned their living making cloth.

LOWELL VISITORS

Prominent people have been coming to Lowell for over 150 years. During the early part of the nineteenth century politicians, writers, celebrities, and foreign dignitaries came here to observe the much acclaimed Lowell experiment in action.

Charles Dickens, Davy Crockett, Andrew Jackson, and Henry David Thoreau visited Lowell to see for themselves the emergence of a new industrial system. Although their attitudes toward the mills and the new industrial order differed, all agreed that Lowell was the site of revolutionary changes.

By the early twentieth century Lowell had lost much of its promise, but famous people continued to come. Theodore Roosevelt, Henry Ford, Thomas Alva Edison, Charles Lindbergh, and John F. Kennedy all visited the city. For some Lowell was only a brief stop in a quest for votes and headlines. For others it was a place of by-gone glories, crushed dreams, and enduring struggles.

Modern-day visitors to Lowell are part of this long tradition. Here you can witness the promise and the realities of the Industrial Revolution. Here too you can assess both the causes and the consequences of broadbased industrialization. Finally, you can rediscover the ways in which choices made by one generation shape everyday realities for many succeeding generations.

LOWELL: VISION AND REALITY

Lowell was one of America's earliest planned industrial cities. It was founded and funded by a group of wealthy Boston merchants during the 1820s. They intended to develop an industrial system which would not have any of the problems associated with English factory-life.

By employing New England farm women for only a few years and housing them in boardinghouses operated by the corporations, the Boston-based mill owners hoped to make their industrial city morally respectable and personally profitable. They also intended to promote public virtue while expanding the range of work choices available to Americans.

Initially Lowell was successful and grew rapidly. In 1850 the city included ten major textile corporations which employed over 11,000 workers and produced more than 2 million yards of cloth *per week*. The population jumped from 3,500 in 1828 to 35,000 in 1850.

Lowell's early success fostered immitators, and competition reduced profits. As owners became concerned with dwindling profit margins, both the city and the workforce suffered accordingly. Poor working conditions, strife between employees and managers, absentee ownership, and competition from nearby textile centers cast a shadow over Lowell's good fortune. Eventually, the New England farm women became disillusioned and left. They were replaced by waves of low-paid immigrant laborers searching for a foothold in America.

By the 1920s Lowell was a city in the throes of hard times. Many mills closed their doors, textile workers had difficulty finding jobs, and owners demonstrated little sense of responsibility for the city or its people. After World War II, Lowell seemed to be a community with a stirring past and a dismal future.

In recent years Lowell has been undergoing a rejuvenation. It has become a center for the high-tech industry. Unemployment is low, opportunities abundant, and the economy is expanding. Lowell is having a second-chance.

Many of its citizens hope that the experiences of the past will serve as a guide in charting the future.

LOWELL FACTORIES

Textile mills lay at the heart of Lowell. The community was often called the "Spindle City," and a stretch of mills along the Merrimack River was commonly referred to as the "Mile of Mills."

Initially powered by waterpower, Lowell's factories transformed cotton bales into bolts of cloth. Each individual textile corporation consisted of several buildings which contained many different kinds of machines: pickers, carding machines, spinning machines, looms.

Lowell's integrated system of manufacturing existed on a scale never before attempted in the United States. Its factories produced cheap, standard goods in large quantities. Lowell, in these ways, was a trailblazer in the development of American industry.

The first of Lowell's great textile factories--the Merrimack Manufacturing Corporation--began operations in 1823. Toward the end of the century, when Lowell was at its height, the city contained 175 mills with over 900,000 spindles. These mills employed more than 20,000 workers.

As a manufacturing site, the Lowell factories were a critical link in an international network which joined southern plantations, Boston merchants, New York fashion houses, transport facilities, and worldwide markets.

AREA 1.2: ORIENTATION

EXHIBIT COMPONENTS

AREA 1.2.1: FAMOUS VISITORS TO LOWELL

1. Portraits of famous visitors over time
Reproduction

To be selected from the following:

Andrew Jackson, 1827 and 1833 [See PIN-4250]
Martin Van Buren, 1833 [See PIN-4251]
Henry Clay, 1833 [See PIN-4268]
Davy Crockett, 1834 [See PIN-4267]
Harriet Martineau, 1835-36
Michel Chevalier, 1836 [See PIN-4253]
Ralph Waldo Emerson, ca. 1836
Daniel Webster, ca. 1820s-1840s?
William Lloyd Garrison, ca. 1830s? [See PINs-4254, 4255]

Charles Dickens, 1842 [See PIN-4258]
Frederick Douglass, 1843
John Tyler, 1843 [See PIN-4259]
James K. Polk, 1847 [See PIN-4238]
James Buchanan, 1847 [See PIN-4234]
Abraham Lincoln, 1848 [See PINs-4236, 4234]
Edgar Allan Poe, 1848

Franklin Pierce, ca. 1852? [See PIN-4233, 4232]

Henry David Thoreau, 1860 [See PIN-4229, 4228]
Prince Jerome Napoleon Bonaparte, 1861 [See PIN-4227]
General Philip Sheridan, 1861 [See PINs-4230, 4231]
Anthony Trollope, ca. 1862
Ulysses S. Grant, 1868 [See PIN-4206]
Vice-Admiral David Farragut, 1869 [See PIN-4265, 4266]

Grand Duke Alexis, 1871 [See PINs-4204, 4205]
Emperor Dom Pedro, 1876 [See PINs-4202, 4203]
Alexander Graham Bell, 1877 [See PIN-4207]

AREA 1.2: ORIENTATION

EXHIBIT COMPONENTS

Charles Parnell, 1880 [See PINs-4208, 4209]

William Jennings Bryan, 1896 [See PIN-4240]

Admiral George Dewey, 1899 [See PINs-4261, 4262]

Thomas Edison, 1905 [See PIN-4260]

Theodore Roosevelt, 1902, 1912 [See PINs-4211, 4212, 4214,
4215, 4216, 4217, 4218]

William Taft, 1912 [See PINs-4219, 4220]

Hellen Keller, 1913 [See PINs-4221, 4222]

Calvin Coolidge, 1922

General John Pershing, 1922 [See PIN-4224, 4225]

Rudolph Valentino, 1923

Edward, Prince of Wales, 1924

Henry Ford, 1930 [See PINs-4263, 4264]

Charles Lindbergh, 1930

Admiral Richard Bryd, 1931

Franklin Delano Roosevelt, 1932 [See PIN-4210]

Norman Thomas, 1932

Nelson Eddy, 1935

Harry Truman, 1952

Dwight D. Eisenhower, 1952

John F. Kennedy, ca. 1956

Charles, Prince of Wales, 1986

AREA 1.2.2: BOOTT EXTERIOR OVER TIME

1. Illustrations of the Boott Mills, 1830s - 1850s
Reproduction (U/Lowell, LHS, BLHU)
PINs - 40, 41, 42, 624, 628, 633, 4185

AREA 1.2: ORIENTATION

EXHIBIT COMPONENTS

2. Illustrations of the Boott Mills, 1860s - 1890s
Reproduction (LM, U/Lowell)
PINs - 43, 44, 71, 1017, 4130
3. Photographs of the Boott Mills, 1870s - 1890s
PINs - 65, 70, 852, 1018, 1019, 1022, 4178
4. Photographs of the Boott Mills, 1900s - 1930s
PINs - 63, 66, 67, 83, 90, 549, 551, 1023, 1025, 1464, 1903
5. Photographs of the Boott Mills, 1940s - 1980s
PINs - 74, 77, 84, 85, 1024, 4117
6. Additional views of the Boott Mills, not dated
PINs - 62, 849, 4111, 4180, 4181, 4184, 4194
7. Photographs of the "Mile of Mills," early 20th century
PINs - 262, 263, 2641
8. Additional Boott-related photographs
[See PINs - 268, 1389, 1390, 1392, 1394, 1461, 1908]

AREA 1.2.3: LOWELL AREA MILLS

1. Model showing all the mills in the Lowell area
To be made
2. Insurance map, Boott Mills
Reproduction
[See PINs - 20, 452, 4167]
3. Insurance map, Massachusetts Mills
Reproduction
[See PIN - 821, 4168]

AREA 1.2: ORIENTATION

EXHIBIT COMPONENTS

4. Insurance map, Appleton Manufacturing Co.
Reproduction
[See PIN - 4170]
5. Insurance map, Tremont Manufacturing Co.
Reproduction
[See PIN - 4166]
6. Insurance map, Merrimack Manufacturing Co.
Reproduction
[See PIN-4164]
7. Insurance map, Lawrence Manufacturing Co.
Reproduction
[See PIN - 4165]
8. Insurance map, Suffolk Manufacturing Co.
Reproduction
[See PIN - 4166]
9. Insurance map, Hamilton Manufacturing Co.
Reproduction
[See PIN - 4169]
10. Insurance map, Lowell Manufacturing Co.
Reproduction
[See PIN-4173]
11. Insurance map, Middlesex Manufacturing Co.
Reproduction
[See PIN - 4171]

AREA 1.2.4: VIEWS OF LOWELL

1. Illustrations of Lowell, 1820s - 1840s
Reproduction (LHS, PML, LNHP, Lowell Art Association, MATH)
[See PINs - 408, 632, 966, 1477, 2790, 3151, 4185]

AREA 1.2: ORIENTATION

EXHIBIT COMPONENTS

2. Illustrations of Lowell, 1850s - 1860s
Reproduction (LHS, BLHU, MATH)
[See PINs - 989, 3154, 3155, 3157, 3152, 3155, 4198]

3. Illustrations of Lowell, 1870s - 1880s
Reproduction (LM, LHS, Lowell Illustrated, Royal Ontario Museum)
[See PINs - 259, 412, 1587, 3159, 3160]

4. Illustrations of Lowell, 1890s - 1900s
Reproduction (Lowell of To Day)
[See PINs - 729, 864, 2673]

5. Illustrations of Lowell, n.d.
Reproduction (MATH)
[See PINs - 4187, 4197, 4199, 4200]

SECTION 1.3: WEAVE ROOM ORIENTATION

Thematic Labels 28

List of Exhibit Components 30

MANUFACTURING CLOTH

The invention of the power loom was a critical step in the emergence of the integrated textile mill. Previously weaving was performed on hand looms in the home. Before this process was mechanized, weavers worked as highly skilled craftsmen.

In a factory weave room, each worker tended several power looms. As the technology improved, the speed of the machines was increased and each worker was made responsible for additional looms. To minimize the level of skill required and to maximize profits, Lowell corporations produced cheap, standard cloth for a large market.

Weaving was only one of several steps in the textile factory. Initially the power looms were placed on the top floor of the factory in a system of vertically integrated production. Because the vibrations created by these looms threatened to collapse the entire building, looms were subsequently placed on the lower floors of the factory.

Weave rooms were hazardous work environments. Cotton dust caused lung and respiratory diseases. The noise was deafening. The lighting was poor. Heat and high humidity were debilitating. The hours were long, the work tedious, and the machinery and the belting dangerous. Life-threatening accidents and longterm health disabilities were common products of work in the textile factories.

THE WEAVE ROOM

Our weave room exhibit is based on extensive historical research to give the impression and experience of a Boott Mill work-setting during the first part of the twentieth century.

This room is not an exact recreation. The noise would have been louder and the humidity higher than the levels you will experience. There also would have been an additional row of looms on the floor.

Early in the twentieth century, the looms in the Boott were belt driven. After 1930, the belts were dismantled and individual motors installed. We have several electric motors running the line shafts on the ceiling to demonstrate an earlier form of power transmission.

The entire Boott complex had approximately 3,500 looms in 1910. During the first part of the twentieth century this room would have contained over 120 looms.

In all, there are 91 looms on our weave room floor. The looms were purchased from a mill in Tennessee. These looms have been reconditioned for use in our exhibit.

Because of the heat, humidity, noise, and vibration, you may find it uncomfortable to be in the weave room. Many workers had a similar experience. During the latter part of the nineteenth century they would have worked here for at least ten hours a day. Before 1872, the work day was twelve hours long.

If you do not want to walk through the weave room but wish to resume your tour of the Boott Mills on the second floor, the ranger in the Orientation Room will direct you. If you do walk through the weave room, ear plugs are available.

AREA 1.3: WEAWE ROOM ORIENTATION

EXHIBIT COMPONENTS

1. Loom
2. Weaver's hand tools: reed hook, weaver's hook, etc.
Original (LNHP, LM, Private Collection)
[See PINs - 1158, 1159, 2364]
3. Shuttles
Original (LM, LNHP)
[See PINs - 1639, 1181]
4. 1 or 2 bobbin carts
Original
5. Oil pumps
Original
6. Loom fixer's hand tools
Original
[See AREA 1.4 for list]
7. Time clock
Original (LNHP)
PIN - 2337
8. I.D. Tags
Original (LNHP, Private Collection)
PINs - 1754, 1777
9. Document: Hours of Employment for Women and Children
Original (LNHP)
PIN - 1836
10. Diploma for Completion of course in weaving
Original (LNHP)
PIN - 1921

AREA 1.3: WEAVE ROOM ORIENTATION

EXHIBIT COMPONENTS

11. Regulations, 19th century
Reproduction (LNHP, MATH, BLHU, U/Lowell, Mass Historical Society)
[See PINs - 461, 462, 691, 874, 876, 1748, 2584]
12. Timetables, 19th century
Reproduction (U/Lowell, BLHU, MATH)
[See PINs - 448, 449, 450, 451, 453, 454, 455, 456, 700, 701, 702, 703, 704, 765]
13. Pay stubs and envelopes
Original (LNHP)
PIN - 1597
14. Honorable discharge
Original (LNHP)
PIN - 2583
15. Union emblems
Original
16. Hour/Time rates
Reproduction
[See documents from the Flather Collection listed in Area 2.5, Management)
17. Piece rates
Reproduction
[See documents from the Flather Collection listed in Area 2.5, Management)
18. Weave room interiors and workers
 - a. Illustrations, 1840s - 1850s
Reproduction (NYPL, MATH, U/Lowell)
PINs - 379, 385, 403, 872

AREA 1.3: WEAVE ROOM ORIENTATION

EXHIBIT COMPONENTS

- b. Photographs, ca. 1850s - 1870s
PINs - 204, 213, 2149
 - c. Illustrations, ca 1870s
Reproduction (MATH)
PIN - 397
 - d. Photographs, ca. 1890s
PIN - 205
 - e. Photographs, ca. 1900 - 1910s
PINs - 183, 184, 206, 217, 358, 2251
 - f. Photographs, ca. 1915-1930
PIN - 1474
 - g. Additional photographs, not dated
PINs - 68, 1897, 2239, 2241, 2252
- 19. Photographic portraits of weavers
PINs - 226, 212, 210, 233
 - 20. Books used by workers
Original (LNHP, LM)
[See PINs - 875, 1834, 1979, 1980, 1981]
 - 21. Notice against smoking, 1852
Original (LNHP)
PIN - 1718
 - 22. Precautions against fire, 1835
Original (U/Lowell)
PIN - 376

AREA I.3: WEAVE ROOM ORIENTATION

EXHIBIT COMPONENTS

23. Boott product awards
Original (LM)
PINs - 4104, 4105, 4106

24. Safety Certificate
Original (LM)
PIN - 4107

SECTION 1.4: WEAVE ROOM

Selected Quotations 35

List of Exhibit Components 36

THE WEAVE ROOM

(Scripting in the Weave Room will consist of first-person quotations from Lowell mill workers over the course of the nineteenth and twentieth centuries. The quotations will focus on conditions and experiences in the mills.)

AREA 1.4: WEAVE ROOM

EXHIBIT COMPONENTS

1. Equipment [NOT WITHIN SCOPE OF HN CONTRACT]

- a. 91 looms, pick clocks and loom flags
Original (To be purchased)
(Flags from Franklinville)
- b. Lineshafting
Original (Appleton Mills?)
- c. Quiller (bobbin winder)
Original
- d. Inspection table
Original (Franklinville)
- e. Loom fixer's bench
Original (Appleton Mills)
- f. Bobbin stripper or cleaner
Original (Franklinville)
- g. Belt sander
Original
- h. Belt lacer
Original (To be purchased)
- i. Glue press and belt splitter
Original (LNHP)
PIN - 1121, 1122
- j. Oil pumps
Original (Appleton Mills)

AREA 1.4: WEAVE ROOM

EXHIBIT COMPONENTS

- k. Large oil barrels with pumps
Original (LNHP, LM)
[See PINs - 1119, 1147]
 - l. Small oil cans
(To be purchased)
[See PIN - 1135]
 - m. Lineshaft oiler
Original (Appleton Mills)
 - n. Sweeper
Original
 - o. Vise
Original
 - p. Drill press
Original
 - q. Knotter
Original (LNHP)
[See PIN - 1726]
 - r. Warp tying-in machine
Original (Franklinville)
2. Hand tools [NOT WITHIN SCOPE OF HN CONTRACT]
- **Tools to be purchased new for use by workers. May be supplemented by historical artifacts**
- a. Tool box
Original (LNHP, LM)
PINs - 806, 1635

AREA 1.4: WEAVE ROOM

EXHIBIT COMPONENTS

- b. Drills
- c. Wrenches
- d. Files
- e. Screwdrivers
- f. Hammers
- g. Calipers
- h. Needlenose pliers
- i. Cloths and brushes to clean looms
- j. Pickers
- k. Combs
- l. Reed hooks
Original (Private collection)
[See PIN - 2364]
- m. Scissors
- n. Drop wires
- o. Tool used to measure yardage
Original (LM)
PIN - 1153
- p. Other weaver's hand tools

AREA 1.4: WEAWE ROOM

EXHIBIT COMPONENTS

- q. Other loom fixer's hand tools
Original (LNHP)
[See PIN - 1741]

3. Miscellaneous Equipment [NOT WITHIN SCOPE OF HN CONTRACT]

**Items listed below either still exist in the weave room today or they would have to be recreated for effect

- a. Overhead steam pipes
- b. Auto sprinkler system
- c. Lights, with and without shades (carbon filament lights)
- d. Leftover gas lamps on walls
- e. Automatic fire doors
- f. Vertical pipes with hoses (fire equipment)
- g. Hygrometer (humidity)
(Franklinville)
- h. Drososphere (Atomizer)
(Franklinville)

4. Spare parts [NOT WITHIN SCOPE OF HN CONTRACT]

**To be purchased new for use

- a. Spare belts and lacing
- b. Barrel with picker sticks

AREA 1.4: WEAVE ROOM

EXHIBIT COMPONENTS

- c. Warp beams
(Franklinville or purchase)
 - d. Bobbins
 - e. Shuttles
 - f. Heddles
 - g. Filler yarn
 - h. Harnesses
 - i. Fur pieces
 - j. Reeds
 - k. Take-up rollers with woven fabric
 - l. Storage boxes
Original (LNHP)
[See PIN - 1600]
5. Miscellaneous Furnishings [NOT IN SCOPE OF HN CONTRACT]
- **Use historical artifacts or reproductions wherever possible
- a. Glue barrel
 - b. Waste cans
 - c. Warp beam racks
Original (Franklinville)

AREA 1.4: WEAVE ROOM

EXHIBIT COMPONENTS

- d. Warp trucks
Original (LNHP)
[See PIN - 2145]

- e. Bobbin carts
Original (Franklinville)

- f. Mill carts
Original (LNHP, LM)
[See PINs - 1601, 1607, 1608, 1612, 1613, 1614, 1615, 1636, 1637]

- g. Benches and chairs
Original (LNHP)
[See PIN - 1616]

- h. Desks, tables, and/or stands
Original (LNHP)
[See PINs - 801, 1602, 1603, 1604, 1605, 1609]

- i. Spittoons (cuspidors)

- j. Fire buckets and brushes

- k. Bubblers

- l. Reed cabinet
Original (LNHP)

- m. Lockers (1923) or cupboards, and pegs for clothing
Original (Appleton Mills?)

- n. Blackboard(s)

AREA 1.4: WEAVE ROOM

EXHIBIT COMPONENTS

6. Personal belongings
Original or Reproduction

a. Men's clothing:

aprons
overalls
coarse jackets
shoes
hats
street clothing

b. Women's clothing

aprons
shoes
hats
street clothing

c. Lunch pails
Original (LNHP, LHS)
[See PINs - 497, 2214]

d. Book: International Textile Worker's Handbook, 1923
Original (LM)
PIN - 1657

e. Calendars

f. Mirrors

g. Booklet: Non-fluid Oil
Original (LM)
PIN - 1670

AREA 1.4: WEAVE ROOM

EXHIBIT COMPONENTS

h. Book: Draper loom setting instructions
Original (LNHP)
PIN - 1834

i. Book: Loom fixer's manual
Original (LM)
PIN - 875

7. Signs

To be reproduced

a. Fire escape (and red light)
[See PIN - 1618]

b. No smoking (in English)

c. Time/piece rates

d. No spitting (in English)

e. Hospital/Workmen's Compensation law (in many languages)

SECTION 2.1: PRE-INDUSTRIAL AMERICA

Schematic Treatment 45

Thematic Labels 46

List of Exhibit Component 51

SCHEMATIC TREATMENT:
MAKING LINEN IN RURAL NEW ENGLAND

This videotape presentation will show stages in hand manufacturing linen in a rural New England household during the early part of the nineteenth century. The show will be taped at Old Sturbridge Village, where the complete process--growing flax, spinning, weaving, etc.--is already part of their interpretive program.

Using time-lapse, the entire presentation will run approximately two minutes. To indicate the breadth of women's work on an early nineteenth-century farm, a variety of other tasks--cooking, baking, sewing, churning butter, knitting, milking cows, feeding chickens, and childcare--will be interspersed. Viewers will also see the relationship of women's work to the seasonal cycle of farm activities, especially planting, cultivating, and harvesting flax.

The soundtrack will consist of period music. If scripting is included, it will consist of excerpts from the diaries of Sally and Pamela Brown (1832-1838) of Plymouth Notch, Vermont.

THE DAWN OF AN ERA 1790-1820

In 1790, when the United States Government conducted its first census, the total population of the country was four million. Philadelphia, the nation's largest city and its capital, consisted of 42,000 people.

Thirty years later, in 1820, the population of the United States had more than doubled. According to the national census there were 9.6 million people living in the country, and the nation's largest city--New York--had a population of 124,000 people.

These three decades were a period of substantial transformation in the New Nation. Although the country remained overwhelmingly agricultural during these years, signs of change were apparent everywhere, especially in the New England and Middle Atlantic states.

A growing transportation network which included canals, turnpikes, and a shipbuilding industry; a national banking system; a stable government, both locally and nationally; and an increasing enthusiasm for technology heralded the coming of a new era in American life.

Eventually, diverse elements within the country combined to set in motion the Industrial Revolution in America. With cotton grown in the Southern states; money from wealthy merchants; political support and encouragement from the federal government; as well as the labor and genius of many people, the new nation entered the industrial age.

EAST CHELMSFORD:
RURAL NEW ENGLAND IN 1820

East Chelmsford--the name for this settlement before it was incorporated as the town of Lowell in 1826--was a typical New England rural community during the first two decades of the nineteenth century. The overwhelming majority of its residents were farmers who grew their own food and made their own clothing.

Farming was family work with men, women, and children all contributing to the household economy. Generally males worked in the fields, while females worked in the home and around the barnyard.

Farm families sometimes supplemented their income by selling surplus crops, cheese, and eggs. In addition, many of the men worked as craftsmen--blacksmiths, coopers, cabinetmakers--during the lax winter season.

During the late eighteenth and early nineteenth centuries, East Chelmsford began to change. The Pawtucket Canal (1796), the Middlesex Canal (1804), and the Middlesex Turnpike (1810) linked this small inland community with Boston, Newburyport, northern New England and the interior of Massachusetts. Using available water power, a few enterprising businessmen constructed several small mills--sawmills, gristmills, and fulling mills--to serve the local farm population.

Signs of the coming industrial order began to appear after 1800. A glass factory, two gunpowder mills, a cotton spinning mill, a woolen mill with power looms, a machine shop, three stores, and two hotels dotted the East Chelmsford landscape in 1821. Even before Boston money transformed this small community into a world-renowned textile center, East Chelmsford--like many other towns in New England--had begun to enter the industrial age.

BOSTON MERCHANTS

A small group of Boston-based capitalists funded and profited from the Lowell experiment. These men--for example, Francis Cabot Lowell, Nathan Appleton, Patrick Tracy Jackson--were shrewd investors who had made large fortunes from international trade after the American Revolution.

Many of the Lowell "founding fathers" originally came from the North Shore of Massachusetts, especially Newburyport. Even before joining together to invest in factories, they were well acquainted with one another. Indeed, they cemented their early business dealings by marrying into each other's families.

As young men, they sailed the world--to India, China, Europe, Africa, South America, and the Pacific Islands--trading goods and reaping profits. When England and France went to war in the 1790s, these men nearly cornered the Atlantic merchant trade.

Their economic bubble burst in 1807 when the American Government imposed an embargo on trade with France and England. Boston merchants immediately sought new, low-risk ventures. Consequently, they invested in real estate, insurance companies, and country banks.

In 1810, Francis Cabot Lowell discovered another opportunity. Traveling in England he saw for himself the fast growing textile industry. When he returned to Boston he persuaded several friends to invest in a manufacturing scheme.

Although some of his associates were hesitant, Lowell convinced a small group to join him in establishing the Boston Manufacturing Company. The group located the factory on the Charles River in Waltham, Massachusetts.

In 1814 the new textile mill began operations. The venture was very profitable, and these early industrial capitalists therefore decided to expand their operations into East Chelmsford. They believed the new industrial order would assure their position in a rapidly changing world.

PLANTATION ECONOMY

During the era of the American Revolution many Southern planters--who grew tobacco, indigo, and rice--began to confront serious economic difficulties. Their land was exhausted, competition was keen, and the market glutted with their produce.

The emergence of the textile industry in England and the invention of the cotton gin provided many Southern planters with a new source of income.

Before the cotton gin was developed, Southern farmers grew only small amounts of long-staple cotton in the lowlands of South Carolina and Georgia. The gin made it economically feasible for Southerners to cultivate seedy short-staple cotton. The crop could be raised in upland areas of the coastal states as well as in Alabama and Mississippi.

Southerners considered cotton a "miracle crop." Initially it was sent to England, but as Northern capitalists began constructing textile mills in New England, they provided Southern planters with a new market.

During the early years of the nineteenth century, the demand for cotton consistently outpaced supply. In 1790 Southern planters produced 3,135 bales of cotton. Twenty-five years later, in 1815, they produced 208,986 bales. Still there was not enough cotton, and the first Lowell textile factory had not yet even been established.

Even though Southern planters developed a slave labor system while Northern industrialists were committed to free labor, these two groups maintained close political and economic ties during the first half of the nineteenth century. The American Civil War eventually shattered this marriage of convenience.

INDUSTRY EMERGES

The birthplace of the American Industrial Revolution was in England. During the eighteenth century a host of changes and innovations--resulting in the steam engine, the water powered spinning frame, the power loom, and improved precision machine work--helped lay the foundation for an industrial system in Britain.

By the time of the American Revolution, England had spinning and weaving mills which employed a growing labor force. The British government, intent on maintaining its economic advantage, enacted laws prohibiting both the export of new machines and the emigration of skilled mechanics.

Nevertheless, early textile mills began appearing in America. Short-lived ventures existed in Paterson, New Jersey and Beverly, Massachusetts during the late eighteenth century. An important breakthrough occurred when Samuel Slater--a British mechanic--emigrated from England posing as a carpenter. In 1792 Slater joined forces with Samuel Almy and Moses Brown to establish America's first successful spinning mill in Pawtucket, Rhode Island.

Twenty-one years later, a group of Boston merchants pooled their resources and took another step toward a new industrial order. With the help of a British master mechanic, Paul Moody, they built a power loom based on British precedents.

They were even more innovative when organizing their first mill in Waltham, Massachusetts. They conceived of the entire mill as a single, integrated manufacturing system. Consequently, they established a textile factory where all the machines needed to make cloth were placed under one roof. In addition, all the machines were driven by water power.

In 1821, when these same industrialists decided to construct textile mills in East Chelmsford, they were building on precedent and experience. Although the integrated mill complexes in Lowell were much larger than any others in America at that time, they were part of an evolutionary process.

AREA 2.1: PRE-INDUSTRIAL AMERICA

EXHIBIT COMPONENTS

AREA 2.1.1: EAST CHELMSFORD

1. Primitive painting of East Chelmsford
Reproduction (Colonial Williamsburg)
2. Maps showing farm plots in Chelmsford
Reproduction (L&C, LHS)
[See PINs - 3119, 3120, 3164]
3. Maps of Chelmsford showing mills, canals, glass factory, etc.
Reproduction (L&C, LHS)
[See PINs - 378, 480, 3116, 3117, 3118, 3121, 3123, 3124]
4. Illustration of Thomas Hurd's mill
Reproduction (L&C)
PIN - 3122
5. Illustration or plan of grist mill
Reproduction
6. Illustration or plan of hotel in Chelmsford
Reproduction
7. Illustration and/or plan of machine shop
Reproduction
8. Saw from saw mill
Reproduction
9. Fulling model
Reproduction (LNHP)

AREA 2.1: PRE-INDUSTRIAL AMERICA

EXHIBIT COMPONENTS

10. Farm tools Reproduction

plow
harrow
shovel
hoe
pitchfork
axe
rake
scythe
yoke
buckets

11. Large-scale image of hand weaving and spinning process

12. Time-lapse video of cloth-making process from flax

13. Spinning wheel Original (LNHP) [See PINs - 2089, 2090]

14. Niddy noddy Original (LNHP) PIN - 2069

15. Swift Original (LNHP) PIN - 2067

16. Hand cards (flax hatchels) Original (LNHP) PIN - 2439

17. Hand loom Original

AREA 2.1: PRE-INDUSTRIAL AMERICA

EXHIBIT COMPONENTS

18. Homespun garments
Reproduction
19. Portraits of farm families
20. Sign: Rates of toll (canal)
Original (LHS)
PIN - 1549
21. Store account books
Reproduction (New Hampshire Historical Society)
[See PINs - 2224, 2225]
22. Store samples
Reproduction

AREA 2.1.2: THE SOUTH

1. Graphic background
2. Map of cotton states
Reproduction
3. Plantation plan showing slave quarters
Reproduction
4. 1820s maps of plantations
Reproduction
5. Image of harbor--cotton being shipped
6. Trade routes
Reproduction

AREA 2.1: PRE-INDUSTRIAL AMERICA

EXHIBIT COMPONENTS

7. Account books
Original or Reproduction
 8. Bills of sale for cotton
 9. Illustration of plantation family
 10. Illustration of slaves working
Reproduction
 11. Cotton bolls
 12. Cotton sack
Reproduction
 13. Cotton gin or plantation spinner with built-in cotton gin
Original or Reproduction
 14. Eli Whitney's patent
Reproduction
 15. Bales of cotton
 16. Slave clothing (negro cloth)
Reproduction
 17. Cotton samples
 18. Plantation implements
Reproduction
- bale hooks
 - hoes
 - shovel
 - sacking
 - cotton seed

AREA 2.1: PRE-INDUSTRIAL AMERICA

EXHIBIT COMPONENTS

AREA 2.1.3: MERCANTILE BOSTON AND THE BOSTON ASSOCIATES

1. Map of Boston, ca. 1810
Reproduction
2. Illustration of Newburyport shipbuilding industry
Reproduction
3. Portraits of merchants
 - a. Abbott Lawrence
Reproduction (MATH, BA, City of Lowell)
[See PINs - 56, 57, 956]
 - b. Nathan Appleton
Reproduction (MATH, City of Lowell)
[See PINs - 45, 46, 47, 788]
 - c. Kirk Boott
Reproduction (U/Lowell, City of Lowell, LM)
[See PIN - 48, 59, 4116]
 - d. Francis Cabot Lowell
 - e. Patrick Tracy Jackson
Reproduction (City of Lowell)
[See PIN - 55]
 - f. Paul Moody (?)
Reproduction (LNHP)
[See PIN - 1631]
4. Illustration of Boston counting house
Reproduction

AREA 2.1: PRE-INDUSTRIAL AMERICA

EXHIBIT COMPONENTS

5. World trade map with chart of major trade routes
Reproduction
6. Images of shipbuilding, loading freight
Reproduction
7. Bill of Lading, customs charges, etc.
Reproduction (Peabody Museum)
PINs - 4269, 4282, 4286, 4287, 4292, 4298, 4300
8. Ship log
Reproduction
9. Ship manifests
Reproduction (Peabody Museum)
PINs - 4275, 4276, 4278, 4279, 4288
10. Shipping and trade-related advertisements
Reproduction (Peabody Museum)
PINs - 4270, 4271, 4272, 4273, 4274, 4277, 4280, 4283, 4284,
4285, 4290, 4293, 4294, 4295, 4296, 4297, 4299
11. Insurance Policies
Reproduction (Peabody Museum)
PINs - 4291, 4301, 4302
12. Trade goods and imported items:
Reproduction
 - China
 - Fabric
 - Furniture
 - Liquor (especially rum)
 - Spices
 - Otter pelts
 - Nails

AREA 2.1: PRE-INDUSTRIAL AMERICA

EXHIBIT COMPONENTS

13. Ship models
Original or Reproduction
14. Navigational equipment, such as a compass
Original or Reproduction
15. Debtors' papers (IOUs)
Reproduction

16. Stock certificates
Original (LM)
[See PIN - 470]

16. Ledgers, bank notes, bills of exchange
Original (LNHP, Private Collection)
[See PINs - 1911, 2155]

18. Documents related to the building of mills at Lowell
Original and Reproduction (LNHP, BLHU)
[See PINs - 24, 2121, 2124, 2159, 2162, 2167, 2169]

19. Illustrations of the merchants' rich lifestyle
Reproduction
[See also the pamphlet, "The Aristocracy of Boston," 1848, in the
Flather Collection]

AREA 2.1.4: MODELS OF INDUSTRIALIZATION

1. Large-scale Waltham model
To be made

2. Painting of Waltham
Original (LHS)

AREA 2.1: PRE-INDUSTRIAL AMERICA

EXHIBIT COMPONENTS

3. Illustrations of British factory towns, mills, etc.
Reproduction (Bettman Archive, U/Lowell)
[See PINs - 405, 406]

4. Illustrations of British technology and textile machines (such as
early steam engine parts)
Reproduction

SECTION 2.2: HAMILTON-JEFFERSON DEBATE

Thematic Labels 58

List of Exhibit Component 59

THE HAMILTON-JEFFERSON DEBATE

After the American Revolution there was a serious debate in the nation concerning the nature of American society. Although much of the discussion centered around issues of politics and republicanism, it included economic and social matters also. The debate also focused on the role and place of industry in the new country.

Alexander Hamilton, a leading conservative visionary, was an outspoken proponent of large-scale industrial manufacturing. As the Secretary of the Treasury in Washington's administration, Hamilton authored a *Report on Manufacturers* in 1791. In it he maintained that industry would insure political independence; that it would benefit all classes of Americans; and that it would make America a powerful, wealthy, and productive nation.

Many prominent Americans endorsed Hamilton's position. George Washington, John Adams, Benjamin Franklin, and Benjamin Rush hailed the benefits of technology and industry. Like Hamilton, they also believed the government should actively promote industrialization.

Other citizens championed a different vision of American society. Led by Thomas Jefferson, they feared the emerging industrial order would destroy American republicanism. In his *Notes on Virginia*, Jefferson claimed that small farmers were God's chosen people. He believed that democracy would flourish only in a land of small agricultural property owners. For Jefferson and his followers rural ways guaranteed political virtue.

Although Jefferson's democratic values were popular, Hamilton's vision of wealth and power through industry proved extremely attractive. Americans tried to join the two visions. They elected Jefferson president in 1800, and at the same time they supported rapid industrialization.

For his part, Jefferson eventually dropped much of his opposition to industry but not his belief in republican virtue.

AREA 2.2: HAMILTON-JEFFERSON DEBATE

EXHIBIT COMPONENTS

1. Portrait of Thomas Jefferson
2. Portrait of Alexander Hamilton

SECTION 2.3: THE MILL SYSTEM

Thematic Labels 61

List of Exhibit Components 64

The Mill System

When it began operations in 1836, the Boott Mills consisted of four large identical mill buildings. Powered by water from the Merrimack River, each of these buildings was a fully integrated, self-contained unit with a full complement of machines for turning raw cotton into cloth.

Each of the large mill buildings was four stories high. The floors measured 150' x 45'.

The individual mill buildings produced different products. Mill No. 1 produced coarse drillings. Mills No. 2 and No. 3 made finer shirtings and prints. In Mill No. 4 the product was "negro cottons" which was sold to Southern planters to clothe field slaves.

Because each mill was producing a different kind of cloth, the precise route which the cotton followed in its progress through individual mills differed. Generally, the cotton moved up the factory with early stages performed on the lower floors and final phases done on the top floors. Later, it was learned that this route was neither efficient nor safe.

During the 120 years of operations at the Boott Mills, changes in the production system were introduced. New buildings were added. The entire complex was integrated. Water power gave way to electricity. Machines were improved. The lay-out of machines and the flow of the cotton through the buildings was redesigned.

Notwithstanding these innovations, the ideal of a mill system with an integrated sequence of mechanized process which transformed raw cotton into finished cloth remained unchanged.

BALE TO BOLT: THE INDUSTRIAL PROCESS

In Lowell's large textile factories, workers transformed raw cotton into finished cloth. Virtually the entire process was performed under a single roof.

With the exception of power generation and transmission, the basic technology in an integrated textile factory has changed little since the first part of the nineteenth century. In all there are ten distinctive steps in making cloth:

1. **Preparation:** Cotton is opened, picked, and cleaned.
2. **Carding:** Cotton fibers are combed and straightened.
3. **Drawing:** Long slivers of combed cotton are stretched and combined.
4. **Roving:** Slivers are drawn out or lengthened still further and given a slight twist.
5. **Spinning:** The elongated roving is given a hard twist to lock the fibers together, and then it is wound onto bobbins.
6. **Dressing:** The strong warp yarn is coated with a hot starchy glue to further strengthen it.
7. **Warping:** The warp yarn is wound onto a beam which is fitted onto a loom, and then the individual yarns are threaded through the loom harness.
8. **Weaving:** Two kinds of yarn--the strong warp and the soft filling--are interlaced on the loom to make cloth fabric.

9. Finishing: The cloth is inspected for faults and the edges are trimmed.

10. Baling: The cloth is pressed into bolts in preparation for shipping.

AREA 2.3: THE MILL SYSTEM

EXHIBIT COMPONENTS

1. Animated model of Boott Mills, ca. 1836
To be made
2. Illustrations of early American textile mills, such as those in Paterson (N.J.), Pawtucket (R.I.), Beverly (MA), and Waltham (MA)

SECTION 2.4: MILL MACHINERY

Schematic Treatment 66

Thematic Labels 67

List of Exhibit Component 68

**SCHEMATIC TREATMENT:
WORKING IN THE BOOTT COTTON MILLS**

To further underline the human dimension in the industrial process, there will be at least two videotaped oral interviews stations located near textile machines. (The final number will be based on impact, budget, and design considerations.) Here people who worked in the Boott or other Lowell textile mills will describe their work lives. Taping will be done at a factory-like setting. Historical photographs will be interspersed with contemporary footage.

Subjects covered in the interviews will include:

- 1) Work responsibilities, duties, and wages
- 2) The experience itself and the length of employment
- 3) Relationships with other workers and with management
- 4) Health and safety conditions

Each program will run approximately five minutes and will include no less than three interviews.

These presentations--visually and in content--will contrast with the video program on making linen by hand which will be located in the previous exhibit area.

WORKING IN THE MILLS

In Lowell's textile factories, machines made cloth, but people invented, operated, repaired, and improved the machines.

Most factory floors were--and still are--places of tremendous noise and subtle human struggles. Managers tried to get the most out the workers by speeding up machinery, increasing the number of machines an operator tended, making equipment more efficient, decreasing the level of skill required by workers, and keeping pay as low as possible. In turn, laborers tried to maintain a degree of control over their work, improve conditions, increase wages and piece rates, and move up.

Over time the labor force in the Lowell mills changed. Initially the overwhelming majority of workers employed here were single women from northern New England farms. When these Yankee women became disillusioned with wages and conditions, factory owners recruited cheap immigrant laborers--first Irish and subsequently French-Canadian, Greek, Polish, Portuguese, Colombian, and many others.

This human dimension of factory work is as important as the technological story. The oral histories and quotations included in this section relate the day-to-day experiences and struggles of the people who operated the machines in the textile factory.

AREA 2.4: MILL MACHINERY

EXHIBIT COMPONENTS

1. Two audio-visual programs based on oral histories of workers
2. Machinery
 - a. Speeder or roving frame (Moody's invention)
Original (LNHP)
PIN - 4348
 - b. Section of a ring spinner
Original (MATH)
PIN - 115
 - d. Drawing frame
Original
 - e. Loom
Original
3. Hand tools for each machine
Original (LM, LNHP, Private Collection)
[See PINs - 1158, 1159, 1160, 1162, 2152, 2703]
4. Samples of the input and output products for each process represented by a machine
[See PIN - 1727]
5. Illustrations of machinery
 - a. Breaker
Reproduction (NYPL, MATH)
[See PINs - 179, 180, 181, 182]

AREA 2.4: MILL MACHINERY

EXHIBIT COMPONENTS

- b. Carding machine
Reproduction (MATH)
[See PINs - 175, 176]

 - c. Lapper
Reproduction (MATH)
[See PIN - 177]

 - d. Roving frame
Reproduction (BLHU)
[See PIN - 169]

 - e. Spinning frame
Reproduction (BPL, MATH, U/Lowell)
[See PINs - 170, 171, 172, 173]

 - f. Twister
Reproduction (MATH)
[See PIN - 174]

 - g. Warper
Reproduction (MATH)
[See PIN - 161]

 - h. Looms
Reproduction (BPL, MATH)
[See PINs - 163, 166, 167, 168, 696]
6. Illustrations of machinery with people
- a. Drawing frames
Reproduction (MATH, U/Lowell)
[See PINs - 402, 404]

AREA 2.4: MILL MACHINERY

EXHIBIT COMPONENTS

- b. Roving
Reproduction (Bettman Archives)
[See PIN - 395]

 - c. Spinning
Reproduction (U/Lowell, Bettman Archives)
[See PINs - 384, 396, 398, 399]

 - d. Winding bobbins
Reproduction (MATH)
[See PIN - 692]

 - e. Drawing-in and weaving
Reproduction (MATH, NYPL, U/Lowell)
[See PINs - 379, 385, 397, 403, 695, 872, 2291]
7. Photographs of machinery and mill rooms
- a. Pickers
[See PINs - 187, 188, 189, 190, 978, 1905, 1906]

 - b. Carding
[See PINs - 191, 192, 193, 749, 976, 977, 1472]

 - c. Drawing frames
[See PIN - 625]

 - d. Roving
[See PINs - 195, 197, 1467, 1471]

 - e. Spinning
[See PINs - 68, 185, 198, 199, 200, 201, 202, 626, 1473,
1892, 1898]

 - f. Warping
[See PINs - 203, 1470]

AREA 2.4: MILL MACHINERY

EXHIBIT COMPONENTS

- g. Weaving and cloth inspection
[see PINs - 183, 184, 204, 205, 206, 742, 743, 744, 745,
1474, 1897, 2149]
- 8. Photographs of machinery and mill rooms with workers
 - a. Carding
[See PINs - 2236, 2238, 2242]
 - b. Roving
 - c. Spinning
[See PINs - 228, 229, 231, 234, 345, 348, 1468, 1469,
2244, 2246, 2250, 2256, 2257]
 - d. Warping
[See PINs - 2249, 2254, 2547]
 - e. Drawing-in
[See PINs - 346, 1733]
 - f. Weaving and cloth inspection
[See PINs - 213, 233, 350, 360, 363, 1391, 1465, 2108,
2239, 2241, 2252, 2255, 2258]
 - g. Printing
[See PIN - 867]
 - h. Miscellaneous photographs of mill interiors and workers
[See PINs - 210, 212, 226, 227, 230, 232, 235, 347,
1393, 1441, 1523, 1729, 1823, 2240, 2247, 2248, 2259,
2292, 2301, 2303]
 - i. Group shots of mill workers
[See PINs - 349, 351, 352, 353, 354, 359, 361, 362, 529,
629, 865, 1520, 1522, 1524, 2805]

AREA 2.4: MILL MACHINERY

EXHIBIT COMPONENTS

9. Shuttle (with looms)
Original (LNHP)
[See PIN - 1639]

10. Books used by mill workers
Original (LM, LNHP)
[See PINs - 756, 1658, 1663, 1659, 1708, 1834, 1979,
1980, 1981]

SECTION 2.5: MANAGEMENT

Thematic Labels 74

List of Exhibit Components 76

THE OVERSEER'S OFFICE

Overseers directly supervised textile workers on the mill floor. During the first half of the nineteenth century these low level managers were overwhelmingly white males of either English or American birth. Before becoming overseers, most of them had been skilled craftsmen or machinists.

To assist them in their work, overseers hired assistants called second hands. Many of the second hands in the early Lowell mills were the sons or relatives of overseers.

Irish workers started to break into the ranks of second hands and overseers after the Civil War years. Such positions were considered stepping stones to the better life in America.

These positions carried considerable responsibility and stress. They were in the frontlines during labor-management conflicts. After being promoted, many second hands found themselves cut off from former friends as they rose into the ranks of low level management. Moreover, second hands and overseers were encouraged to cultivate divisiveness among ethnic workers to prevent labor solidarity.

Our overseer's office exhibit is based on one at the Appleton Mills during the second decade of the twentieth century. It is modeled after an office which was located in the Appleton Mill.

MANAGING THE MILLS

When the Boston Associates established their first mill in Waltham, Massachusetts in 1814, they instituted a traditional management structure. Patrick Tracy Jackson, one of the owners of the Boston Manufacturing Corporation, served as the on-site managerial Agent for the owners as well as Treasurer of the operation.

When these same capitalists financed new mills in Lowell during the 1820s, however, a clear distinction between owners and managers began to emerge. Owners, for the most part, lived in Boston. Only rarely did they come to Lowell. To safeguard their financial investment, the owners appointed a Treasurer, usually one from their circle who had an office in Boston.

Agents were in charge of the day-to-day operation of the mill. At first, they had little technical knowledge of the textile industry, but they were upright gentlemen with dominating personalities. They were hired with the hope that they would command the respect of the workers and promote the new industrial order in the community. They usually owned some stock in the company too.

Over the course of the nineteenth century owners began to hire agents for their expertise, first in technology and later in business management. Agents became a distinctive group who were separate from the owners. In fact, they often found themselves in conflict with the owners over a variety of areas. The interests of owners and managers were no longer the same by the late nineteenth century.

AREA 2.5: MANAGEMENT

EXHIBIT COMPONENTS

AREA 2.5.1: OFFICE FURNISHINGS

1. Desk
Original (LNHP)
[See PINs - 1622, 1619]
2. Chair
Original (LNHP)
PIN - 2332
3. Clock
Original (LM)
PIN - 1578
4. Telephone
Original
5. Calendar
Original
6. Writing set
Original (LM)
PIN - 1643
7. Whistle
Original (LNHP)
PIN - 1745
8. Supervisor's Manual
Original (LM)
PIN - 35

AREA 2.5: MANAGEMENT

EXHIBIT COMPONENTS

9. Textile Bluebook
Original (LNHP)
PIN - 1978
10. Payroll records
Reproduction (BLHU)
[See PIN - 475]
11. Account book/ledger
Reproduction or original
12. Forms, notices, etc.
Original (LNHP, U/Lowell, LM)
[See PINs - 383, 2182, 3177]
14. Correspondence with owners, etc.
Original (LNHP)
[See PIN - 2182]
15. "The Customer" broadside
Original (LM)
PIN - 3189

AREA 2.5.2: MANAGEMENT-RELATED INFORMATION

1. Photographs of overseers in offices and on mill floors
[See PINs - 52, 363, 1755, 2333, 2334]
2. Illustrations of managers
Reproduction
[See PINs - 51, 54, 4114, 4115]

AREA 2.5: MANAGEMENT

EXHIBIT COMPONENTS

3. Illustrations of management housing
Reproduction (L&C)
[See PIN - 846]
[See also border illustrations on map of Lowell, LNHP]

4. Photographs of overseer's residence
[See PIN - 800, 4113]

5. Consultant reports
Reproduction (BLHU, LM)
[See PINs - 29, 1671, 1672]
[See also documents in the Flather Collection listed below]

Report on Condition of Boott Mills, 1902
Industrial Audit Report on Labor Situation, 1916
(PIN - 4110)
Efficiency Study Program, 1935-1951
Boott Studies, 1946-1947, 1947-1953

6. Organizational charts
Reproduction
[See also documents in the Flather Collection listed below]

Organization of Labor Force for Production, 1934-1936
Staff Organization and Personnel Files, 1946-1953

7. Work schedules, mill time schedules, etc.
Reproduction
[See also documents in the Flather Collection listed below]

Papers relating to piecework rates, 1878-1890, and n.d.
Wage and Cost Rates, 1864-1893
Wage Schedules, 1907-1910
Piece rates and Hourly Rates, 1919

AREA 2.5: MANAGEMENT

EXHIBIT COMPONENTS

Wages and Hours History, 1906-1937

Wages and Hours, 1936-1937

8. Regulations

Original and Reproduction (LNHP, BLHU, U/Lowell, MATH,
Mass Historical Society)

[See PINs - 461, 462, 691, 874, 876, 2584]

9. Production records

Reproduction (MATH)

PIN - 4118

[See also documents in the Flather Collection listed below]

Cost Analysis and Estimate Records (Fabrics),
1905-1915

Production Flow Charts, 1949

10. Financial papers

Reproduction (BLHU)

[See PINs - 31, 697, 698, 4109]

[See also Petition for abatement of taxes, 1897; Flather
Collection]

11. Accident Reports

Original and/or Reproduction (BLHU, LNHP)

[See PINs - 472, 484, 1738]

[See also "Safety, Usage and Arrangements, 1935, 1945;
Flather Collection]

12. Management-labor related documents

Original and Reproduction (LNHP, MATH)

[See PINs - 1709, 1747, 2121, 2124, 4124, 4103]

AREA 2.5: MANAGEMENT

EXHIBIT COMPONENTS

13. Complaints of stockholders against Boott management
Reproduction (BLHU)
PIN - 39
14. Rules for Office Staff, n.d.
Reproduction (Flather Collection)
15. Rating of Supervisors, 1926
Reproduction (Flather Collection)
16. Overseers' premium payments
Reproduction (MATH)
PINs - 4123, 4122
17. Code of Ethics for Industry
Original (LM).
PIN - 4108
18. Safe
Original (LNHP)
PIN - 1599
19. Model of the Merrimack Mills
Original (LM)
PIN - 1582
20. Overseer's Banquet menu
Original (LNHP)
PIN - 2794

AREA 2.5: MANAGEMENT

EXHIBIT COMPONENTS

21. Management-related books

Original (Flather collection)

****Note: Choices may be made to supplement books listed above or as additional exhibition material****

The Depreciation of Factories, 1893

The Commercial Organization of Factories, 1896

"A Bonus System of Rewarding Labor," 1901

"Money-Making Management for Workshop and Factory,"
1902

Friction and Lubrication: A Handbook for...

Superintendents and Managers, 1904

The Economical and Successful Management of Cotton
Mills, 1905

Organizing a Factory, 1905

Nicholson on Factory Organization and Costs, 1909

"Lectures on Organization," 1910

Psychology and Industrial Efficiency, 1913

Factory Organization and Administration, 1914

Business Administration, 1921

"Foremanship Training," 1922

Senate Hearings on "Hours of Labor" and "The Two-Shift
Bill," 1924

"Report of a Special Investigation into Conditions in the
Textile Industry in Massachusetts and the Southern
States," 1923

Labor Relations Board. "Rules and Regulations," 1936

Applying Natural Laws to Production, 1937

Personnel Practices, 1937

"How to be a Good Foreman," 1937

AREA 2.5: MANAGEMENT

EXHIBIT COMPONENTS

Wage Setting Based on Job Analysis and Evaluation, 1943

"Collective Bargaining," 1943

"Management Guide for Collective Bargaining," 1943

The Foreman's Basic Reading Kit, 1944

"Proposition to Increase Production Through Sociological
Personnel Development," 1950

"Practical Methods of Management Development," 1951

Office Management, 1951

Incentive Management, 1951

"Motion Time Analysis Bulletin," 1956

"Labor Relations: An Outline for Management," n.d.

SECTION 2.6: CONFLICT

Schematic Treatment 84

Thematic Labels 85

List of Exhibit Components 91

SCHEMATIC TREATMENT:
THE I.W.W. STRIKE OF 1912

This interactive video program will give visitors an opportunity to learn about the successful I.W.W. strike in Lowell during the early months of 1912. Costumed actors in role will present various positions: labor, management, and ownership. Because of the complexity of the strike, there may be more than one worker portrayed in the program. There could, for example, be an unskilled I.W.W. laborer, a skilled AFL craftsman, a Greek store owner, a mill agent, and a Boston owner.

Because the program is interactive, viewers will be able to determine whose position they would like to see and hear. They could even request a debate between a worker and a manager, between two workers, or between a manager and an owner.

The script will be based on newspaper accounts, company records, as well as Congressional investigations and hearings.

FACTORY STRIKES: THE GOLDEN ERA, 1830-1860

Notwithstanding the initial hopes of all parties, conflict between the predominantly female workers and the mill owners emerged during the early years of the Lowell experiment. In 1821, even before this city's first mill was operating, female textile workers in Waltham initiated a strike against the Boston Manufacturing Company.

In Lowell the first recorded "turn-out" (or strike) occurred in February 1834. Boston owners confronted by diminishing profits cut workers' wages. The women circulated petitions and began organizing. When one of their leaders was fired, 800 women stopped working for two days. The action, however, was unsuccessful, in part because the women--who did not have the right to vote at the time--lacked the kind of political influence which owners brought to bear on the state legislature.

Two years later--in October 1836--over 1,500 women joined a "turn-out" protesting an increase in room and board rates at corporation owned boardinghouses. The women were better organized this time. To coordinate activities they formed the Factory Girls Association. After two months of protest, the owners rescinded some of the increases.

During the 1840s textile workers founded the Lowell Female Labor Reform Association. Headed by Sarah Bagley, a militant labor reformer, the women appealed to the Massachusetts legislature to pass a law establishing a ten hour workday. The women testified at committee hearings, organized public rallies, attended mass meetings throughout the state, and published a newspaper, the *Voice of Industry*. Still they were defeated.

Labor militancy subsided during the 1850s. Nevertheless, some workers remained active. Skilled male machinists at the Lowell Machine Shop won an eleven hour workday in 1853. Six years later, in 1859, approximately 500 female Irish spinners went out on strike to protest low wages. Managers squelched this small movement by bringing in Yankee women as strikebreakers. The golden era ended in strife--between workers and

managers and also among the workers themselves. In the Lowell textile factories, labor unity did not emerge until the twentieth century.

THE MULE SPINNERS' STRIKE, 1875

Conflict within the working class--especially between unskilled ethnic workers and highly skilled laborers--was a recurrent problem during the second half of the nineteenth century. Managers of the mills purposely cultivated these divisions and defeated many labor actions in the process. The complexity of the problem can be seen in the mule spinners' strike of 1875.

Mule spinners were one of the few well organized, highly skilled groups of craftsmen working in the mills. Overwhelmingly men of English and Irish birth, they performed a critical task in the textile process, spinning both warp and the finer filling yarn. Because the owners needed these craftsmen, the mule spinners effectively used their position to maintain a high degree of independence on the job.

The development of ring spinning machines threatened the job security of mule spinners. The ring spinner produced warp yarn cheaply, largely because it could cut labor costs. Unlike the mules, ring spinners were operated by low-paid, unskilled Irish, and French-Canadian female workers.

In the 1870s the mule spinners of New England organized to defend their craft and jobs. In 1875 their union, the Mule-Spinners' Association of the United States, called a strike in Lowell to raise wages which had been cut during the depression of 1873. Management responded by hiring additional unskilled women to operate new ring spinning machines. The female ring spinners in Lowell unexpectedly went out on strike hoping to ally with the protesting mule spinners.

The skilled mule spinners--a proud lot--refused to join forces with the unskilled women. Without support from the craftsmen and without a strike fund, the women soon returned to work. Managers welcomed the women back and hired additional strikebreakers. In turn, mule spinners concentrated their efforts on intimidating the strikebreakers. Their action turned violent and was publicly condemned.

As a consequence of the strike many mule spinners lost their jobs and were blacklisted. Their failure to join ranks with the unskilled women and their narrow concept of the craft union made it impossible for mule spinners to adapt to the technological changes of the 1890s. Eventually their positions were supplanted by a new machine and unskilled workers. Among mule spinners and ring spinners feelings of bitterness continued for several years.

THE STRIKE OF 1912

In 1912 textile workers of Lowell achieved a degree of success and solidarity never before attained. Led by the Industrial Workers of the World or the Wobblies, a general strike--based on cooperation among the skilled and unskilled, men and women, and peoples of all ethnic groups--was organized.

The famous Bread and Roses strike in Lawrence preceded the Lowell action. The Lawrence strikers, guided by IWW leaders, had won a 5% to 17% wage increase after violent and dramatic labor confrontations during the winter of 1912.

Lowell owners and managers hoping to avoid a similar outbreak in their factories promised local workers a 5% wage increase. On March 25, Portuguese and Lithuanian members of the IWW at the Appleton Mill went out on strike and called for a 15% raise. Within a day almost 6,000 workers had joined the action. Owners responded by closing the mills and locking out an additional 8,000 laborers.

When the whole Greek community--which had remained independent during previous strikes--supported the immediate wage goals of the IWW, the protesting workers had won a major victory. The United Textile Workers (AFL), a craftworkers association, also gave its support to the demand for a wage increase, although it tried to undercut the IWW at the same time.

The Lowell strike featured massive, non-violent parades of workers in the mill district and through the city's streets. Strikers carried the American flag, the red banner of the IWW, and banners of various national groups.

Fearing the success of the IWW, the New England Association of Textile Manufacturers censured the Lowell managers and offered a 10% industry-wide wage increase. At a mass meeting on Lowell's South Common in late April, over 10,000 striking workers voted to accept the

raise.

The 1912 strikes in Lawrence and Lowell were the high point of IWW organization in New England. These actions also clearly demonstrated the possibilities of industrial unionism and ethnic solidarity for textile workers

AREA 2.6: CONFLICT

EXHIBIT COMPONENTS

AREA 2.6.1: MILL GIRLS, 1830s-1860

1. Employment regulations, 1829
Reproduction (MATH)
PIN - 4125
2. Circulars announcing wage reductions and boardinghouse increases
Reproduction (BLHU)
[See PIN - 3147]
3. Proclamations and/or petitions of striking women workers, 1834,
1836
Reproductions (MATH)
PIN - 4121
[See also Boston Evening Transcript Feb 18, 1834]
4. Petitions for board increases by keepers, 1835
Reproduction (MATH)
PIN - 4119
5. Newspaper headlines, articles about turn-outs
[See Boston Evening Transcript Feb 17, 1834]
6. Names of operatives who turned out, 1834
Reproduction (MATH)
PIN - 4126
7. Articles about Factory Girls' Association during 1836 turn-out
[See National Labourer Oct 29, 1836]
8. Announcement of withdrawal of boardinghouse increases, 1836
[See Zion's Herald, Oct 19, 1836]

AREA 2.6: CONFLICT

EXHIBIT COMPONENTS

9. Worker's writings about mill work and working conditions
Reproduction (Lowell Offering, Voice of Industry, Brown University, LHS)
[See PINs - 426, 428, 430, 431, 432, 477]
10. Blacklisting letter, 1847
Reproduction (MATH)
PIN - 2771
11. Writings of Orestes Brownson about working conditions, 1840s
12. Worker petitions
Reproduction (Mass State Archives)
[See, for example, Petitions 1587/8, 1587/9, 11983]
13. Management correspondence about speed-ups, stretch-outs, the premium system, and the 10 hour movement
Reproduction (MATH)
PIN - 4196
[See Layer, "Wages, Earnings and Output"]
14. Workers' complaints with speed-ups, etc.
[See Voice of Industry, Sept. 11, March 13, May 15, Jan. 30, 1846;
Jan. 8, Feb. 11, 1847]
15. Charter, constitution of LFLRA, founded 1844
[See article in The Operative, Dec. 28, 1844]
16. Articles about William Schouler's State Legislative Committee investigating workers complaints, worker reactions, testimony, and committee findings
[See Voice of Industry Nov. 28, '45; Sept. 18, April 24, Jan. 9, '46]
[See also Mass House Document No. 50 (1845) in Commons, et al. Documentary History 8: 134-138 and 148-151]

AREA 2.6: CONFLICT

EXHIBIT COMPONENTS

17. Addresses by LFLRA leaders
(See Voice of Industry, June 5, 1845)
18. Speeches from, articles about the 1846 Industrial Reform Lyceum
(See The Operative, Feb. 15, 1845)
(See also Vox Populi, March 13, 1846)
19. Correspondence expressing attitudes of mill agents toward labor organizers
(See Essex Company, Samuel Lawrence to Charles Storrow, March 6, 1847 (MS 306, MATH))
18. First issue of Voice of Industry, last issue of Lowell Offering

AREA 2.6.2: 1875 MULE SPINNERS' STRIKE

1. Company notice about mule spinners strike
Reproduction (MATH)
PIN - 2234
2. Petitions and proclamations of strikers
3. Management correspondence relating to technical improvements leading to the strike
4. Newspaper headlines, articles and ads illustrating workers' organizing efforts
5. Management correspondence about work force, 1867
Reproduction (LHS)
PIN - 820

AREA 2.6: CONFLICT

EXHIBIT COMPONENTS

6. National Cotton Mule Spinners Assoc. lithograph, ca 1890
Original (LNHP)
PIN - 2581

AREA 2.6.3: 1912 STRIKE

1. Interactive video element
2. Strike-related headlines
Reproduction
[See PINs - 290, 440]
3. Photographs of strikers
[See PINs - 237, 238, 239, 892]
4. Union leaflets, pins, banners, organizing posters
[See PIN - 4201]
5. Photographs of labor leaders
6. Announcement of pay raise to prevent strike
[See Lowell Sun, March 9, 1912]
7. Strike notification
8. Headlines from various newspapers showing different views,
including those of the radical papers
9. Announcements of lock-outs
10. Quotes from management about trying to keep workers divided
ethnically
[See documents from the Flather Collection listed below]

AREA 2.6: CONFLICT

EXHIBIT COMPONENTS

- a. Pamphlet, "Present Day Relations between the Foreign Born Operative and the Mill Management," 1912
 - b. Agent's report: Ethnic and Occupational Analysis, 1912
11. Progress reports submitted by each nationality to the IWW
 12. Announcements of daily IWW meetings
 13. Ads from storekeepers showing support for strikers
 14. Articles about meeting of mill agents in Boston
 15. Statement released by the President of the Lowell Manufacturing Association granting 10% increases
[See Lowell Sun April 13, 1912]
 16. Courier Citizen report on loss of profits to mill owners and stockholders at end of strike
[See Courier-Citizen, April 12, 1912]
 17. Labor Day Yearbook, 1913
Original (LNHP)
PIN - 2665

SECTION 2.7: FASCINATION WITH TECHNOLOGY

Thematic Labels 97

List of Exhibit Components 99

THE PROMISE OF TECHNOLOGY

The emergence of the textile industry in Lowell took place within the context of a larger technological and industrial revolution in America and Europe. Railroads, telegraphs, farm machines, steam engines, and a host of labor saving devices for the household appeared at virtually the same time as the Lowell mills. Machines and their products became pervasive in virtually all aspects of American life.

Proponents of this transformation claimed that technology would create a utopian life in this country. Increasingly Americans--most of whom embraced this dream--began to look to the future rather than the past as a model of the good life. At the same time, many age-old craft skills became obsolete as a consequence of industrial technology.

International fairs celebrated the wonders of technology. During the second half of the nineteenth century there were impressive Expositions in London, Paris, Philadelphia and Chicago which glorified the new world of technological progress. Large crowds came to see the promise of the future.

Although technology has indeed transformed the shape of American life, the utopian promise has not been fulfilled. The belief that a machine could create a perfect society now seems naive. In fact, some historians claim that even with hundreds of labor-saving machines in our homes, women today spend as much time doing housework as did their predecessors in the nineteenth century.

SCIENTIFIC MANAGEMENT

During the early twentieth century Americans enthusiastically began to apply "scientific" techniques to the management of work and people. In the factories of Lowell--and at other industrial sites--engineers were expected to redesign work stations and managers were put in charge of longterm planning and coordination. Workers were supposed to surrender their hard-won, everyday knowledge to the schemes of the experts.

Advocates of scientific management emphasized the importance of observation and record-keeping in places of work. They claimed that professional managers did not need technical ability to design a task. Rather managers needed the conceptual ability to plan and understand the entire process.

Frederick Taylor, the leading advocate of scientific management, maintained that professional managers were supposed to find the "one best way" to accomplish any job. After making this discovery, they were to train their workers accordingly. In effect, workers were expected to act like the machines they tended.

At the heart of this approach was a powerful belief in science, rationality, calculation, and control. In this spirit, Lowell managers hired several prominent consulting firms at the beginning of the twentieth century to study mill operations, markets, productivity, and business practices. Ironically, scientific management had little real impact on textile production on the factory floor.

AREA 2.7: FASCINATION WITH TECHNOLOGY

EXHIBIT COMPONENTS

1. Textile manufacturing-related innovations
 - a. Introduction of the Power Loom, by Nathan Appleton
Original (LNHP)
PIN - 2204
 - b. James Francis and turbines
 1. Illustration of Francis
Reproduction (LM)
PIN - 4114
 2. Journals describing turbines and spinning experiments
Reproduction (L&C)
PIN - 483
 3. Illustration of turbines
Reproduction
 4. Hydropower experiments
Reproduction (U/Lowell, L&C, MATH)
[See PINs - 682, 683, 1260, 4130]
 - c. Leather belting
 - d. Fire suppression systems
[See book, Slow Burning or Mill Construction. Insurance
Engineering Station Report, 1893 reprint; Flather Collection]
 - e. Model showing stop motion
 - f. Model or illustration of a high speed fly frame
 - g. Northrup battery

AREA 2.7: FASCINATION WITH TECHNOLOGY

EXHIBIT COMPONENTS

- h. Crompton & Knowles loom patent models
(from Worcester Historical Society)
 - i. Illustration of factories with smoke, after installation of
steam engine
 - j. Illustrations of the Lowell Machine Shop
Reproduction (LHS, MATH)
[See PINs - 391, 392, 393, 394, 1480]
(Also, colored engraving owned by (?) John Goodwin)
 - k. Lighting in the mill
 - l. Machinery circular advertising
Original (LNHP)
PIN - 2473
2. Lowell inventions
- a. Ayer's pill assembly factory
 - b. Patent medicines and tonics (such as Moxey)
 - c. Rubber heel
 - d. Patent applications from the Channing Whitaker collection
 - e. Soda fountain
 - f. Meig's gun patents and illustrations
 - g. Cotton batting and comforters
3. Representations of other significant inventions:
- a. Telephone

AREA 2.7: FASCINATION WITH TECHNOLOGY

EXHIBIT COMPONENTS

- b. Telegraph

- c. Railroad: locomotive parts and/or illustrations
Reproduction (Museum of the City of New York, National
Gallery of Art)
[See PINs - 1312, 1680]

- d. Steam-related inventions
 - 1. Corliss engine
Reproduction (Leslie's Illustrated History)
[See PIN - 1192]

 - 2. Steam engine parts or model
[Also see PIN - 1311]

 - 3. Steamship patent papers and illustrations
Reproduction (American Society of Mechanical Engineers)
[See PIN - 1374]

 - 4. Books on the use of steam
[See The Steam Boiler, and Use and Abuse of the Steam
Boiler, both by Stephen Roper, 1889; Flather Collection]

- e. Typewriter

- f. Radio

- g. Bessemer steel

- h. Trolleys

- i. Phonograph
Reproduction (Scientific American)
[See also PIN - 1308]

AREA 2.7: FASCINATION WITH TECHNOLOGY

EXHIBIT COMPONENTS

- j. Colt revolver
- k. Other power-related inventions

See books in Flather Collection, such as:

Compressed Air, 1897
The Transmission of Power by Compressed Air, 1890
"Description of a New Method of Transmitting Power by
Means of Wire Ropes"
Rope Driving
Transmission of Power by Wire Ropes. 1889

- 4. Illustrations or ads of domestic and other labor-saving devices
 - a. Sewing machine
Reproduction (Smithsonian, Library of Congress, Leslie's
Illustrated History)
[See PINs - 1299, 1353, 1686]
 - b. Washing machine
Reproduction (Eleutherian Mills Historical Library)
[See PINs - 1325, 1324]
 - c. Food canning
 - d. Refrigeration
 - e. Dish washer
[See PIN - 1323]
 - f. Carpet sweeper
[See PIN - 1327]
 - g. Cream separator

AREA 2.7: FASCINATION WITH TECHNOLOGY

EXHIBIT COMPONENTS

- h. Breakfast cereals
 - i. Combination labor-saving devices
[See PINs - 1332, 1693, 2619]
5. Illustrations of agricultural innovations
- a. Farm animal treadmill
 - b. Foot corn planter
[See PINs - 1345, 1344]
 - c. Model of the McCormick reaper
 - d. Lists showing diversity and great number of agriculture-related patents
6. Examples of the public nature of the fascination with technology
- a. Popular novels with utopian and anti-utopian ideas about technology
 - b. Illustration of the Crystal Palace and exhibition
Reproduction (Scientific American)
[See PIN - 1193]
 - c. Illustrations and/or souvenirs from the Centennial Exhibition
Reproduction (Philadelphia Museum of Art, Leslie's Illustrated History, Harper's Weekly)
[See PINs - 1194, 1196, 1198, 1201, 1380, 1675]
 - d. Tickets for the Columbian exposition
Original (Private Collection)
[See PIN 1899]

AREA 2.7: FASCINATION WITH TECHNOLOGY

EXHIBIT COMPONENTS

- e. Illustration of the patent office
Reproduction (NYPL)
[See PIN - 1202]
- f. Zany patent models and ad for model maker
[See PINs - 1321, 1335, 1343, 1357, 1376]
- g. Lists of patents from Scientific American
Reproduction (Scientific American)
[See PIN - 1315]

7. Scientific Management

a. Time-motion studies

[See also, Motion Study: A Method for Increasing the Efficiency of the Sorkman. by Frank B. Gilbreth, 1911; Flather Collection]

b. Taylorism books

Selections from the Flather Collection:

1. "A Piece-rate System," by Frederick W. Taylor, 1895
2. Shop Management, by Frederick W. Taylor, 1911
3. Some Efficiency Factors in an Engineering Business, by William Weir and J.R. Richmond, 1901
4. "Standardization as Applied to Scientific Office Management. . .," by William Henry Leffingwell, n.d.
5. "The Fundamentals of Scientific Office Management," by William Henry Leffingwell, 1929
6. Installing Efficiency Methods, by C.E. Knoeppel, 1915
7. Methods of Cost Finding in Cotton Mills, by William G. Nichols, 1900

SECTION 2.8: WORK PRODUCTS

Thematic Labels.....	106
List of Exhibit Components.....	107

PRODUCTS AND MARKETS

Lowell mills, when they were established during the first half of the nineteenth century, had a limited product line. They specialized in plain goods made of coarse yarn. The entire Boott Cotton Mills, for example, manufactured only three kinds of cloth during the late 1830s.

Because most of the Lowell factories were owned by the same small group of Boston capitalists, owners coordinated product lines so they would avoid competing with each others and themselves.

During Lowell's early years the mill owners almost monopolized the American market. Their goods were sent South to clothe the slaves and west to meet the needs of Americans living on the frontier. Fine or fancy cloth was not part of the Lowell product line: such goods required skilled labor and therefore were too expensive to make. Moreover, mills in Britain, Philadelphia, and Rhode Island were formidable competitors in these product lines.

By the Civil War era, Lowell factories no longer had an exclusive corner on the market for cheap cloth. Factories in Fall River, Manchester, Lawrence, and New Bedford competed with Lowell. After the Civil War, mills in Virginia, North Carolina, and other southern states entered the competition.

Lowell owners and managers had to change their product lines to meet the competition. During one six month period in 1904, for example, the Boott Mills produced 276 different styles or kinds of cloth. These goods--some of them fancy--were commissioned by selling houses with orders from New York fashion firms.

During the first half of the twentieth century, Lowell factories were at the mercy of a volatile market rather than in control of it. Their initial dominance of the marketplace had given way to small, spot orders, the whims of the fashion industry, and the challenge of new competitors.

AREA 2.8: WORK PRODUCTS

EXHIBIT COMPONENTS

1. Bolts of cloth showing a range of products, 1830s-1950
2. Print and sample books
Original (LNHP, LM, MATH)
[See PINs - 514, 515, 516, 517, 518, 519, 520, 644, 645, 646, 648, 649, 650, 651, 655, 656, 658, 659, 1641, 1642, 2791]

[See also illustrations of printing, PINs - 400, 401]
3. Products
 - a. Slave clothing (negro cloth)
 - b. Printed cloth
[See PIN - 1532]
[See also dress made by mill girl, owned by LHS]
 - c. Soldiers' uniforms
 - d. Store-bought clothing
 - e. Towels
Original (LNHP, MATH)
[See PINs - 2, 1757, 1924, 1932, 2196, 2198, 2213, 2470, 2366]
 - f. Curtains
Original (LNHP)
[See PIN - 1923]

AREA 2.8: WORK PRODUCTS

EXHIBIT COMPONENTS

- g. Samples
Original (LM, NMAH, MATH, LHS)
[See PINs - 1, 488, 489, 647, 652, 653, 654, 657, 815, 853, 854, 880, 2194, 2199, 2215]

[See also samples in Flather Collection]
- h. Photographs of Victorian room interiors emphasizing the use of chintz
- i. Other products
Original (LNHP, LHS, Private Collection)
[See PINs - 380, 639, 2201, 2471, 2585]
- 4. Labels
Original and Reproduction (MATH, LNHP, AAS, LM)
[See PINs - 512, 513, 2293, 2295, 2620, 3197, 4104, 3193, 3196, 3194, 3195, 3186, 3198, 3199, 4102, 3188, 3178]
- 5. Textile industry and product ads
Reproduction (Lowell Directory, LM, U/Lowell)
[See PINs - 33, 34, 393, 394, 395, 396, 397, 398, 399, 980, 2798, 3150, 3176, 3191, 3190, 3192, 3167]
- 6. Fashion ads
- 7. Ads in foreign trade publications
- 8. Photograph of textile trade show
PINs - 1907, 3181, 3182, 3183
- 9. Graphic illustration of changing levels of production and changing variety of products over time

AREA 2.8: WORK PRODUCTS

EXHIBIT COMPONENTS

Reproduction (U/Lowell, LHS)

[See PINs - 457, 458, 459, 460, 466, 467]

(See also documents from the Flather Collection listed below)

- a. Graphs showing selling price of goods, 1920-1945
- b. Style history sheets, 1920-1954
- c. Sales record by style, ca. 1913

SECTION 2.9: CUT THROUGH

List of Exhibit Components 111

AREA 2.9: CUT-THROUGH

EXHIBIT COMPONENTS

1. Large graphic image of mill workers
2. Samples of weave room products
(Originals, or perhaps samples of the cloth being woven in the weave room)
3. Photographs showing decline of mills, 1920s-1930s
PINs - 209, 211, 341, 342

SECTION 2.10: DECLINE

Schematic Treatment 113

Thematic Labels. 114

List of Exhibit Components 115

**SCHEMATIC TREATMENT:
THE DECLINE OF THE TEXTILE INDUSTRY IN LOWELL**

On a large video screen in the vacant mill setting, visitors will see an oral history presentation--interspersed with historic photographs--in which residents of Lowell relate their experiences during the declining days of the textile industry in town. Workers will talk about being thrown out of work and looking for new jobs; former owners and managers will discuss company decisions, southern competition, and labor considerations.

Viewers will learn about the ways in which "bottom line" business decisions affect people's lives and how workers and their families managed to survive in hard times.

DECLINE

In the face of increased competition from new Southern cotton mills, owners of the Boott Mills asked William Parker, a textile consultant from Lawrence, Massachusetts, to prepare an in-depth analysis of their facility, operations and options in 1904.

Parker's report was a frank document. He claimed that the Boott was producing too many different kinds of products, that its machinery was outmoded, and that the arrangement of equipment in the factory needed to be completely reorganized. Most importantly, he declared that the buildings themselves were unsafe and out of date. He therefore suggested that the entire complex be razed and a new mill constructed on this site.

Owners of the Boott Mill--and other Lowell mills--did not pursue Parker's advice. Rather they decided to maximize short-term profits, keep wages low, and invest as little as possible in local facilities. Some owners began to put their money into new Southern mills where they found handsome tax breaks, cheap labor, few regulations, and modern plants.

Within a few years the consequences of this policy became apparent to the people of Lowell. Several Lowell mills closed down during the first three decades of the twentieth century. By 1940 only the Boott, the Merrimack and the Lawrence mills--three of the original eleven which had given Lowell its world-wide reputation--remained in operation.

After World War II the situation worsened. In 1956, the Boott shut its doors. Today, none of the original Lowell textile mills are in operation. A boomtown in the first part of the nineteenth century, Lowell was a community with vast amounts of abandoned mill space by the middle of the twentieth century.

AREA 2.10: DECLINE OF THE MILLS

EXHIBIT COMPONENTS

1. Audio-visual show
2. Storage boxes (to convey warehouse setting)
Reproduction
3. Signs: for sale, for rent, etc.
Reproduction
PIN - 4188
4. Memo to Boott employees about measures to save jobs
Original (Flather Collection)
PIN - 26
5. Notice to employees about Boott Mills' termination
Original (Flather Collection)
PIN - 32
6. Assignee's sale, Lowell Knitting Mills
Original (Private Collection)
PIN - 1539
7. Pamphlet, "Special Commission Relative to the Textile Industry
and to Prevent the Removal thereof from the Commonwealth,"
1950
Original (Flather Collection)

SECTION 2.11: LOWELL TODAY

Thematic Labels 117
List of Exhibit Components 119

RECOVERING A VISION

Today Lowell is undergoing an economic revival. In recent years the public and private sectors have joined forces to promote the community's economic potential.

Like Lowell's first boom, this second chance is the result of a clearly stated vision, conscious planning, private investment, and government support, and an available supply of labor. Lowell today also has a vast quantity of reuseable building space--the old mills--and several prominent educational institutions which have played significant roles in the revitalization.

Many people question whether the underpinnings of this new prosperity are well-founded and whether Lowell can serve as a model for other "rust-belt" communities in America. They also observe that the wealth of the community is unevenly distributed and that working conditions in some industries are not healthy.

Lowell remains a blue-collar town with a large industrial labor force. Small industries and large ones manufacture everything from car seat covers, telephone directories, stair treads, corugated cartons, jump ropes, and venetian blinds to boilers, church tapers, dog food, and underwear.

Lowell is also a center for the growing high-tech industry. Engineers, research scientists, skilled technicians, programmers, business managers, and immigrant laborers have come to Lowell to work in an industry which makes office computing machines, electronic equipment, computer software, and industrial robotics.

Similarly, many Lowell area firms contract with the United States Government, especially the Department of Defense. These companies manufacture guided missiles, space vehicles, and weapons systems.

Finally, Lowell has taken advantage of its special heritage to create state and national parks which attract visitors from around the world. Using old mills, boardinghouses, canals and railroad tracks, these government

agencies increase our awareness of both the past and present. They also contribute to the economic well-being of the community.

AREA 2.11: LOWELL TODAY

EXHIBIT COMPONENTS

1. Signs: Welcome to Lowell, etc. (1950s style)
Reproduction
2. Joan Fabrics
 - a. Finished car seats
Original
 - b. Bolt of cloth with quality control markings
Original
 - c. Photographs and/or film of the production process
3. Adaptive re-use of mills; photos of:

Boott Mills
Market Mills
Wannalancit Mills
Grace Shoe Factory

[See also PIN - 2463]
4. Wang
 - a. Exploded computer showing origins of parts required for
assembly
Original
 - b. Photographs of the production process
5. Images of high tech Lowell company logos, such as:

Ratheon
Digital
Honeywell
Data General

AREA 2.11: LOWELL TODAY

EXHIBIT COMPONENTS

(High tech logos, cont.)

Apollo

Pelon

6. Material on other businesses in Lowell, such as:

Courier Corp.

Prince Spaghetti

Scanell Boiler Works

Telephone directories

Stair treads

Corrugated cartons

Jump ropes

Venetian blinds

Church tapers

Dog food

Underwear

7. Stock market ticker (showing Wang stock??)

8. Graphic depiction of largest employers in Lowell

9. Photographs or logos from the state and national parks

SECTION 2.12: VISIONS FOR THE FUTURE

Schematic Treatment 122

Thematic Labels 124

List of Exhibit Components 125

SCHEMATIC TREATMENT:
VISIONS OF THE FUTURE

This program will employ state-of-the-art audio visual programming and equipment to explore future possibilities. By looking at the promise of the high-tech industry in our own day, visitors will get a sense of what the Industrial Revolution meant to ordinary Americans during the early part of the nineteenth century. In this way it will raise questions about the future and help visitors understand the past. The show will simultaneously be exciting and thought-provoking, giving visitors not only a look at some new horizons but also a feeling of *deja vu*.

The show will use a bank of video monitors and coordinated multi-image video programming. On the screens visitors will see:

- 1) Futuristic scenes from such classic American science fiction movies as *2001, Blade Runner, Star Wars*
- 2) The juxtaposition of Charlie Chaplin in the movie *Modern Times* with "Charlie Chaplin" in an IBM advertisement
- 3) Views of automated textile factories, print mills, warehouses, and automobile manufacturing plants
- 4) Demonstrations by robots
- 5) Interviews with theoreticians at MIT working on artificial intelligence, local labor leaders, staff from the University of Lowell's Center for Productivity Enhancement, politicians, high-tech entrepreneurs, educators, cultural commentators, and ordinary citizens

The entire show will last approximately five minutes. It will be very fast

paced, impressionistic, and it will raise substantial questions rather than provide simplistic or cliched conclusions.

PAST AND PRESENT

Echoes of the past can be heard in the present. Lowell in the late twentieth century--with its fast-paced economic growth, its enthusiastic embrace of new technologies, and its dependence on a few major industries--is strangely reminiscent of early nineteenth-century Lowell.

During the second quarter of the nineteenth century the textile industry radically changed this community. Today's rebirth is rooted in the innovative high tech industry. The people of Lowell again are playing a part in a new departure which is profoundly transforming everyday life in American society.

Many citizens of this city proclaim the birth of a new age. Others have been chastened by past experiences. They question how long glamorous new industries will remain here. They want to diversify the economic base of the community to avoid the pitfalls of previous eras. They want to develop an environmentally healthy community which promotes the well-being of a diverse population.

As in the past, the people of this city do not speak with a single voice. A wide range of interests exist in Lowell today--entrepreneurs, industrialists, government planners, university teachers, labor unions, ethnic organizations, professional associations, and religious groups.

The shape of the future remains in the hands of the people. Their efforts, choices, and decisions will determine the quality of life and labor in this community.

AREA 2.12: VISIONS FOR THE FUTURE

EXHIBIT COMPONENTS

1. Multi-screen video show
2. Video loop of fully automated textile mill today
3. Early throstle spinner
Original (LNHP)
PIN - 4350
4. Micro-electronic consumer goods
Original