REDEVELOPING Industrial Sites

A Guide for Architects, Planners, and Developers

CAROL BERENS

REDEVELOPMENT OF INDUSTRIAL SITES

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Carol Berens

JOHN WILEY & SONS, INC.

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Published by John Wiley & Sons, Inc., Hoboken, New Jersey.
Published simultaneously in Canada.

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Library of Congress Cataloging-in-Publication Data:

Berens, Carol.
Redevelopment of industrial sites : A Guide for Architects, Planners, and Developers / by Carol Berens.
p. cm.
Includes bibliographical references and index.
ISBN 978-0-470-39824-1 (cloth : alk. paper); 9780470649305 (ebk); 9780470649312 (ebk); 9780470649329 (ebk); 978-0-470-95017-3 (ebk); 978-0-470-95041-8 (ebk)
1. City planning–Case studies.
2. Industrial sites. I. Title. II. Title: Strategies for reclaiming the urban landscape.
NA9053.I53B47 2010
711′.5524–dc22
2010007961

Printed in the United States of America

10 9 8 7 6 5 4 3 2 1

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ACKNOWLEDGMENTS

Writing is said to be a solitary experience; however, writing a book requires the help and support of many people. For their encouragement, valuable comments and suggestions, I would like to thank Julie Pecheur, Judith Bing, Ellie Becker, and Tom Doramus. Jacqueline and Dick Loehr patiently listened to me and also trudged out to take some photos. Paula and Philip Forman were, as always, stalwart supporters, and Anne Asher, Patricia Zedalis and Michael Strasser continually encouraged me. My travels would have been much less enjoyable and productive if it weren't for the kind generosity of Diederik and Dana Advocaat in London and Bert and Malou Bakker in Amsterdam. In Paris, Patricia Bungener was always ready to set out to explore a new project. Patrick Weiller, Caroline and Jean-Francois Kindermans played hosts, guides, and translators in my journeys.

I greatly appreciate those who shared with me the details of their projects and the long paths to completion. Their recounting of the vagaries of the market, the endless public sessions, and the deadlines almost missed supplied invaluable information and conveyed the commitment required to undertake these projects. T. Allan Comp explained the complexities of establishing AMD&ART in Pennsylvania and the roles his impressive team played. Sarah Parker and Wendy Holmes of Artspace expressed their enthusiasm for and knowledge of creating artist housing. Tom Meyer and Jeff Scherer of Meyer, Scherer & Rockcastle, Ltd. outlined the perseverance required to sensitively renovate historic industrial structures to enhance today's use, while Ligeia Uker kindly endured my requests for images. John Grady at the Philadelphia Industrial Development Corporation explained the redevelopment process of converting a naval base to become a new part of its city. Anath Ranon of Cho Benn Holback + Associates Inc. patiently led me through the renovation of the flamboyant American Brewery building into a center for Humanim, and Henry E. Posko, Jr. and Cindy Plavier-Truitt of Humanim described the nail-biting experience of being first-time developers. Kara Cicchetti of the Architectural Heritage Foundation helped me understand how the renovation of the Washington Mills Building No. 1 was achieved. The enthusiastic recountings of Emma Keyte at Wilkinson Eyre Architects and Richard Bevins of the National Waterfront Museum in Swansea, Wales, made their project come alive. Aurèle Cardinal of the Groupe Cardinal Hardy explained how Montreal approaches redevelopment and the transformation of its waterfront, while Eve-Lyne Busque shepherded the images for me. The team at West 8—Adriaan Geuze, Jerry van Eyck, Nicolette Pot, and Dianne van

Essen—untangled the story of the redevelopment of Amsterdam's Eastern Harbor. Regina Meyer explained the massive rezoning process in Brooklyn, and Brian Coleman and Paul Parkhill of the Greenpoint Manufacturing and Design Center traced the history of their development efforts to protect industry in a corner of Brooklyn. Tim Jones of Artscape in Toronto shared the importance the support of art and artists to his city, and Liz Kohn helped greatly in finding the images to support that claim. Norman Hotson of Hotson Bakker Boniface Haden architects + urbanistes remembered how the design and planning ideas embodied in Granville Island were new and untested at the time and Noreen Taylor helped unearth some old images. Steve Soler of Georgetown Land Development Co., LLC explained how he worked with the local community to seek approvals. Scott Erdy from Erdy McHenry Architecture shared the urban vision of the developer of Piazza at Schmitds and Kristine Allouchery helped me with the images. Tom Ogara, a local developer, and Dan Reardon of the Trust for Architectural Easements walked me through a project that showed that it is as economical to renovate as to tear down.

In addition, I am indebted to all those individuals who went out of their way to help me with photographs and permissions: Dana Kelly of Bruner/Cott & Associates; the Mairie de Noisiel, France, and Nestlé France S.A.S.; Fiona Small of Urban Flash and Richard Cooper from Photoflex Studios; Lisa Ries from the Albert Kahn Family of Companies; Ellen Flanagan Kenny with Cummings Properties; Mikko Heikkinen of Heikkinen-Komonen Architects; Caroline Leroy at the Pavillon de l'Arsenal; Mathieu Génon at the ville de Nogent sur Marne; Stefania Canta at Renzo Piano Building Workshop; Timothy Sullivan at Design Collective, Inc; Iwan Baan and the Friends of the High Line; Paul Januszewski; Ronald L Glassman; Emily Winslow at Greenpoint Manufacturing and Design Center; Richard Johnson at the Torpedo Factory; Ron Solomon; Michael Van Valkenburgh and Adrienne Heflich from Michael Van Valkenburgh Associates, Inc.; Jeroen Hendriks of cepezed; Karen Utz at the Sloss Furnaces National Historic Landmark; Galia Solomonoff and Steven Harper of Solomonoff Architecture Studio; Andrew Zago and Laura Bouwman from Zago Architecture; Jo Oltman with Cambridge Seven Architects; Annie O'Neill; Brian Rose; Silke Schmidbartl at Latz + Partner; Shelley Seccombe; Lara Swimmer; Scott Fraser at Granville Island; Porter Gifford; Rob Watkins; Kevin Weber; Teresa Lundquist; Jill Slaight with the New-York Historical Society; and last but not least, Philippe Besnard.

INTRODUCTION

In New York City, along the Hudson River's edge where longshoremen once unloaded cargo and scows plied the waters, golfers now practice their drives and bikers cycle. In London, contemporary art hangs in a former power station. In Omaha, lofts and studios echo with the sounds of rock bands, not livestock. Throughout America and Europe, where smokestacks and warehouses once defined neighborhoods and even cities, today shade trees overhang park benches, museums attract streams of visitors, and new housing and office buildings bustle with activity.

For the last several decades, industry has been leaving the metropolitan centers of America and Europe in search of cheaper or more efficient places to produce goods. The swaths of derelict land and crumbling buildings left in its wake challenge architects, planners, politicians, and all those who are interested in the vitality of their cities. *Redevelopment of Industrial Sites* describes the strategies that cities, towns, and determined individuals have used to turn their formerly uninhabitable and economically bereft land and buildings into parks, cultural destinations, commercial complexes, and vibrant neighborhoods.

Headlines mourning industrial abandonment have an eerie similarity; stories of reinventions, too, though varied in design and use, are related in process and intent. These projects show how three powerful forces guiding development today—environmental concerns, renewed urban cores and historic preservation—work together to redefine the post-industrial city. The many successful strategies recounted in *Redevelopment of Industrial Sites* have entailed decades of effort, multitudes of consultants, and concerted political will, to say nothing of extensive financial resources.

* * *

Although the course of industry has never been static, after WWII the advent of multi-laned highways swept industries from densely developed cities toward more sparsely populated suburban and rural areas where new industrial facilities had acreage over which to spread out and easy transportation access via the new arterial networks. Container ships demanded deeper, more mechanized ports than the traditional harbor cities could provide. It became cheaper to manufacture goods beyond the shores of America and Europe for consumption at home. Industrial ruins soon pocked cityscapes. Abandoned buildings with broken windows sagged amid the weeds on their bleak, forlorn grounds. Rotting piers silently testified to the past dynamism of waterfronts. Cities, former economic powerhouses of production and

trade, reeled from these physical and financial blows. Cities, however, have proven more resilient than the naysayers' warnings.

Now there are decades-worth of achievements ranging from well-publicized projects to those only known by their neighbors. The problems and ultimate solutions of the often long and arduous development process are examined in this book. One of the puzzling questions that arose is determining how the redevelopment of industrial sites differs from the standard development project, if at all. The difference, however, isn't in process as much as in necessity. The vacant land and abandoned property of long-gone factories and failed projects stifle growth and effectively seal off sections of towns.

To look at some of the pioneering projects in the book is to see not only an apparently simpler era, but also to glimpse back at a time when economists and sociologists declared that "The City" was no longer a viable or even a necessary entity. Urban crime was rising, cities were going bankrupt, and urban investment evaporated. The uniform answer was to tear down what wasn't being used, a policy influenced by government funding. Urban renewal created new high-rise housing in low-rise neighborhoods or left parcels vacant when the money ran out.

Slowly, with the help of a few strong personalities, the post-industrial urban center was redefined. New York's artists rescued SoHo's nineteenth-century cast iron factories, and in so doing unwittingly created a new approach to economic development. Vancouver's Granville Island combined recreation, art, shopping, and industry to show that a layering of uses creates an active place people want to return to again and again. Paris turned industrial sites into parks in its eastern section to attract residents to formerly dreary neighborhoods. Baltimore's Inner Harbor brought people close to the waterfront.

While we may take these projects for granted today, they forecast differences in approach to urban redevelopment of their time and point the way to some of the large themes of successful conversions. Far from being the result of anonymous change, I was struck by how many projects were the visions of strong personalities who saw beauty and possibility where others saw deterioration and hopelessness. With every conversation I had with the people behind these developments, I was struck by how determined they were to achieve what they did, and that without this personal commitment and advocacy, these projects would not have gotten done.

The projects in the book were chosen for their transformative nature. Contrary to those in vibrant neighborhoods or exurban areas, these projects are critical to a city's financial health and urban fabric. Abandonment and ruin, often in strategic urban areas and comprising many acres, motivate the conversion of industrial sites. This is not an easy proposition, as these projects involve multiple layers not only of regulation and complicated financing, but also of history, emotion, and sometimes Byzantine land ownership patterns. These complexities lead to projects that entail government involvement as well as the cooperation of all development actors and can take years, even decades to complete. A long view and patience is required by all parties.

* * *

To look at these early projects and the more recent ones that have followed them, I've divided the book into three sections: A review of the industrial legacy, an overview of the redevelopment process and how it applies to industrial sites, and finally an examination of three broad project types—cultural, mixed-use, and parks and open space—and how they affect their cities.

The Industrial Legacy. Where industry settled and what kind of land it required play important roles in how these sites are redeveloped. Early industry needed water, either from the rivers or man-made canals and raceways, to power looms and other machinery. Cities developed around these economic generators as the workforce they attracted settled nearby. As a result, waterfronts in many industrial cites were inaccessible, reserved for working ports or factories. These areas now are in the greatest demand for recreation and residential use.

Industrial needs also spurred the development of new materials and building types for factories and the accommodation of machinery. The resulting spare forms of industrial buildings, their means of construction clearly expressed and not covered up, along with the prevalence of mass production of building elements greatly influenced

designers and theories of modern architecture. Years after function or market changes rendered these buildings obsolete for their original use, the simple, wide-open spaces of factories and warehouses with their exposed structures ignited the imagination of new generations, who since the 1960s have been rescuing these buildings. Although there are many reasons for the reuse of these buildings and sites, the allure of the industrial aesthetic cannot be dismissed, and in many instances, is crucial to the success of their redevelopment.

Redevelopment Overview. Another overriding theme that arose in conversations with developers, architects and project proponents is that development has become more complex and expensive since those first transformative projects. Some of the early actors look back and are amazed at how simple, at least in memory, the process was when they first started tackling reuse issues. While the process might have been easier, the concepts were novel, requiring innovative thinking.

Some of the programs that evolved in response to redevelopment issues have added numerous layers of approvals, and mechanisms such as tax credits, which may make these projects economically feasible, but at the cost of complicated financing requiring a roomful of consultants. The rise in public participation in the form of community meetings and forums, as well as the increase in the use of competitions and requests for proposals for both design and development schemes, has led to a greater transparency and control of local projects, but has also added various approval levels and subsequently time to the development process. How well this process is managed is a key to success or failure. This more open public outreach has given individuals who see a potential project a way to galvanize their neighbors and the government. It also presents the same tools to their opponents.

Often, cities evolve on their own while government policy plays catch-up, legitimizing what's already taken place without its prior approval. The initially illegal colonization of SoHo in New York City by artists has had an immeasurable effect on the economic development approaches of cities, to say nothing of zoning laws. Almost every hub city in America today has an arts or warehouse district. This "SoHo Effect"—both the spontaneous establishment of new neighborhoods "discovered" by artists as well as their dislocation because of the rise in value of the surrounding real estate—has molded public policy as well as methods to deal with it. Both Minneapolis's Artspace and Toronto's Artscape were established to provide affordable artist space so that artists wouldn't be pushed out and have since expanded their development mandate. Other cities have changed their zoning laws to allow live/work areas and artists overlay districts to encourage artists to settle there.

As beneficial as the arts economy may be for cities, encouraging it must be balanced with other public policy decisions that relate to the character of the post-industrial city. Not everyone can be an artist. When a factory leaves, it also abandons its employees. How does a city maintain its tax base and middle class and retain industry? Several cities have addressed this problem through zoning and special industrial areas, with varying success. Should the property remain zoned industrial or has the march of time made that futile? Questions of public policy infuse these projects that affect more than their neighborhood but the character of a town.

Two major environmental milestones have facilitated, and in the best cases normalized, the redevelopment of industrial sites. The first is that after several years of pilot projects in the mid-1990s, federal brownfield legislation addressed legal liability and cleanup issues directly. In general, subsequent owners of property on which others caused pollution are not liable if an analysis is done beforehand and an agreement concerning cleanup can be reached with the authorities. The federal government as well as the states have initiated programs for voluntary cleanups in order to make these properties useful again. Along with these policies are grants to do this initial due diligence.

The second is the rise in green building techniques, such as LEED certification, that encourage the redevelopment of existing sites. Former industrial sites often have easy pedestrian access to existing transportation compared to new buildings on a new sites outside a city. LEED certification also promotes the reuse of existing materials and structures. Ironically, while environmental concerns with respect to industrial sites can be daunting,

they're often more easily addressed than the larger issues such as retaining population, city identity, and finding a marketable use.

At one time, almost all projects were conventionally financed; however, it is striking how complex financing has become today. The days of the simple bank loan are past. Almost all projects now have multiple funding sources, many of which make the project feasible but also add complexity and lawyers' fees to the cost. The availability of tax credits for properties that are historical, old, or in underserved areas has had an inestimable effect on restoring industrial sites that fit in one of the allowable categories. Discussions of both environmental and financial aspects, however, are clouded by the variation in state and federal laws that are continually in flux as well as the ever-changing lending environment.

The increased role of not-for-profit groups in the redevelopment of industrial sites is noticeable. These groups, whether in the arts, social services or industry, are taking the initiative and becoming developers of their own projects. Rather than sitting back, they are building their own facilities. Groups with specific needs and outreach programs can use buildings that confound other developers. The Baltimore social service provider, Humanim, saw a building that stood vacant for over 30 years in an underserved neighborhood, undertook the renovation itself and invested the developer fee into the project. The Greenpoint Manufacturing and Design Center saw artisan manufacturing businesses squeezed out of their neighborhood in Brooklyn, struck a deal with the city to take over a rambling old rope factory, and became so good at what it does that it recently finished developing its fifth building. Stories of such not-for-profit group undertakings are scattered throughout the book and are an inspiration to those people and groups with little experience but a lot of drive.

Project Types. The projects in this book range from conversion of a small warehouse into a contemporary art gallery, to the remaking of the Amsterdam and London waterfronts, to the creation of a riverfront parks along the Hudson River in New York. Whether cultural, mixed-use or parks, change seldom comes quickly or without controversy. Some projects reflect investment spear-headed by government which is often the European model. Others are accomplished through collaborative efforts of government and private developer initiatives. In America, by far the most common story is that of a lone visionary or group of like-minded locals who see a rotting pier or an abandoned factory and then refuse to accept "no" as an answer in order to renovate it. From New York City to the small canal town, individual pioneers often initiate projects.

Two powerful economic development partners, art and tourism, often work together to rescue abandoned industrial buildings and sites and infuse life into moribund areas. Museums now operate in former mills, factories, and industrial wastelands in North Adams, Massachusetts; Tacoma, Washington; Minneapolis, Minnesota; and Swansea, Wales—just a few of the many cultural venues around the world that have pinned their hopes on being the key to their local and regional economic development renewal. Both large and small cities use their adaptive reuse projects—especially in the myriad mill museums that recount how things were made by the areas ancestors—to maintain a neighborhoods' sense of history in hopes of attracting visitors who will not only come for the exhibits, but remain to eat, shop, and perhaps stay overnight.

The large spans and raw spaces of these former industrial buildings are comfortable spaces for contemporary art, with its large sculptures that often don't fit into traditional museums. The unfinished surfaces of these converted buildings resemble artists' studios and are a perfect backdrop for this type of art.

Other cities pinning their hopes on creating tourist destinations opt for attention-getting structures that use their architecture as advertising. Merging the world of the culture and economic development, high-profile museums and cultural centers lure visitors to once run-down former industrial areas with attention-getting buildings. Because of the large areas and huge infrastructure investment required, these projects are almost always government-initiated with the costs and efforts justified by projected job generation and the economic benefit

gained through increased tourism and newly burnished image.

In America, the availability of land has traditionally fuelled growth, with companies and people accustomed to picking up stakes to start afresh in less populous or polluted areas. In Europe and more densely populated American areas where open space is scarce, the call for refurbishing blighted urban areas and existing underutilized facilities more easily resonates. In these areas, there may be a strong desire to restrict building and keep undeveloped land undeveloped.

The last half century saw people and resources move from cities to newly created suburbs and beyond, especially in America. While this outflow has not abated, the allure of urban living spurred in part by the revitalization of formerly undesirable areas that offer previously unavailable services and amenities now attracts the young as well as retains those with growing families. Projects are fueled in no small part by the revival in importance of urban public space. Not long ago, the urban landscape consisted of private spaces and often dangerous streets. With the rise of urban crime, the will to maintain or support public space diminished, or indeed was disparaged as an inappropriate public goal. The increased safety of certain cities coincided, and in some ways was due to, reclaiming the public realm for the public.

The mixed-use and parks projects address this American urban resurgence that has encouraged the market for redevelopment of industrial properties within its cities, making the real estate investment worth the risk. This turnaround has also left communities thirsting for more public space and amenities. The modern urban lifestyle now includes active outdoor pursuits such as biking and kayaking as well as visiting museums, shopping, strolling in parks, or eating at an outdoor café.

The fine line between neighborhood improvement and gentrification is a recurring theme heard throughout the planning and redevelopment process of these sites, both in America and Europe. With some exceptions, neighborhoods adjacent to these industrial sites fall into two large categories: Either they are the last refuge of affordable housing in their cities or they were severely underused and then unofficially homesteaded by a particular group such as artists or newly arrived immigrants. As houses, stores and parks replace boarded-up factories, existing nearby residents and businesses fear becoming strangers in their own neighborhoods, unable to afford or adapt to changes and concerned that future stores and services will appeal to a different class or group of people. There is no fixed response to this situation, whether based on an unspecified fear of change or deep-seated class antagonism or other concerns, as will be seen throughout the projects presented. Even though these issues arise time and time again, they must be addressed specifically with each project.

The large issues of deindustrialization and globalization are directly tackled on local levels as individual communities are left to deal with the effects of these macroeconomic issues. Often what appears to be a controversy over a specific development is at root an argument about the past and what used to be, not purely a fight over the future. The stage is set for conflict. Each project creates its own advocates and opponents—union workers pitted against nearby residents or newcomers versus long-timers, for example—that may not be obvious at the outset as each project confronts anew the fallout of sociological as well as economic change.

* * *

Until the late 1950s, packages for Uneeda Biscuits and Oreos, printed in a factory in Beacon, New York, were loaded onto trains and delivered to the Nabisco Bakeries on West 16th Street in New York City. Today, that bakery is the Chelsea Market, a rambling mixed-use food market and office building, that printing plant is the museum, Dia:Beacon, and part of that railroad is called the High Line, New York City's newest park. How these and other projects were accomplished are explored in this book.

SECTION 1

THE INDUSTRIAL LEGACY

CHAPTER 1

PATTERNS OF INDUSTRIAL SETTLEMENT

Industry Arrives

Starting with the first factories, facilities for manufacturing and distributing goods produced indelible marks on the physical layout and sociology of cities, and indeed countries. Although the whys and wherefores of the Industrial Revolution are complex and beyond the scope of this book, the changes wrought by this historical event shaped the built environment, influencing how and where cities developed. The story of the impact of industry's arrival and establishment can be read from their remains today—urban population concentrations, patterns of transportation networks, and the evocative ruins of factory and warehouse buildings. Industry's monopolization of urban waterfronts, the wide swaths of land consumed to accommodate machines and production, and the system of roads, canals, and rails over which supplies and finished merchandise flowed shaped and often created these cities.

For trading purposes, industry first settled where it had easy access to rivers and oceans. When manufacture was local and craft-based, port cities, traditional centers of activity, received raw materials and distributed products through cavernous warehouses situated directly on the harbor. As technology developed, especially in America and in Britain, industry claimed waterfronts in order to harness water power. Mills that produced cotton, paper, lumber, and flour, among other items, needed water for energy, superseding the men or animals who previously turned the wheels. Initially, the mills took advantage of naturally occurring waterfalls that produced energy to power their waterworks. Developments that manipulated and controlled nature for more energy and consistent results quickly followed, as waterways were dammed and raceways created in order to moderate the effects of drought and generate a constant flow of power throughout the seasons.

Cities developed around these economic generators as the workforce they attracted settled nearby. Several cities and regions claim the mantle of the birth of the Industrial Revolution as manufacturing developments happened quite rapidly and often simultaneously, imposing similar physical effects on landscape and urban developments. It is commonly agreed, however, that Great Britain forged an important lead in the advancement of manufacturing, fueled in large part by an effective merchant fleet, natural resources, and dense population centers. In addition to these advantageous factors, inventions for cotton spinning and the mechanisms to power them propelled Britain into the forefront of textile manufacture and the development of cities. Manchester, quickly

HIGHLIGHTS OF INDUSTRIAL DEVELOPMENT

1761	Bridgewater Canal built
1765	James Watt's patent of improved steam engine
1769	Richard Arkwright patented spinning yarn machine
1780s	Widespread use of steam power
1785	Edmund Cartwright's power loom
1791	*Panic of 1791*
1792	SUM and City of Paterson
1812+	Textile mills in Waltham
1819	*Panic of 1819*
1822	Lowell established
1825	Erie Canal opens Lachine Canal opens
1825	Menier factory in Noisiel built
1880s	Town of Pullman started
1902	Ebenezer Howard's *Garden City* plan published
1917	Tony Garnier's *Cite Industrielle* plan published
1955	Air Pollution Control Act
1956	Federal-Aid Highway Act of 1956
late 1950s–1960s	Rise of container shipping
1963	Rachel Carson's *Silent Spring*
1963 & 1970	Clean Air Acts
1972	Clean Water Act
1974	Love Canal evacuation
1982	Times Beach evacuation
1980	"Superfund" Act
mid-1990s	Brownfield pilot programs
2002	Brownfield Revitalization and Environmental Restoration Act

dubbed "Cottonopolis," is a good example of how technology and manufacturing transformed an area from a sleepy town to a major industrial hub.

In America as in Britain, textile production led the way and the textile mills of New England were the vanguards of industrial development. The rest of the country quickly followed, adapting the milling process as industrial and agricultural progress dictated. The natural landscape was transformed to accommodate industry's needs, and towns formed or grew exponentially in response to this rise in development. Social and physical changes occurred as towns expanded around these mills, thus enabling laborers to live close to the factories where they worked. Some enclaves were built by mill owners, who established company towns complete with workers' housing, stores, and community facilities, while others occurred naturally and incrementally. The first centers of American industry, however, were planned.[1]

Although New England became America's major mill center, the first industrial planned town was located further south, in New Jersey. As early as 1791, Alexander Hamilton and a group of investors founded the Society for Establishing Useful Manufactures (SUM). It was created to implement his Congressional *Report on Manufactures*, which stressed the importance of creating an independent American manufacturing capacity to establish economic autonomy from Britain. Its first and only industrial foray created Paterson, New Jersey, high above the 77-foot-high Great Falls of the Passaic River (Figure 1.1). In 1792, SUM purchased approximately six acres from three existing landowners and, supported by a charter from the New Jersey State legislature exempting it from local taxes, hired Pierre Charles L'Enfant, the architect of Washington, DC, to design the town and develop a means of controlling the water power to run mills. His plan was ultimately scrapped as too complicated and costly, but an alternate series of canals and raceways was built to provide water storage to ensure adequate and uniform water power to the cotton mills.

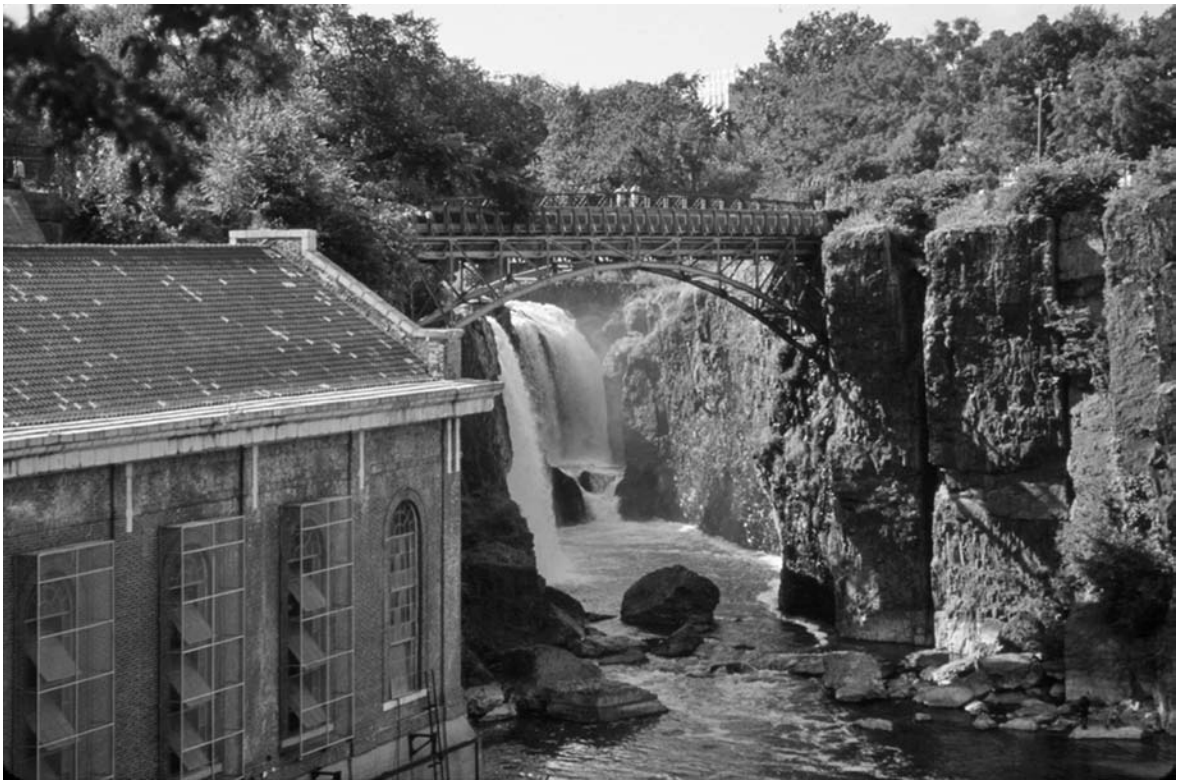

Figure 1.1
At 77 feet high and 280 feet wide, the powerful Paterson Falls on the Passaic River in Paterson, New Jersey, were a source of power for some of the first mills that were developed on the East Coast. The 1912 SUM Hydroelectric Plant is on the left.
Photo by Martha Cooper, 8/15/1994 Working in Paterson Project Collection (AFC 1995/028), Archive of Folk Culture, American Folklife Center Project, Library of Congress

SUM's life span as a producer of goods was cut short by overreaching and mismanagement. Although no longer engaged in manufacturing after 1796, it controlled the land and leased water rights. The number of mills grew, requiring new sites and a reworking of the raceway and reservoir system to keep pace with the expansion. By 1910, the existing power was inadequate and SUM built a central hydroelectric plant, employing Thomas Edison's Electric Company, and increased production to 6,500 horsepower. The city of Paterson bought SUM's business and holdings in 1946.

When SUM exited the manufacturing arena others stepped in, and factories producing paper, firearms, silk, railroad locomotives, and other items soon joined the original cotton mills. In the 1840s, Paterson started fabricating silk, and when high tariffs were placed on imported textiles after the Civil War, it became the center for the domestic manufacture of silk ribbons and cloth. By the late 1880s Paterson was responsible for about half

Figure 1.2
Essex Mills Building in 1973, built in 1870s in Paterson, New Jersey, shows the drop from the middle to lower raceway.
Historic American Engineering Record, NJ-2-9; HAER NJ, 16-PAT, 16, Jack Boucher, Photographer, 1973

the domestic production of silk, giving rise to its moniker, "Silk City."

Meanwhile, in Waltham, Massachusetts, in the years after the War of 1812, another textile manufacturing community started, taking advantage of the power of the Charles River and British textile advances brought back to America by Francis Cabot Lowell, who had toured the textile mills in England.

Although perhaps an urban legend, the establishment of the Industrial Revolution in America may also be one of the first instances of industrial espionage. During a tour of England, Lowell is said to have memorized the design of Edmund Cartwright's power loom and then recreated and refined it with the help of others in Waltham, thereby bringing the method of manufacture to America's shores. Not only did the owners build upon the progress and standardization of the British manufacturing system and maintain comparatively clean and organized mills, they established boarding houses for their workers, in this case almost

Figure 1.3
Waltham, Massachusetts' Boston Manufacturing Co. building as it looked in 1979 from across Moody Street dam. The 1814 wing is on the left, the 1816 mill is on the right, and the 1843 addition connects the two.
Historic American Engineering Record, MA-54-5; HAER MASS, 9-WALTH, 4-5, Steve Dunwell, 1979

all women, or "mill girls" as they were called. This housing was comparatively safe, but strict rules for living and conduct were enforced and boarding fees charged.

The practice of providing housing and services for workers near mills, thus creating an industrial district, became known as the "Waltham System." It became the "Lowell System" when the community moved to Lowell in 1822 to take advantage of the more powerful waters of the Merrimack River, which was harnessed through a series of canals and dams. At the time of the relocation, Lowell's population was small and agricultural,

Factory Girls

The story of working conditions, the rise of the labor movement, and the influx of immigration obviously parallels the story of the arrival and departure of mills and factories and the impact on urban development. Despite their importance, these subjects are beyond the scope of this book. From time to time, however, it is valuable to acknowledge the people behind the machines who made the goods and materials and who were responsible for the rise of industry. The history of the labor movement is rich in song, and sometimes the simple lyrics bemoaning workers' fates illustrate difficult lives better than text. For example, while owners claimed their provided housing was a service, having their lives ruled by the factory bell and expensive boarding fees made the workers' lot difficult. Perhaps the truth of the mill girls' lives can best be visualized in songs, which they sang while working because they could not be heard above the din of the machines. An example of one of the many songs, entitled, "Factory Girl" follows:

No more shall I work in the factory, greasy up my clothes;
No more shall I work in the factory with splinters in my toes.
Pity me, my darling, pity me I say;
Pity me my darling and carry me away.[2]

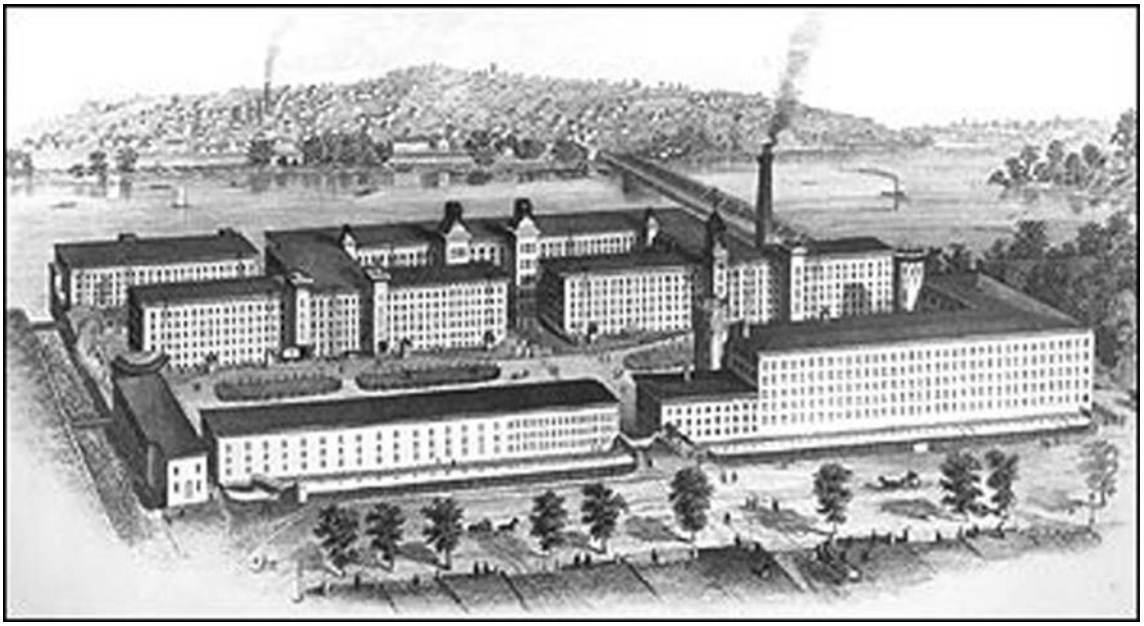

Figure 1.4
Lithograph of Boott Mills in Lowell, Massachusetts, shows the large mill complex sited against the Merrimack River. Many of the buildings have been converted to housing or are sites in the Lowell National Park (see Chapter 9).
Library of Congress, 1852

Figure 1.5
The design of this brick block on Dutton Street in Lowell, Massachusetts, is attributed to Kirk Boott and was one of the original boardinghouses built as part of the Merrimack Manufacturing Company (since demolished).
Historic American Building Survey MA-1151-1, Richard Graber Photographer, 1960s

and the boardinghouses and services were a recruitment tool to entice workers to this new area. The building of canals, whose owners leased water rights to the mills, also created a magnet for laborers, both from the northeast region and new immigrants, mostly from Ireland. Within 25 years, Lowell was the second-largest city in Massachusetts and America's largest industrial center. Its 5.6-mile-long canal system produced enough horsepower to support 40 mills. Not only were there over 10,000 workers in these mills, but they created the need for more support and other industrial developments as well as spurring the creation of other industries and putting Lowell at the front of industrial technology. In fact, Lowell is considered "the first major city in the United States designed and built for the needs of production."[3]

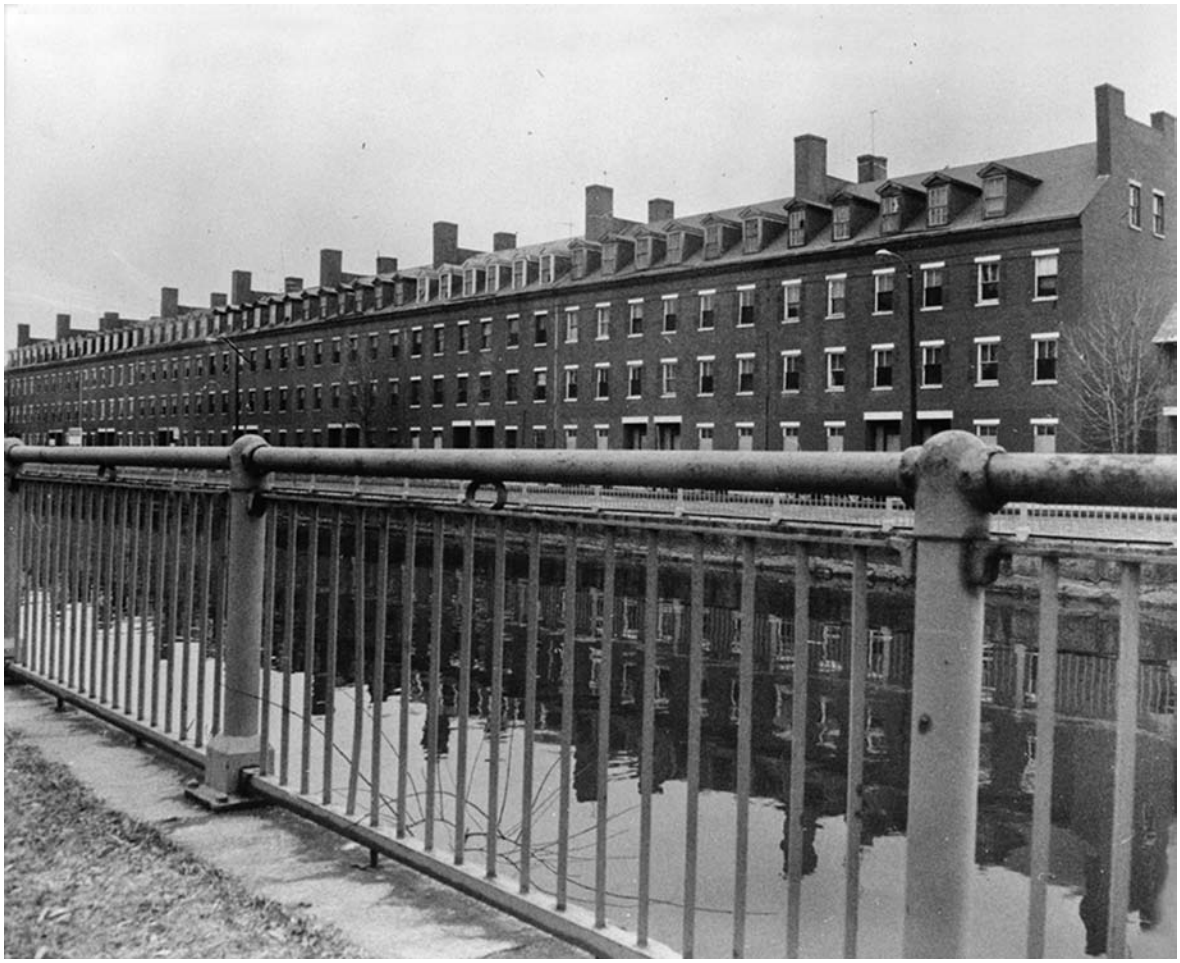

Figure 1.6
Slightly later version of the boardinghouses built in Lowell, Massachusetts, often sited near a canal or the river (circa 1840s; since demolished).
Historic American Building Survey MA-1153-2, Richard Graber Photographer, 1960s

The building of one or two mills was soon followed by other factories, making either the same or totally different goods. This was a pattern repeated throughout Europe and America. New factories tended to be built near each other, drawn by physical attributes such as a convenient energy source from a rapids-filled river, planned sites along man-made canals, conveniently located transportation, or the availability of a large number of factory workers, both skilled and unskilled. With each new factory more workers arrived, requiring places to live and shop, thereby fueling the development of industrial towns and cities. And thus the cycle repeated itself.

* * *

Figure 1.7
Worker housing in Pullman, formerly outside Chicago, Illinois, though plain, was sturdily built of brick and had cross-ventilation, gas service, and indoor plumbing among its amenities.
Historic American Building Survey IL-173-2, Jack E. Boucher, photographer, December 1977

In response to these changes to the environment and society, utopians and pragmatists, whether philosophers, ideologues, or factory owners, formed theories and established communities to address the location of industry in relation to other urban uses in order to provide a better life for workers and more "rational" cities. Many of these communities, including Lowell, not only aspired to the physical betterment of workers in terms of hygiene and education, but many also contained a moral component and a concern for propriety. The balance of work and leisure, as well as the contributions of workers to the industrial products, was the goal. Some also addressed the design of industrial buildings and physical layout of towns to accommodate workers and factories.

During the early 1880s, about 60 years after the city of Lowell was founded, George M. Pullman established his eponymous town in Pullman, Illinois, on approximately 4,000 acres about 13 miles south of Chicago. The town was built to support the factory that produced luxury sleeper railway carriages, with the expectation that quality housing, far from city pollution, would create a happy and productive workforce free from labor strife and agitation. Pullman was a planned industrial town, with factory buildings for manufacturing railway

Figure 1.8
Pullman, formerly outside of Chicago, Illinois, was a complete town that contained public buildings as well as factory and worker housing started in the 1880s. This is the Hotel Florence.
Historic American Building Survey IL-1018, Cervin Robinson, photographer, August 19, 1963 (ILL, 16-CHIG, 20-1)

cars using the steel of Chicago's mills, and also housing, public buildings such as a hotel, churches, schools, and parks. Meticulously planned by the architect Solon Beman (who designed all the 1,300 original buildings) and landscape architect Nathan Barret, the town plan was a grid with landscaped elements arranged throughout and provided for planted circles at some intersections, front yards, and tree-lined parkways, supplied by plants from its own greenhouse and nursery.

The more than 500 houses accommodated workers as well as professionals and company officers. Although designed in different styles to reflect class status as well as to lend visual variety to the streets, buildings were all constructed of brick and designed to have cross-ventilation, gas service, indoor toilets, and running water—a step above most worker housing of the day. Executive homes, located closest to the carriage plant, contained more ornament and detail than the plain worker houses.

Pullman expected the residents to be as fastidious as his town and controlled their lives by forbidding newspapers, speeches, and free public life. The town was maintained by the Pullman Company, which charged

Figure 1.9
Worker housing built by the Menier family in Noisiel, France, was part of a company town that included a town hall, school, and other public buildings that supported its chocolate factory. Photo circa 1900.
Collection Nestlé déposée en mairie de Noisiel. © Nestlé France et mairie de Noisiel

rent but also inspected homes and evicted renters for breaches of cleanliness. As a result of the Panic of 1893, business declined, and by the next year many employees were let go; however, their rents were not proportionately reduced. In an exemplification of the fact that architecture cannot trump sociology, the resulting Pullman Strike was a violent landmark in labor history; federal troops were brought in to break the strike because it disrupted rail and federal mail service. In 1898, the company town became part of the city of Chicago, when the Illinois Supreme Court ordered the Pullman Company to divest its ownership, a result of a commission's ruling after the strike that the town was "un-American."

In 1960, when Pullman was scheduled to be demolished for the construction of an industrial park, the Pullman Civic Organization formed to save the area. Subsequently, it became the Historic Pullman Foundation and has been working to restore the buildings and grounds and maintain public access. Pullman was designated a historic district by the National Park Service in 1970. It is now called the Pullman State Historic Site and the Illinois Historic Preservation Agency owns portions of the original Pullman factory, as well as the Hotel

Florence. Although the subject of continuing preservation and restoration work, people live there, some of whom are descendents of long-ago residents.

Europe also had planned industrial towns. When Menier Chocolate established itself in Noisiel, France, in 1825, it found itself in the same situation as the early Lowell factories. The town itself had few inhabitants, resulting in a labor shortage. Menier's solution was to create a workers' city—"a society of the future"—based upon progressive social ideals. Beginning in the 1870s, the Meniers launched an enclave complete with schools, library, stores, town hall (where a member of the Menier family would be mayor until 1959), and hotel. The public buildings were arranged around a central town square. Thirty years after its start, a home for retired workers was built. Soon, the company owned the whole town, and the Meniers considered their town the ideal workers' city and showcased it at the Universal Exposition of 1889 in Paris.

Brick housing was constructed along parallel streets, with the buildings staggered to allow as much air and light into the residences as possible. Approximately 300 houses were built, each containing two apartments with separate entrances, many with side and rear gardens. The wide tree-lined streets were lit by gas. Tenants were not allowed to purchase their houses, as Menier wanted to control their use for his factory workers. Rents, deducted from wages, were approximately 10 percent of the annual earnings of the heads of household. It was a paternalistic arrangement in which renters received free education for their children and free medical care, as well as access to public baths and entertainment venues.

In 1960, the housing was sold to a real estate developer, and today this former workers' housing is locally coveted houses. The European Route of Industrial Heritage considers it one of the best-preserved industrial communities in Europe.

The nineteenth century produced a hotbed of ideas and approaches to city planning and social theories aimed at taming the problems of industry's rise and saw no lack of utopian communities. Reacting to what was seen as the physical degradation of the land as factories encroached upon the rural landscape, these schemes also attempted to redistribute wealth and resources. The ideas behind Ebenezer Howard's Garden Cities and Tony Garnier's Cité Industrielle can been seen in today's concepts of zoning and city planning. That industrial areas are often set apart from the rest of their cities stems from these zoning approaches, and their integration into the urban fabric can be a major challenge to redevelopment.

The basis of Howard's idea of community control of land and profits was an attempt to integrate town and countryside, a method of controlling the movement of the urban, industrial population into the rest of the country. Dirty industry and overcrowded slums would be eliminated in these new cities, which were to be started from scratch. His 1902 *Garden Cities of Tomorrow* proposed towns built in concentric circles connected by axial roads. Public buildings and a commons were in the center, surrounded by grand avenues, housing, and industry. Farms were at the outer ring, a link to the untouched landscape. Residents would be assured of air and light and be close to work.[4]

Tony Garnier's Cité Industrielle, first exhibited in 1904 and later published in 1917, was a comprehensive proposal for the regulation of towns that clearly separated the city into areas reserved for work, living, traffic, and leisure, with each element isolated to allow for expansion. A green belt separated industry from the town. Garnier's town was sited on a river, the power source for a hydropower plant, and although connected by a railroad, the city was self-contained, the local economy capable of providing all. Garnier's Cité was a socialist haven; the public realm was responsible for the distribution of land, food, and necessities. There are great similarities between his plan and the workers cities such as Noisiel, specifically in the provision of housing and public facilities, such as schools and libraries, as well as the need for a river and rail transportation. Garnier's Cité was owned by the people, whereas workers cities were owned and controlled by industrial families.

Although neither of these plans was tested by reality, the ideas behind them periodically are revived and can