CHAPTER 4 *City Growth and Reform in the Nineteenth Century*

And did the Countenance Divine
Shine forth upon our clouded hills?
And was Jerusalem builded here
Among those dark Satanic mills?

— WILLIAM BLAKE, 1809

The modern industrial city came of age in Europe and North America over the course of the nineteenth century. The population and geographic size of the principal cities of industrial nations—London, Paris, Berlin, New York, Boston, and others—expanded at unprecedented rates with immigration from the countryside and from abroad. At the same time, small towns located near sources of water power or coalfields mushroomed into crowded "satanic" mill towns such as Manchester and Birmingham in England and Lowell, Massachusetts, and Scranton, Pennsylvania, in the United States. With rapid growth came a deluge of threats to life, health, and morality. In the early decades of the century, industrial tenements proliferated, sanitation collapsed, crime and disease flourished, and life expectancy declined. Gradually, the horrors of uncontrolled urbanization were recognized, at first by a few perceptive individuals and ultimately by a broader spectrum of society and its law-making bodies.

Fortunately, as cities expanded, so gradually did social capacity to equip and govern the modern city through innovation in such fields as civil engineering, social statistics, public health, finance, public administration, and landscape design. The primitive late medieval and colonial towns of 1800 became the nascent world cities of 1900.

Fundamental to the growing capacity to cope with urban problems were three primary avenues of reform that emerged in England, the European Continent, and the United States during that century of urban change:

1. *Regulation.* Beginning with the British Public Health Act of 1848, perception of squalor, overcrowding, and lack of basic sanitation yielded a series of public laws and regulations intended to gain some degree of control over the building of cities. These laws would lay an institutional foundation for the proliferation of land use and environmental regulations to appear in the twentieth century.
2. *Redevelopment.* Large cities underwent massive construction or modernization of urban infrastructure in the form of paved streets, lighting, water and sewer systems, urban drainage, mass transportation, schools, and urban parks. Such construction anticipated the urban redevelopment programs after World War II in Great Britain, the United States, and elsewhere.
3. *Relocation.* Late-nineteenth-century social reformers proposed encouraging people to move from overcrowded, unhealthy industrial cities to new model towns in outlying locations. These new towns were to be carefully planned, physically and socially, to uplift the spirit as well as to provide an honest living and healthful surroundings. Planned industrial towns, garden cities, and religious "New Jerusalems" that appeared between the 1830s and the early 1900s helped inspire large-scale "New Town" programs in many nations after World War II. They also contributed to the late Victorian ideal of suburban living that would metastasize into the vast metropolitan "nowheres" of today.

This chapter first summarizes the demographic and physical growth of cities and then considers these three fundamental avenues of urban reform in more detail. The stage will then be set for an overview of twentieth-century urbanization in the following two chapters.

Urban Growth during the Nineteenth Century

The increasing magnitude and concentration of manufacturing activities during the Industrial Revolution caused an astonishing increase in size and populations of cities in Europe and the United States during the nineteenth century (Table 4-1).

The growth of cities during that century was documented in 1899 by demographer Adna F. Weber in a study characterized in an anonymous preface as "the first really sound, comprehensive, and complete contribution to urban studies by an American" (1899/1963, 1). Weber identified three major elements of nineteenth-century urbanization: (1) the absolute and proportional increase of *urban population*; (2) the emergence of large numbers of *new urban places*; and (3) the phenomenal expansion of *very large cities* such as London, New York, and Paris. These elements are interrelated facets of the prevailing movement of people to urban places from the countryside and from other countries.

In England and Wales, large and small cities captured 80 percent of population growth between 1801 and 1891, and the urban proportion of the population grew from 16 percent to 53 percent. Urban places larger than 20,000 grew tenfold in total population from 1.5 million to 15.5 million (Weber 1899/1963, 43). In France, the number of people living in cities larger than 10,000 quadrupled from 2.6 million in 1801 to 9.9 million in 1891. The United States started the nineteenth century with a negligible urban population; by 1890, 18.2 million people lived in places

TABLE 4-1 NINETEENTH-CENTURY URBAN GROWTH: ENGLAND AND WALES, FRANCE, AND THE U.S.

YEAR	NUMBER OF CITIES	TOTAL URBAN POPULATION (MILLIONS)	PERCENT OF NATIONAL POPULATION
ENGLAND AND WALES: URBAN PLACES EXCEEDING 20,000 INHABITANTS			
1801	15	1.5	16%
1851	63	6.2	35%
1891	185	15.5	53%
FRANCE: URBAN PLACES EXCEEDING 10,000 INHABITANTS			
1801	90	2.6	9.5%
1851	165	5.1	14.4%
1891	232	9.9	25.9%
UNITED STATES: URBAN PLACES EXCEEDING 8,000 INHABITANTS			
1800	6	0.1	3.3%
1850	85	2.9	12.5%
1890	448	18.2	29.0%

SOURCE: Adapted from Weber (1899/1963).

exceeding 8,000, representing 29 percent of its population. (Urban population in the United States would exceed rural population by 1920.)

The shift of energy source from running water to coal, and later to electricity, facilitated the spread of manufacturing towns during the nineteenth century, resulting in the proliferation of new urban places. For instance, the number of towns with populations exceeding 8,000 in the United States rose from merely six in 1800 (Philadelphia, New York, Baltimore, Boston, Charleston, and Salem) to 448 in 1890.

Yet even though urbanization was spreading to smaller towns and cities in outlying locations, the principal cities nevertheless attracted the major share of population growth, largely due to immigration. London's population expanded sixfold to 5 million during the century. New York City grew tenfold from 1800 to 1850 and then tripled again in the next four decades, reflecting the arrival of large numbers of immigrants from Ireland and Continental Europe. (In 1898, New York rose to 7 million with the addition of Brooklyn, Queens, the Bronx, and Staten Island to form the five-borough New York City of today.) Boston grew from a modest town of 24,900 in 1800 to a world-class city of about 450,000 in 1890 (Weber 1899/1963, 450). Paris quadrupled from 547,000 in 1801 to 2.4 million in 1891, rising from 2 percent to more than 6 percent of the nation's population. Berlin grew

TABLE 4-2 GROWTH OF INDUSTRIAL AND DEVELOPING CITIES

(a) INDUSTRIAL CITIES GROWTH 1800–1890

CITY	1800	1850	1890	1850–90 ANNUAL GROWTH RATE
London	860,000	1.7 mill.	5 mill.	4.8%
Paris	547,000	1.0 mill.	2.4 mill.	3.5%
New York	62,500	660,000	2.7 mill.	7.7%%
Boston	25,000	137,000	448,500	5.6%

(b) DEVELOPING CITIES GROWTH 1950–2000

CITY	1950	2000	1850–90 ANNUAL GROWTH RATE
Tokyo	6.9 mill.	26.4 mill.	5.6%
Mexico City	3.1 mill.	18.1 mill.	9.6%
Jakarta	3.0 mill.	11.0 mill.	5.3%
Cairo	2.4 mill.	10.6 mill.	2.5%
Bombay	2.9 mill.	18.1 mill.	6.8%

SOURCES: Adapted from (a) Weber 1899/1963 and (b) *New York Times Almanac—2003*, p. 472.

from 201,000 to 1.6 million between 1819 and 1890. These rates of growth rival those of large cities in Africa, Asia, and Latin America in the late twentieth century (Table 4-2).

Public Regulation: From Sanitary Reform to Urban Planning

Urban Squalor

The building of dwellings to accommodate the astronomic increase in urban populations in the industrializing nations during the nineteenth century lagged far behind demand. Overcrowding to inhuman levels was ensured by the prevailing building practices of the times. Unfettered by any public regulations, tenement building was a joint result of the need for tenants to be within walking distance to factories and mills and the builder's greed for profit. Thus dwellings were minute in size and packed together with space left unbuilt only to the minimum extent necessary to provide physical access to each unit.

A prevalent building pattern in English industrial cities during the first half of the century was the "courtyard system." Dwellings were constructed facing streets with a second row, back to back with the first row, which faced only onto an interior courtyard or alley. Narrow tunnels connected these interior courts with the streets and outside world (Figure 4-1). In the absence of any means for removing sewage and refuse from the premises, the courts, alleys, and the streets served as waste receptacles. With sunlight and ventilation blocked out, the stench and health hazards were unimaginable (Figure 4-2).

The socialist reformer Friedrich Engels described Manchester, England, in 1845 as follows:

> Here one is in an almost undisguised working-man's quarter, for even the shops and beer-houses hardly take the trouble to exhibit the trifling degree of cleanliness. But all this is nothing in comparison with the courts and lanes which lie behind, to which access can be gained only through covered passages, in which no two human beings can pass at the same time. Of the irregular cramming together of dwellings which defy all rational plan, of the tangle in which they are crowded literally one upon the other, it is impossible to convey an idea. And it is not the buildings surviving from the old times of Manchester which are to blame for this; the confusion has only recently reached its height when every scrap of space left by the old way of building has been filled up and patched over until not a foot of land is left to be further occupied. . . . He who turns [into the maze of passageways and courts] gets into a filth and disgusting grime the equal of

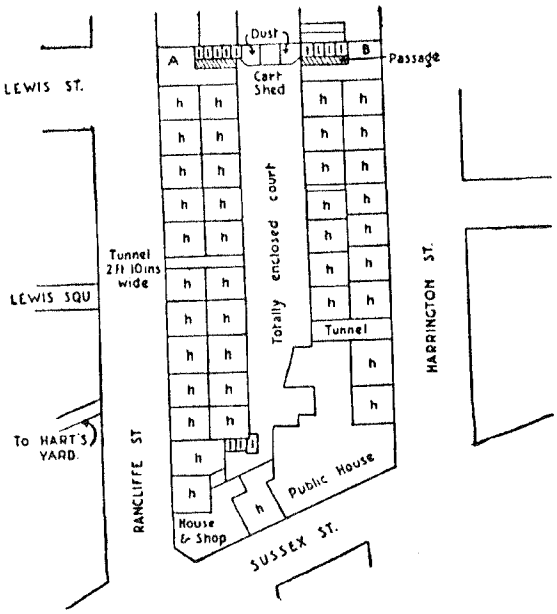

FIGURE 4-1
Diagram of tenement courtyard in Nottingham, England, circa 1840. *(Source: Benevolo 1967, Fig. 31.)*

HAS

DEATH

(IN A RAGE)

Been invited by the Commissioners of Common Sewers to take up his abode in Lambeth? or, from what other villanous cause proceeds the frightful Mortality by which we are surrounded?

In this Pest-House of the Metropolis, and disgrace to the Nation, the main thoroughfares are still without Common Sewers, although the Inhabitants have paid exorbitant Rates from time immemorial!!!

"O Heaven! that such companions thou'dst unfold.
"And put in every honest hand, a whip,
"To lash the rascals naked through the world."

Unless something be speedily done to allay the growing discontent of the people, retributive justice in her salutary vengeance will commence her operations with the *Lamp-Iron* and the *Halter*.

SALUS POPULI.

***Lambeth, August*, 1832.**

J. W. PEEL, Printer, 9, New Cut, Lambeth.

FIGURE 4-2
Broadside protesting inaction of improvement commissioners regarding sewerage, 1832. *(Source: Benevolo 1967, Fig. 30.)*

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> which is not to be found.... In one of these courts there stands directly at the entrance a privy without a door, so dirty that inhabitants can pass into and out of that court only by passing through foul pools of urine and excrement. Below it on the river there are several tanneries which fill the whole neighborhood with the stench of animal putrefaction. (Quoted in Benevolo 1967, 23)

Not only were the dwelling units pitifully small to begin with, but they were hopelessly overcrowded. Manchester in 1841 "had 1,500 cellars where three persons, 738 where four, and 281 where five slept in one bed" (Rosen 1958, 206), Liverpool, Bristol, Leeds, Glasgow, and London all contained sizable districts of similar nature. Liverpool in 1884 was reported to have certain districts with up to 1,210 persons per acre (Ashworth 1954, 10). In the United States, high-density tenement districts flourished in ports of entry for European immigrants. New York's Lower East Side had a density of 272 persons per acre in 1860, which doubled in the next thirty years as further waves of Irish and Italian immigrants arrived (Weber 1899/1963, 460).

courtyard in
l, circa 1840.
Fig. 31.)

Public Health Implications and Reforms

The pervasive overcrowding and absence of sanitation, potable water, fresh air, waste removal, and open space—combined with long working hours in unhealthy conditions—magnified human misery and shortened life expectancy. Tuberculosis (TB) or "consumption" was the leading cause of death in urban England during the nineteenth century. TB was inevitably associated with undernourishment, poor ventilation, and general debilitation (Flinn 1965, 11). TB, however, attracted little social consternation before the 1840s because it was viewed as an inevitable aspect of the working-class existence. Also, statistics on TB were unreliable due to the difficulty of diagnosing the disease and the absence of any governmental agency for collecting data on morbidity and mortality. As long as the elite were unthreatened by TB and its companion urban killer, typhus, nothing was done about it. (Perhaps Puccini in his 1895 opera *La Bohème* employed the death of Mimi to make the upper class more empathetic to the tragedy of TB.)

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Cholera was another story. This Asian import struck London in 1831–1832 and reappeared several times thereafter. In terms of numbers of deaths and chronic level of threat, cholera was far less important than TB or typhus. Its effects, however, were not confined to poor districts. Cholera struck with particular force in the wealthy neighborhoods where plumbing and connection to (polluted) central water supplies facilitated its spread. Together with a growing incidence of crime

against property, cholera galvanized consternation of the elite regarding the conditions of urban squalor in their midst: "Even if he were not his brother's keeper, every man of property was affected by the multiplication of thieves; everyone who valued his life felt it desirable not to have a mass of carriers of virulent diseases too close at hand" (Ashworth 1954, 47). And another pithy account:

> Cholera frightened people. It stirred even the moribund, degraded, unreformed municipal corporations into fits of unwonted sanitary activity. It was the clearest warning of the lethal propensities of the swollen towns of the new industrial era. (Flinn 1965, 8)

Cholera frightened the elite, but fear per se is a poor basis for public action. Converting fear into rational public response required not simply rhetoric but sound scientific investigation and documentation. The period between 1832 and 1860 marked the beginning of scientific sanitary surveys, which launched the modern public health movement (Rosen 1958, 213).

Besides the cholera scare, two other factors helped lay a foundation for sanitary reform. One was the development of the science of *statistics* and its application to the analysis of social problems. The first British Census was undertaken in 1801, partly to start a data base for the calculation of premiums for government-sponsored life insurance. The field of vital statistics was pioneered by William Farr, whose reports "provided the ammunition used in the campaigns against disease in the home, in the factory, and in the community as a whole" (Rosen 1958, 227).

The other factor was the appearance of a *liberal political philosophy* that urged government intervention to remedy social ills that impeded the economy. The necessary framework was provided by a small group of intellectuals headed by the energetic and enigmatic Jeremy Bentham (whose earthly remains dressed in his own clothes today reside in a hallway at University College, London). Among other reforms in the fields of law, education, and birth control, these reformers called for a review of the Poor Laws to centralize relief to the poor and to ensure that the system promoted rather than discouraged working for a living.

That the appointment of a Royal Poor Law Commission in 1832 would eventually lead to sanitary reform was in large part due to the driving force of a key individual: Edwin Chadwick. Like Robert Owen, Frederick Law Olmsted, and Ebenezer Howard, who are considered later in this chapter, Chadwick exemplified the nineteenth-century tradition of the inspired amateur. He would eventually be knighted for distinction in a field in which he had no formal training. Due to his association with Jeremy Bentham, Chadwick was appointed in 1832 as sec-

retary to the new Poor Law Commission where he remained until 1847. In this capacity, he began to study the causes of public outlays for "poor rates" (welfare payments), which inevitably led him to the long-ignored problem of slum housing. Assisted by three physicians, Chadwick prepared a report in 1838 that linked for the first time the incidence of disease fostered by unsanitary living conditions to the economic costs borne by the nation through the payment of "poor rates" (i.e., welfare payments).

This report was the first of a series of sanitary surveys that applied the new science of statistics to the analysis of patterns of illness and death. Essential to this task was a geographic perspective. With reasonably accurate vital statistics supplied by William Farr, the spatial patterns of disease could be mapped and related to environmental factors such as water supply. For example, there were two thousand deaths from cholera in 1854 in Newcastle-on-Tyne, while in Tynemouth, 8 miles away, where new drainage regulations were in force, only four deaths occurred (Ashworth 1954, 61).

The importance of Chadwick's work to sanitary reform, and ultimately city planning, can scarcely be overstated:

> The year 1838, then, was an important turning-point in the history of the public health movement. Although its roots stretch back fifty years, the movement was, before 1838, unorganized, leaderless, and in a legislative sense—the only sense that mattered in the long run—aimless. Essential foundations had been laid, preconditions established, but, important as these were, effective action was missing. This is what Chadwick supplied. (Rosen 1958, 35)

In 1842, Chadwick wrote another seminal report: *Concerning the Sanitary Condition of the Labouring Population of Great Britain.* It reflected a broad investigation of the incidence and causes of disease in poor districts, as well as Chadwick's personal reading of scientific literature on epidemiology and urban health. The 1842 report was graphic in describing the squalor prevailing in Great Britain's industrial towns. It helped lay a foundation for future work in urban sociology as well as public health. Like the commission convened by Charles II after the Great Fire of London, it resembled the modern "blue-ribbon commission" as a means to educate decision makers about a serious social problem.

Although it examined the social, health and moral effects of urban slum conditions in unprecedented detail, the 1842 report was hesitant to recommend stronger building laws, occupancy limits, mandatory ventilation and collection of wastes, and limits on the number of dwellings per unit of land. Such restrictions

on the private sector were still too controversial, and Chadwick evidently did not want to alienate his conservative audience by calling for governmental control of private land development. He did, however, perform a unique public service in documenting the nature, extent, causes, and economic implications of urban squalor.

In 1843, Parliament established a Royal Commission on the State of Large Towns and Populous Districts (Health of Towns Commission) to build on Chadwick's research and to propose necessary legislation. Chadwick wrote much of the commission's two reports in 1844 and 1845, including proposals to

- Delegate responsibility for sanitary regulation to local health authorities
- Prepare detailed sanitary surveys within a district before planning a drainage system
- Coordinate sewer construction with road improvements
- Establish minimum sanitary requirements for new dwellings
- Require ventilation and cleaning of existing dwellings
- Provide new public parks in industrial cities (Benevolo 1967, 91–93)

In 1848, faced with a new outbreak of cholera, Parliament finally adopted England's first comprehensive Public Health Act. This law was based on the 1845 Royal Commission Report that in turn drew heavily from the 1842 report, all drafted by Chadwick. Thus a major legislative reform was achieved in response to the perception of environmental threat documented in these and other investigative reports. Like the Act for Rebuilding London after the Great Fire of 1666, the 1848 Public Health Act demonstrated the capacity of the British legal system to respond (albeit belatedly) to the need for innovation in the face of disaster (Figure 4-3).

The 1848 act established a General Board of Health and authorized the creation of local district health boards. The latter, when locally established, were required to prepare "a map exhibiting a system of sewerage for effectually draining their district." Furthermore, new dwellings within health districts must be equipped with drains and a lavatory, a totally unprecedented public requirement. Other provisions dealt with refuse collection, removal of harmful wastes, inspection of slaughterhouses and lodging houses, the paving and upkeep of roads, the establishment of public gardens, water supply, and the burial of the dead (Benevolo 1967, 96–97).

It is of course one thing to pass a law, and another to bring about the physical changes desired:

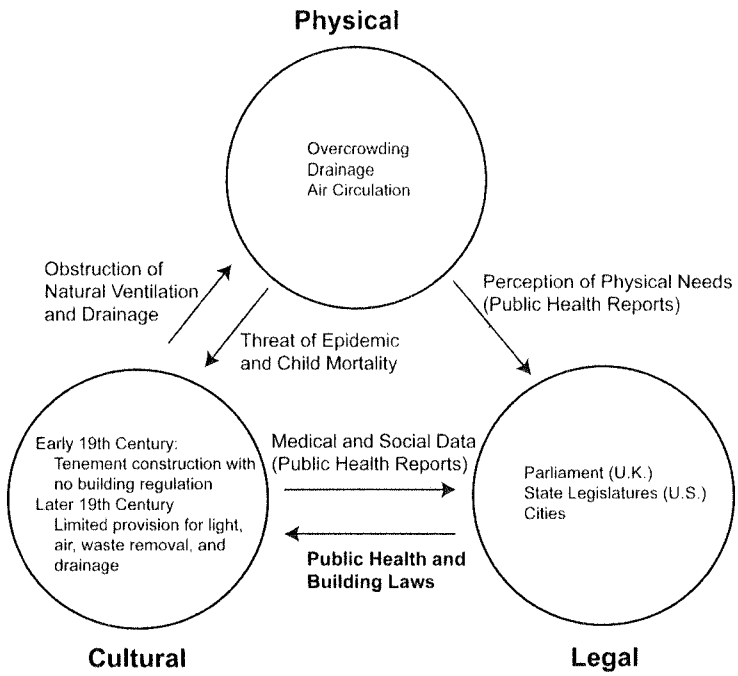

FIGURE 4-3 Land use and society model applied to nineteenth-century public health and sanitary reforms.

> The Act of 1848 constituted a tentative and uncertain start to govern action in a major field.... Nevertheless, it had put a foot through a door which had hitherto defied all attempt at opening, and although the detailed administrative arrangements it laid down were scrapped within half a dozen years, its principle of state responsibility was not discarded. It was this principle which the [1842] "Sanitary Report" had sought to establish. (Flinn 1965, 73)

Chadwick's work and the resulting 1848 Public Health Act inspired further reforms in Great Britain as reflected in subsequent laws adopted in 1875 and 1890. The English reforms were watched closely in Europe and influenced parallel efforts in the United States where industrialization and immigration were rapidly overcrowding cities along the Eastern seaboard. By midcentury, sanitary investigations inspired by Chadwick's work were under way in New York, Boston, and other cities, with new public health laws soon to follow. The New York (State) Metropolitan Health Act of 1866 was the first major law in the United States in this field. (The U.S. federal government would play no major role in urban environmental issues until a century later.)

The sanitary reforms of the mid-nineteenth century launched not only modern public health but also the field of city planning. Three major results of nineteenth-century sanitary investigations that underlie modern town planning were (1) construction of urban sewers (and later, sewage treatment plants); (2) sanitary survey planning; and (3) townsite consciousness, as reflected in the urban parks movement (Peterson 1983). Sanitary reform and the early public health laws evolved gradually into the urban planning movement of the early twentieth century. The conduct of sanitary surveys helped develop the methodology of general planning investigations. The surveys also elevated the geographic scale of investigation from selected neighborhoods or problem areas to entire cities and even metropolitan regions. Ultimately, building and public health legislation, primitive though it was, laid a constitutional foundation for the acceptance of broader land use zoning and environmental regulations in the twentieth century.

Redevelopment: A Century of Municipal Improvements

Advent of Public Responsibility

New public health and building laws of the second half of the nineteenth century, however well intended, largely applied to new construction and had little or no effect on the teeming slum districts already in existence. Thus when progressive urban reformers called attention to the squalid conditions, proposals for more drastic public action—tearing down the worst slums, in particular—began to be heard. One of the first of such projects took place in the notorious district of the Lower East Side of Manhattan where population densities reached hundreds of people (mostly recent immigrants) per acre. The crusading journalist Jacob Riis in 1890 published a landmark report, *How the Other Half Lives.* With camera, maps, and pungent prose, Riis documented the appalling conditions of New York's slums, including crime, debauchery, disease, and high rates of mortality as compared with other areas of the city. He described the immigrant district known locally as Five Points as the "wickedest of American slums" and the "foul core of New York's slums" (quoted in Page 1999, 73). A 3-acre site named Mulberry Bend near Five Corners was torn down by the city in 1896, a direct result of Riis's disclosures and the first of New York's slum clearance projects (Page 1999, 76).

Nonetheless, cities in the nineteenth century lacked legal authority, money, and experience in directly attacking the problems of existing slums. London, which had possessed a municipal charter of self-government since 1193, well into the

nineteenth century still lacked the authority or the will to provide basic urban services such as water supply, drainage, paving, and street lighting to most of its inhabitants. For those not fortunate enough to live in one of the privately planned estate developments, the haphazard activities of the local "improvement commissions" and a few widely ignored municipal regulations represented the extent of public interest in their welfare. Paris, which unlike London had not burned in recent history, remained medieval in its physical appearance and state of infrastructure.

Many of today's major parks and boulevards of European capitals originated as royal lands or were created by royal initiative. London's Hyde Park was a former royal hunting ground that was opened to public recreational use around 1640 (Rasmussen 1967, 92). The Champs-Élysées, the primary boulevard of Paris, originated in 1670 at the direction of Louis XIV. The two great Paris parks, Bois de Boulogne and Bois de Vincennes, originated as royal land that was replanned for more democratic uses in the 1850s at the instigation of Emperor Louis-Napoléon (Jordan 1995). Berlin's central park, the Tiergarten, was another former royal hunting ground, and that city's grand boulevard, the Unter den Linden, was laid out by Emperor Frederick William in the mid-seventeenth century (Abercrombie 1913, 222).

No such legacies of royal lands and patronage boosted U.S. cities into the modern era. City building in the United States, let alone the emergence of urban infrastructure and institutions, had scarcely begun in 1800. Urban historian Carl Bridenbaugh (1964) has documented the struggle of colonial towns to cope with chronic problems of water supply, fires, epidemics, and crime. Boston and New York, for instance, passed municipal laws during the seventeenth and eighteenth centuries requiring suitable construction and periodic inspection of chimneys. In the absence of a public fire department, each Boston householder was required to possess a bucket, ladder, and long-handled swab for extinguishing rooftop fires.

Necessary facilities in early American towns were usually provided through private initiative, often under a monopoly granted by the colonial legislature or municipal authorities. Boston's Mill Dam was constructed in the 1630s (at the present site of Government Center) by private citizens who leased sites for tidal-powered mills (Whitehill 1968, 5). The first bridge across the Charles River between Cambridge and Boston was privately constructed in 1768 under a law granting the builder a monopoly over river crossings, which was later rejected in a landmark court decision (Kutler 1971). Boston's first public water supply was established at Jamaica Pond by a private company in 1796.

The rapid demographic and spatial expansion of both European and American cities in the early nineteenth century rendered such *ad hoc* and profit-oriented solutions outmoded as responses to many urban needs. Although some services such as urban transportation, mills, and wharves continued to be provided through enfranchised private entrepreneurs, the urgent need to develop larger-scale facilities for common benefit such as water and sewer systems, parks, highways, and firefighting capabilities demanded that urban governments retool themselves, legally and technologically, to meet modern challenges. (Ironically, today some U.S. cities are reprivatizing their water and sewer systems, solid waste management, parks, libraries, and even schools.)

Transition in London: The Nash Improvements

To the delight of Anglophiles and the agony of traffic engineers, London historically has refused to be a planned city. From its 1666 Great Fire to the Nazi blitz of the 1940s, proposals for a sweeping redesign of the metropolis have failed to win popular support. Aside from the neoclassical geometry of the seventeenth- and eighteenth-century elite residential squares, the city as a whole has grown and evolved organically with a minimum of deliberate planning. One major exception to this history of incrementalism was the work of John Nash, the nineteenth-century successor to Christopher Wren as London's premier architect and planner:

> Once, and only once, has a great plan for London, affecting the development of the capital as a whole, been projected and carried to completion. This was the plan which constituted the "metropolitan improvements" of the Regency ... carried out under the presiding genius of John Nash. (Summerson 1962, 177)

Nash, born in 1752, was a prominent architect, society habitué, and close friend of the prince regent (who ruled England in place of his insane father George III from 1811 until the latter's death in 1820 and then in his own right as George IV until 1830). Nash was to be the leading architectural designer of "Regency London" whose works included Buckingham Palace and Trafalgar Square. Two legacies of this period were London's vast Regent's Park and the new Regent Street to connect the park to the center of the city. The program of urban improvement began in 1811 with the desire of the prince regent to develop a sizable tract of royal land at the northern edge of London known as Marylebone Park. This project was

intended not for the social betterment of the lower classes, but to create a new suburb for the aristocracy and also to enrich the royal household.

A major obstacle to this concept was the isolation of Marylebone Park from central London and the royal palaces, offices, banks, clubs, and "low-life districts" where upper-class gentlemen spent much of their time. As the selected architect for the project, John Nash proposed the construction of a brand new street from what would become Regent's Park to the center of London (Figure 4-4). For the park itself, he proposed to convert the site into a vast picturesque landscape, punctuated by opulent "terraces" of aristocratic townhouses. Nash also proposed the creation of Trafalgar Square (Figure 4-5), the redesign of several streets in its vicinity, and the construction of Regent's Canal to serve as a navigation artery and water source for the lake and fountains of Regent's Park (Summerson 1962, 177). Altogether, it was for London a program of unprecedented magnitude.

The importance of this vast undertaking as a transition between *royal* and *public* initiative is apparent in the contrast between the ends and the means involved. The Prince Regent made no secret of his wish to eclipse Napoléon as an imperial city builder and to enhance the royal household income, but he lacked the financial resources to accomplish the work, particularly to build Regent Street. To obtain an appropriation from Parliament, "there must have been some social aim in view, and the building of the new street was granted in 1813 as a means of improving the sanitation of the unhealthy quarters [along its route]" (Rasmussen 1967, 274).

The alignment of the new street was an early exercise of "scientific" city planning. The route traversed the western edge of the shabby and cheap districts of Soho, directly adjacent to the more opulent Mayfair neighborhood. Thus Nash as *planner* eliminated some run-down housing while acquiring the right-of-way as cheaply as possible. The alignment close to the best district of London ensured that the frontage of the new street would be developed for elegant homes and businesses. In Nash's own words, the new street would provide "a boundary and complete separation between the streets and squares occupied by the nobility and gentry, and the narrow streets and meaner houses occupied by mechanics and the trading part of the community" (quoted in Davis 1966, 66). Like the U.S. urban renewal program of the 1950s and 1960s, Nash's Regent's Park and Regent Street projects benefited the wealthy while purporting to upgrade the condition of the poor.

Eager to please his royal patron and potential investors, Nash as *architect*

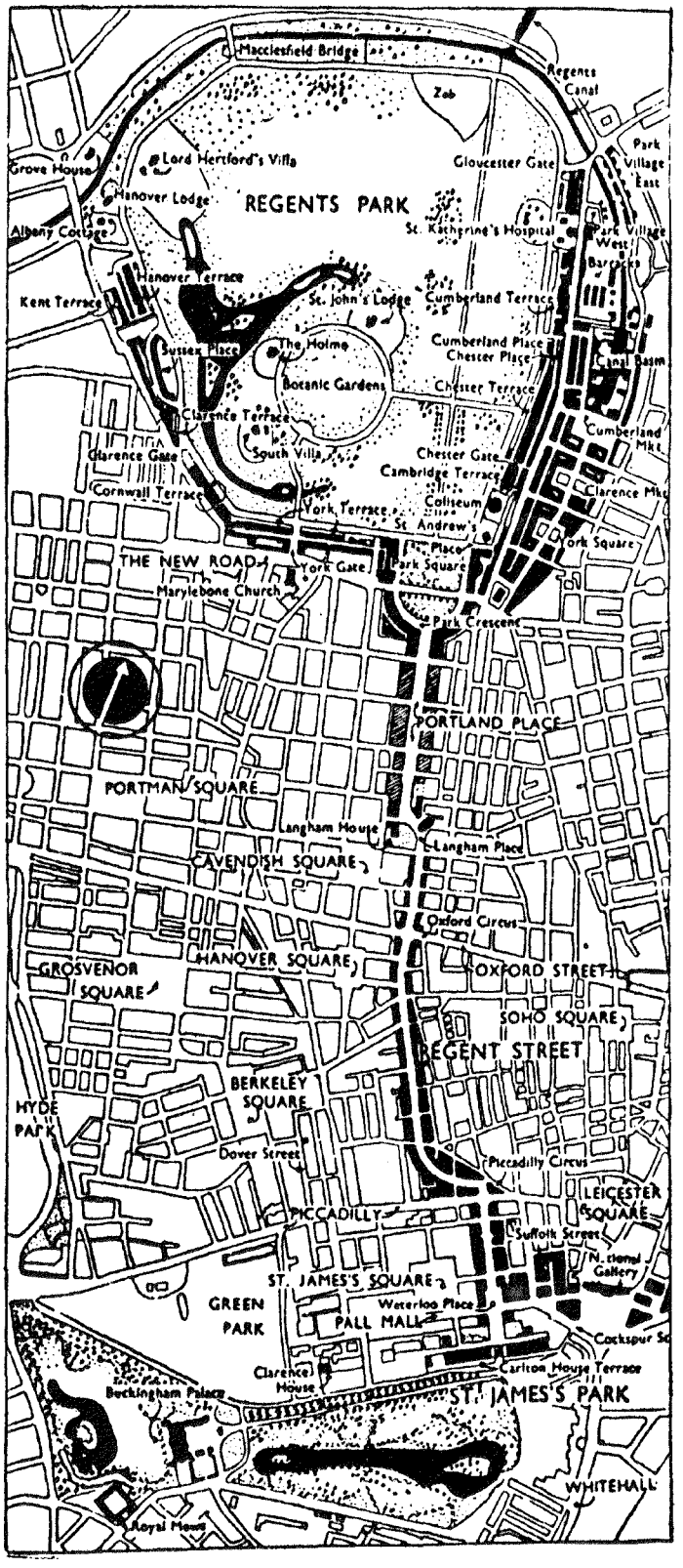

FIGURE 4-4
Regent's Park and Regent Street improvements in London designed by John Nash between 1812 and 1835. *(Source: Benevolo 1967, Fig. 13.)*

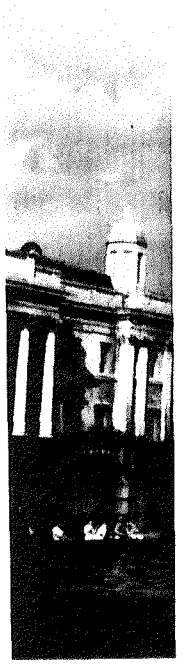

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FIGURE 4-5 John Nash's Trafalgar Square, London, 1830. *(Photo by author.)*

designed elegant neoclassic facades for his Regent's Park terraces and Regent Street frontage. Park Crescent, where Regent Street meets the park is a fine surviving example of "pure Nash," a curving, colonnaded exterior of creamy stucco. This stylish façade merges an entire row of townhouses into a continuous, majestic unity, resembling John Wood's earlier "Royal Crescent" in the city of Bath, England.

Finally, Nash as *landscape architect* achieved brilliance in the design of Regent's Park itself. There was nothing democratic about the initial plan for the park; in concept, it was simply a grandiose version of the West End squares laid out by landed aristocrats for their peers. The general public was not admitted to Regent's Park until 1838, and even then there was little to amuse the horseless working class (Chadwick, 1966, 32). Over time, however, Regent's Park evolved from a garden suburb for the wealthy to a public pleasure ground bordered by expensive townhouses. Today, Regent's Park is one of London's largest and most heavily used parks and contains, among other amenities, the London Zoo.

Nash was associated with two other park projects in central London, both designed to be public from the outset. One was St. James Park, a Crown property since the reign of Henry VIII, which Nash redesigned in 1828. It was open to the

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public but has remained crown property ever since (Chadwick 1966, 34). Trafalgar Square was, by contrast, public from the outset in both ownership and use (Figure 4-5). As London's equivalent to New York's Times Square, Trafalgar Square has always been the place for crowds to gather to protest governmental policies, to celebrate victories, or to welcome the New Year. That may not have been the intention of Nash, and certainly not of his royal patron, but in 1830, the latter died and the square opened, symbolizing the passing of royal privilege and the advent of planning for the people.

Haussmann's Transformation of Paris

The Nash "regency program" in London was but an appetizer to the banquet of urban and metropolitan improvements in Paris undertaken by Emperor Napoléon III and his technical administrator, Baron Georges-Eugène Haussmann. The rebuilding of Paris between 1853 and 1870, with work continuing until the outbreak of war in 1914, touched every inhabitant of Paris and its suburbs. It ingeniously blended the aesthetic with the functional. It pioneered new methods of finance and public administration. It converted Paris from an overcrowded, unhealthy medieval town into the fabled "City of Light."

The onset of comprehensive redevelopment of Paris coincided with the election of Louis-Napoléon as president of the Second French Republic after the Revolution of 1848. Returning from exile in England, this nephew of Napoléon Bonaparte immediately undertook to revive and continue the program of public works initiated in Paris by his uncle and carried on spasmodically thereafter. Perhaps influenced by the recent building of Regent Street and Regent's Park in London, Louis-Napoléon turned his attention first to the streets and parks of Paris. Following the coup d'état of 1851 and his assumption of the title of Emperor Napoléon III, in 1853 he selected Haussmann, then a rising lawyer and provincial administrator, to hold the office of "Prefect of the Seine":

> This was a very special post not only because the Seine was the richest and most densely populated Department in France, and Paris the hub of national political life, but also because on grounds of public policy, the Prefect of the Seine acted both as head of the Department and as municipal head of the city of Paris itself, two posts of immense influence and powers. (Chapman 1953, 179)

Haussmann's powers were civil and municipal in nature, not simply an extension of the Emperor whose authority was much diminished in comparison with

the earlier Napoléon. While Louis Napoléon strongly promoted the redevelopment of Paris, the actual program was a joint undertaking of the state, city, and private sector, utilizing essentially modern forms of legal procedures, financing, and contracting. Regal in scale and inspiration, the rebuilding of Paris was civic and bourgeois in execution.

Napoléon III's motives for undertaking the program are subject to debate. The conventional wisdom ascribes the laying-out of the great boulevards and plazas at their intersections (most notably the Place de l'Etoile) to military considerations, namely the need to protect the government against the socialist rabble who flourished in the twisted streets of Old Paris (Peets 1927). Certainly the revolutions of 1830 and 1848 may have influenced the Emperor's thinking, but great boulevards are two-way streets, as the Germans demonstrated in 1871 and 1940. A more humanitarian view is that Napoléon III understood the "sociological and hygienic condition of modern civilization [which]... forced upon him the sympathetic duty of making a suitable home for [his] people" (Smith 1907, 22). Another writer suggests three motives: (1) military considerations, (2) economic revitalization, and (3) "to make Paris into a capital city worthy of France, a capital provided with the light, beauty, and cleanliness essential to human dignity in cities" (Chapman 1953, 182).

Even before Haussmann arrived on the scene, his royal patron was already engaged in planning new avenues and redesigning Paris's great western park, the Bois de Boulogne. This area was a former royal hunting ground that the city of Paris took over from the Crown in 1848 on the understanding that the city would improve it as a public park: "The Emperor himself was vastly interested in the scheme, which he saw as a future rival to Hyde Park and the other royal parks of London which he had known earlier as a refugee in England" (Chadwick 1966, 153).

With the appointment of Haussmann in 1852, the urban rebuilding program began in earnest. Haussmann's first act was to order the preparation of an accurate survey of the city, using temporary timber towers to provide clear sight lines over the tops of buildings. The first phase of construction, approved by the legislature in 1855, involved new north-south and east-west avenues that followed the routes of the ancient Roman road crossing at the city's heart (Smith 1907, 25). The great boulevards laid out under this and later phases of work are the most familiar and cherished elements of post-Haussmann Paris (Jordan 1995) (Figure 4-6). Clearly inspired by neoclassical and baroque precedents, notably Louis XIV's Palace of Versailles, the Haussmann boulevards were widely acclaimed and set the style for ambitious cities around the world. For example, an ecstatic American architectural critic wrote in 1907:

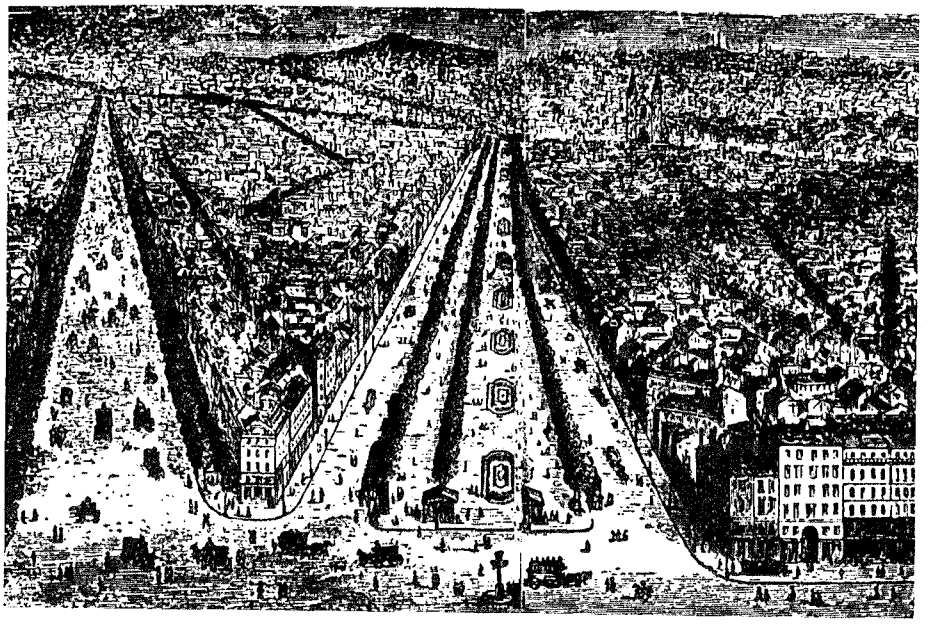

FIGURE 4-6 Bird's-eye view of two Haussmann boulevards, Paris, circa 1870s. *(Source: Benevolo 1967, Fig. 51.)*

> The *Avenue Napoléon,* now [Avenue] *de l'Opéra,* is a perfect modern French street; not too long, spacious, well-built and furnishing axial vista to a fine symmetrical monument. This is the culmination of the classic scheme of axial symmetry, conceived in the Hellenic period, more perfectly suggested in the Roman, carried a little farther in the Renaissance, fully understood by the Bourbon designers in France and brought to an ideal and complete realization by Haussmann in the Avenue de l'Opéra. (Smith 1907, 36)

To a greater extent than Regent Street in London, Haussmann's avenues and boulevards extended from point A to point B through whatever lay in their path. Not simply a widening of existing streets, these projects involved the acquisition, demolition, and replacement of the adjoining frontage on both sides of the new street. Today, the boulevards Sébastopol, de Saint-Michel, and de l'Opéra, among others, are broad, tree-lined avenues separated into through-traffic lanes, local-service access lanes, and broad pedestrian sidewalks, often clogged with parked motor scooters. The avenues are bordered by uniform facades of stylish, balconied *Second-Empire* buildings (Figure 4-7). Unlike West End London where residential districts are unsullied by shops, the frontage buildings in Paris have always been multipurpose. The ground floor is devoted to shops, cafés, banks, and restaurants; the next two or three floors contain elegant apartments for the upper middle class.

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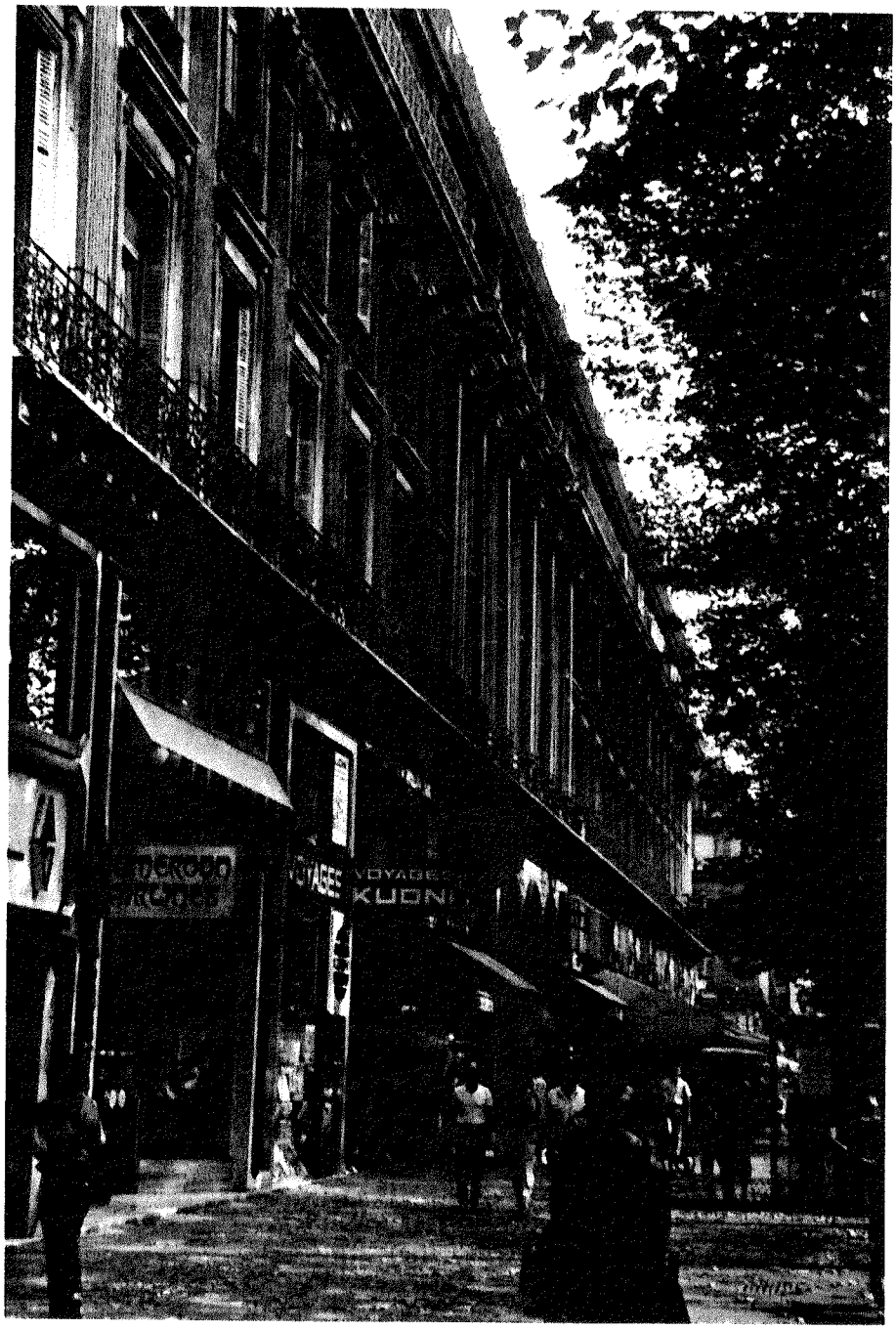


FIGURE 4-7 Street scene along a Haussmann Paris boulevard. *(Photo by author.)*

Above them, the attics beneath the mansard roofs contain artists' studios and garret rooms (possibly now converted to condominiums) (Saalman 1971, 26–27).

The frontage bordering the new avenues experienced a phenomenal increase in value as Haussmann expected. It was his hope that the city would retain ownership of the frontage and lease or sell it on the open market to capture the increase in value and thereby defray part of the cost of building the streets. This creative use of *excess condemnation,* however, was opposed by the financial community and was finally prohibited by the Council of State in 1858, which ordered that frontage lots, once cleared, should be returned to their previous owners (Benevolo 1967, 135–36). This promoted a lively speculation in land expected to be acquired for new streets. Construction of the new frontage buildings proceeded under private auspices but with uniformity of style ensured by a combination of public building restrictions and the aesthetic taste of the time. The construction of Back Bay in Boston at about the same time mimicked the legal and technical approach of Haussmann in Paris, but with a somewhat different architectural aesthetic.

The architectural critic Sigfried Giedion (1962) disliked the "great length" of Haussmann's boulevards, which he suggested were overly dominated by traffic concerns. But he praised the architectural treatment of the façades:

> Haussmann showed his sagacity in refusing to allow any tricks to be played with facades. Simply and without discussion, he spread a uniform facade over the whole of Paris. It featured high French windows, with accents provided by lines of cast-iron balconies like those used in the Rue de Rivoli under Napoleon I. He employed, unobtrusively, Renaissance shapes of a pleasantly neutral nature. A last touch of the unity which marked baroque architecture can still be felt. The neutral facades and the general uniformity make Haussmann's enormous work of rebuilding better than any other executed in or after the fifties of the nineteenth century. (Giedion 1962, 672)

Another Haussmann legacy was a new system of parks and open spaces in Paris. The smallest of these were carved out of the existing medieval clutter at the junctions of major streets. These green spaces have since provided oases of foliage, gardens, playgrounds, and park benches. Three larger parks and the gardens of the Champs-Élysées provide a middle scale of parks within the city. The regional parks of the Bois de Boulogne in the west and Bois de Vincennes in the east were elaborately redesigned to serve the well-to-do and the working-class populations of Paris on holidays. This three-tiered hierarchy of public open spaces qualifies Haussmann to be honored as "the creator of the first real urban park system" (Chadwick 1966, 152). Other Haussmann improvements included the markets of

Les Halles (since demolished for an underground shopping mall), the Opera, the completion of the Place de l'Etoile, several churches and theaters, major additions to the Louvre and Sorbonne University, hospitals, and schools Chapman 1953, 185).

In addition to these many visible embellishments of Paris, Haussmann oversaw the construction of critical infrastructure to improve the public health of Parisians. Between 1800 and 1850, the population inside the old Paris walls doubled from 547,000 to 1,170,000, while areas just outside the walls quadrupled. "The density of [the central core of Paris] was higher than on the lower East Side of New York in the 1930s" (Jordan 1995, 95):

> All the basic urban services collapsed under this burden. Water, sewers, hospitals, police, transportation, education, commerce—nothing functioned adequately. Pedestrians and carts could no longer use the same space.... Then came the ghastly cholera epidemics of 1832 and 1849. (Ibid.)

Like his counterparts in London and New York, Haussmann and Napoléon III sought to combat the public health menace through establishment of a regional water supply system to replace local wells, cisterns, and the foul Seine as water sources. And like Robert Moses, New York's legendary "power broker" of a later generation (Caro 1974), Haussmann was adroit at skirting the law to achieve his purpose: "He quietly went ahead with his plans for new aqueducts, his surveys, and the buying of sites, so that when finally permission was obtained he could immediately begin operations" (Chapman 1953, 186). By 1870, when both the emperor and Haussmann had departed from office, work was under way on two aqueducts to bring freshwater to Paris from the Aisne and Loire river basins, far from the city. (This project was in part influenced by New York City's new Croton River reservoir and aqueduct described later in this chapter.)

The other fundamental Haussmann contribution to public health was the Paris sewer system, a network of underground canals varying in width from 4 to 18 feet and totaling some 600 miles in length. Principal interceptor sewers and galleries were laid beneath the new avenues as those arteries were constructed (a practice more farsighted than was the case with most urban highway construction in the United States since World War II). The canals conducted street drainage and raw sewage to an underground reservoir beneath the Place de la Concorde from which it flowed to the Seine, a few miles downstream from the city (which polluted that river for the next century).

In terms of public works both seen and unseen, Paris was thus transformed during the period 1850–1870. Despite rancor over Haussmann's high-handed

financial schemes, work continued on many of his projects under subsequent governments until World War I. The result was a Paris transformed into the City of Light, flamboyant in style and functionally habitable:

> Haussmann's Paris was a city of luxury, commerce, banking, railroads, capitalism, government, administration, and pleasure, whether licit or illicit, popular or socially restricted. Its most obvious physical characteristic was the boulevard and movement. The wealthy and new west end dominated the older neighborhoods, and whatever the actual percentages of workers and artisans in the city, its overall flavor was bourgeois. Uniformity of scale and similarity of design proclaimed orderliness. (Jordan 1995, 163)

As important as the physical results of Haussmann's Improvements program, however, were its political and institutional innovations. The rebuilding of Paris was a unique, pathbreaking experience that bridged the gap between the cities of the eighteenth and twentieth centuries. Its legacies to modernizing cities elsewhere may be summarized under five headings: (1) aesthetic style, (2) functionalism, (3) metropolitanism, (4) finance, and (5) administration.

AESTHETICS

The architecture and plan of Haussmann's rebuilt Paris were widely celebrated as the ideal translation of classical and Renaissance principles into "modern" city planning (Smith 1907, 38). The broad boulevards terminating in monumental focal points, the small and large parks, the statuary and fountains, and the atmosphere of wealth and power all set the model for aspiring cities around the world. Paris was imitated in late-nineteenth-century redevelopment in Vienna, Berlin, Barcelona, London, Rome, Budapest, and many other European national and regional capitals. In the United States, Haussmann's design principals were imitated in the "city beautiful" movement, beginning with the 1893 Chicago World's Fair. Daniel H. Burnham, the principal architect of the fair, also drew on Haussmann precedents profusely in his 1902 plan for the Washington, D.C., park system and his 1909 *Plan of Chicago.* (See Chapter 5.)

FUNCTIONALISM

Less acclaimed than Haussmann's visible Paris improvements, a major contribution to modern city-building was his integration of urban infrastructure into the

process of redevelopment. Thus the "City of Light" also became the "City Functional." The impressive new avenues were pathways, not only for surface traffic, but also for sewers, gas mains, water conduits, and, by the end of the nineteenth century, subway tunnels and stations (Le Metro). All the elements of modern cities were addressed somewhere in Haussmann's plans: housing, communications, food, water, gas, sewerage, commerce, education, culture, recreation, hospitals, cemeteries. Haussmann thus was a towering figure in the development of modern city planning.

METROPOLITANISM

In two respects, Haussmann promoted a metropolitan or regional approach to urban governance. The first was his development of regional water, sewer, and later transportation systems serving Paris and some of its suburbs. The other was his successful effort to expand the city geographically by annexing surrounding neighborhoods just outside the old city walls. In 1859, eleven communes containing some 400,000 inhabitants (many living in industrial tenements) were legally annexed to Paris, yielding its present territory. The annexed neighborhoods then had to pay taxes to the city but in turn received urban public services. Similar enlargements of municipal territories occurred in London in 1888, in New York City in 1898, and in Berlin in 1923. In the twentieth century, however, annexations to central cities tapered off as metropolitan systems to provide water and other services to both central cities and suburbs became widespread.

FINANCE

A fourth Haussmann legacy was his development of modern fiscal approaches to urban redevelopment. About two-thirds of the total cost of improvements under his direction was derived from national and municipal grants and the sale of public lands. The municipal contribution was facilitated by the significant rise in tax revenues attributable to the improvements themselves. The remaining one-third was financed through borrowing from private banks and other lenders. This "deficit financing," so familiar today, was novel and controversial in Haussmann's time. His optimistic expectations were proven accurate, however, and the loans were repaid (Chapman and Chapman 1957, 236–37).

ADMINISTRATION

Finally, the Haussmann era marked an administrative revolution, the advent of the modern technocrat. With objectives established by higher authority—emperor, state council, or city council—it was Haussmann's role to carry out the will of his superiors:

> Precisely because he did have the Emperor's support, Haussmann was always able to avoid having to justify his actions politically and could present them as technical and administrative measures deriving from objective necessities.... Haussmann set the pattern for the town-planner as a specialist worker who declines all responsibility for initial choice, and therefore in practice for the town-planner who is at the service of the new ruling class. (Benevolo 1967, 134)

The transformation of Paris under Haussmann's direction was unparalleled in world history, apart from rebuilding after war or natural disaster. Haussmann's closest twentieth-century counterpart was New York's Robert Moses (Caro 1974). Although Haussmann's program was high-handed, expensive, elitist, and unpopular at the time with many Parisians, it created one of the world's most elegant, beloved, and (in the absence of war damage) enduring monuments of neobaroque city planning. Post-Haussmann Paris was a unique blend of the human and the majestic. On the one hand, its alleys, garrets, cafés, and universities nurtured literary and artistic exuberance—the Paris of Renoir, Monet, Stein, Fitzgerald, and Hemingway. On the other hand, it served as exemplar of the baroque world capital with its boulevards, parks, museums, and visions of grandeur. And beneath it all lay the sinews of a modern metropolis.

Water Supply for New York and Boston

Urban communities in the United States in 1800 were few in number, small in size, and coastal in location. The colonial period left each of these settlements with a primitive preindustrial infrastructure, including streets (mostly crooked and unpaved), docks, a town meeting hall, some common open spaces, firefighting implements, a constabulary and jail, and foul water supplies. As population growth began to soar in the early decades of the eighteenth century, the inadequacy of potable water was perceived to be the chief liability and limitation on urban health and prosperity.

The water problem for both New York and Boston was especially acute. Situ-

ated respectively on an island (Manhattan) and a peninsula (Shawmut), both cities were bordered by tidal, brackish water with no available freshwater streams. The citizens of each city were already dissatisfied with their existing sources in 1800. The water table aquifers on which they depended were easily contaminated with wastes from privies. Wells close to the shore could become brackish due to salt-water intrusion. In addition, with limited surface recharge of local groundwater, the reliable yield of springs and wells was insufficient. Rainwater cisterns added little to the general supply. By 1830, New York had grown to 200,000 inhabitants and Boston to more than 58,000. In that year, Thomas Crapper invented the flush toilet, and thenceforth water consumption per capita would rise rapidly as water-borne sewerage gradually replaced on-site privies and "night soil" collection (Weidner 1974, 55).

During the early decades of the nineteenth century, the provision of urban water supply was regarded as a private rather than a public function (Blake 1956, Chap. 4). New York, Boston, Baltimore, and several small towns relied initially on enfranchised private companies in preference to assuming the burden directly. An exception was Philadelphia, where recurrent outbreaks of yellow fever at the turn of the nineteenth century prompted a more aggressive municipal response. In 1801, Philadelphia constructed at public expense a pumping plant on the Schuylkill River powered by two steam engines. This project was designed and promoted by the noted engineer Benjamin Latrobe. It marked a dual breakthrough, first in *technology* (the use of the steam engine to pump water) and second *institutionally* (the use of public taxation to finance a municipal water supply) (Blake 1956, 33).

In Boston, the Jamaica Pond Aqueduct Company was chartered in 1796 to supply that town with water. It laid a 4-mile-long hollow-log pipe from Jamaica Pond in Roxbury (then an independent town) to Boston. This early example of an extraterritorial water supply, however, was inadequate for firefighting or to meet the needs of the growing Boston population (Nesson 1983, 1–2).

Similarly, in New York, the Manhattan Water Company was chartered in 1799 with an exclusive franchise to supply the city with water. It initially constructed a reservoir in lower Manhattan to supply 400 families from local groundwater: "But this water proved both scarce and bad; . . . and it was not long before the new works were voted a failure" (Booth 1860, 666). In 1811, a plan for the future expansion of New York was prepared by a special commission established by the state legislature. The "Commissioners' Plan" projected future streets marching miles into the countryside of upper Manhattan as far as "155th Street." The plan was an

accurate, if monotonous, forecast of the spatial growth of the city. The opening of the Erie Canal in 1825, which connected the Hudson River with the Great Lakes, established the city's economic preeminence in the nation and doubled its population to 200,000 in the decade 1820–1830. Local water sources were hopelessly inadequate to serve this rapidly growing population. Various schemes were debated fruitlessly.

Finally, catastrophes in the form of fires (1828 and 1835) and cholera (1832) forced an end to the dithering. Colonel DeWitt Clinton Jr. was retained by the city to assess the water crisis and propose a solution. His report predicted that Manhattan would reach a population of one million by 1890 (he was late by twelve years). His proposal was simple in concept and vast in magnitude, namely, to tap the Croton River 40 miles north of the city to obtain a reliable supply of 20 million gallons per day (gpd) of pure upland water. (Clinton assumed per capita demand of 20 gpd, not foreseeing the impact of the flush toilet.) The elevation of a Croton River reservoir at 200 feet above sea level would permit the water to flow by gravity through an aqueduct to be constructed with enough pressure to serve the needs of taller buildings and firefighting (Weidner 1974, 28–31).

The Croton River project required the construction of storage and conveyance facilities unprecedented since the Roman Empire. With the total cost estimated at several million dollars, the project was too large and too important for private enterprise. Accordingly, the city of New York, under authority from the state legislature, undertook to plan and execute the Croton River project directly. A water commission was quickly appointed, financing was approved by the city's voters in 1835, and construction began in 1837.

The project involved five major structural elements: (1) a masonry dam impounding a reservoir with a storage capacity of 600 million gallons; (2) a 40-mile-long covered masonry aqueduct to the city; (3) a 1,450-foot-long arched bridge to convey the aqueduct across the Harlem River into Manhattan; (4) a 35-acre receiving reservoir within what would become Central Park; and (5) a 4-acre, masonry-walled distributing reservoir located on the present site of the New York Public Library at Fifth Avenue and 42nd Street. The first Croton River water arrived in Manhattan on July 4, 1842, an event celebrated with church bells, cannon, and a 5-mile-long parade (Weidner 1974, 45–46).

Six years later, Boston would hold a similar celebration. In 1845, John Jervis, who directed the Croton River project and was "America's foremost water supply engineer" (Nesson 1983, 4), was hired to study Boston's water crisis. He recommended adoption of an earlier plan to create a water supply at Long Pond (later

Lake Cochituate) in Natick, 17 miles from Boston. The Massachusetts legislature in 1846 authorized the Long Pond project to be constructed by the city of Boston and provided state backing of municipal bonds to finance it (Nesson 1983, 9). The project was completed in two years and the westward march of Boston's quest for water was under way. By 1860, Boston was using the entire safe yield of that source. With legislative backing, the city developed a new reservoir in Chestnut Hill and six smaller reservoirs in the Sudbury River watershed to augment the Long Pond supply. By 1878, Boston had tripled its supply to about 63 million gpd.

These early water projects set the precedent for later expansions of the New York and Boston water systems extending farther into their rural hinterlands (Figure 4-8). In 1898, Greater New York was consolidated into a single city of 3.5 million inhabitants. Despite enlargement of the Croton River system with a new aqueduct completed in 1891 and a new, much larger dam in 1906, the city required new sources of water. Between 1907 and 1929, it developed a series of reservoirs and a new aqueduct to draw water from the Catskill Mountains, 100 miles north of the city. The Catskill Aqueduct crossed the Hudson River by means of an "inverted siphon" 3,000 feet long and 1,100 feet below the surface of the river (Weidner 1974, 161). This spectacular feat was repeated in the 1940s when the city reached out more than 100 miles to the Delaware River headwaters in central New York State. Today, the combined systems supply New York City with over 1.4 billion gallons per day, of which 90 percent is derived from sources west of the Hudson River and the rest from the Croton River (see Figure 4-8a).

Meanwhile, Boston was pursuing a similar strategy under a different governmental framework. Whereas New York City itself established and continues today to operate its water supply system even in upstate New York, Boston's system in 1895 was sold to a newly created regional authority, the Metropolitan Water District, which was charged by state legislation to develop new water supplies to serve Boston and its immediate suburbs. In 1908, the Metropolitan Water District completed Wachusett Reservoir in central Massachusetts, connected by an 18-mile aqueduct to the earlier Sudbury reservoirs. In the 1930s, Boston's principal water source, the 400-billion-gallon Quabbin Reservoir, was constructed in central Massachusetts. The metropolitan Boston water system today serves 2.5 million people in the city and forty-three suburbs (Platt 1995) (see Figure 4-8b).

Thus during the nineteenth century, the water supply systems of both New York City and Boston evolved from dependence on primitive, privately constructed local sources to large-scale, regional systems constructed and operated by governmental agencies. The transition reflects both the advance of modern

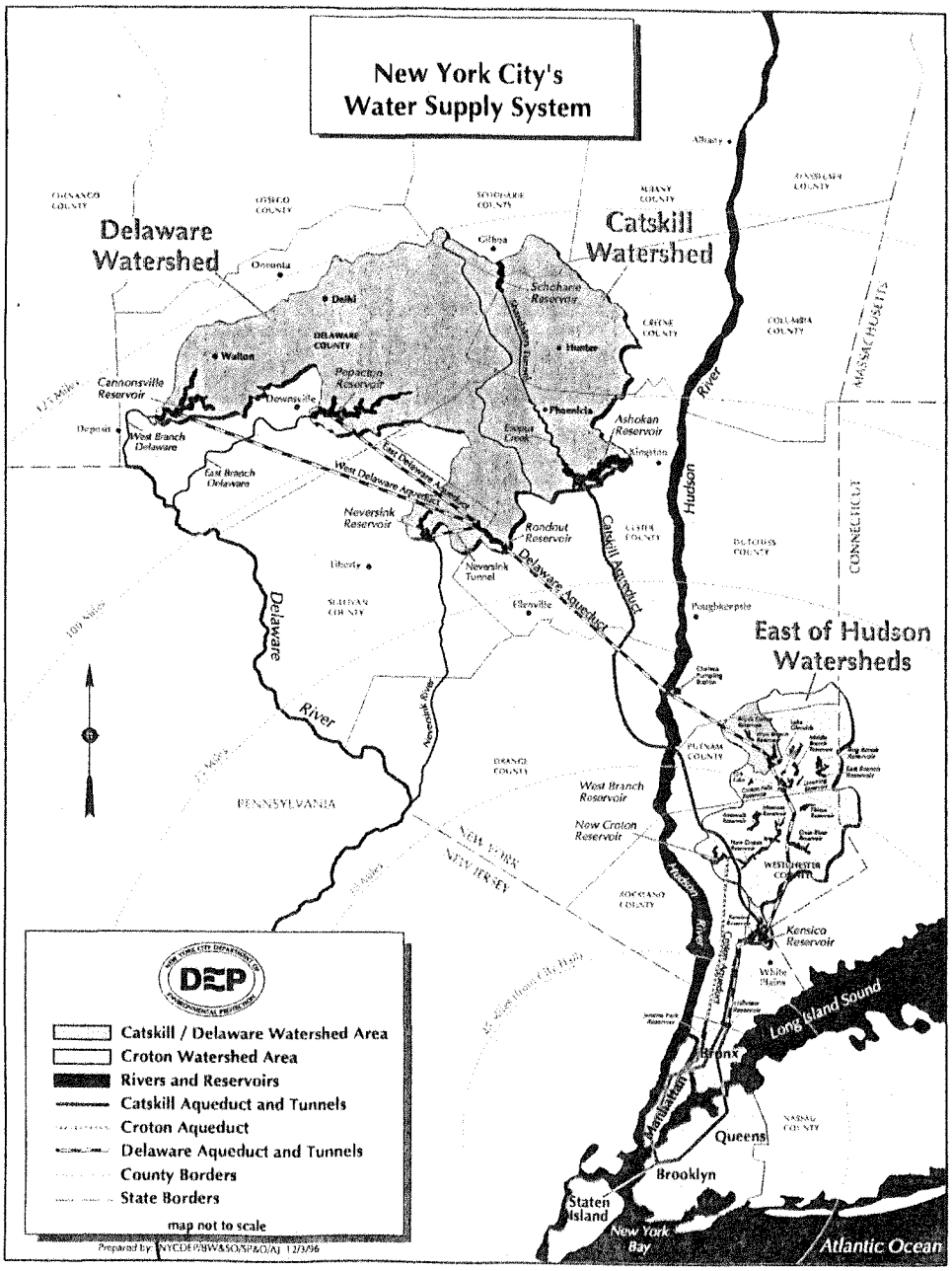
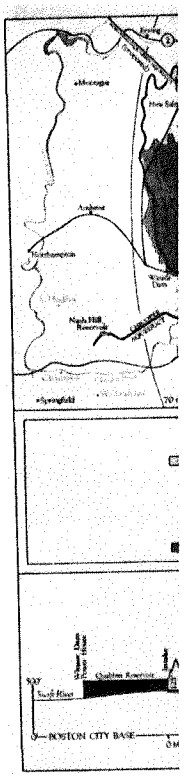


FIGURE 4-8(a) Map of New York City water supply system. *(Source: New York City Department of Environmental Protection.)*



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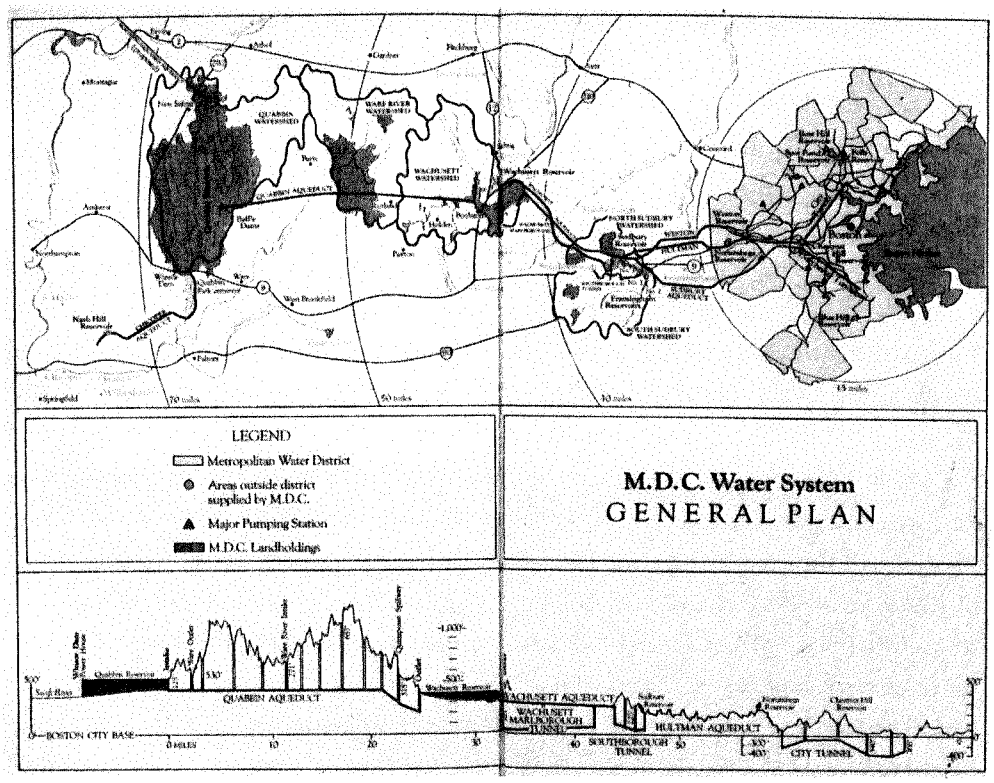

FIGURE 4-8(b) Map of metropolitan Boston water supply system.

technology (e.g., the ability to construct underground aqueducts with high-pressure siphons) as well as the evolution of municipal and regional institutions capable of serving the public interest. As in Paris, the emergence of these institutions was characterized by the development of new forms of finance, the application of modern concepts of eminent domain (land taking), and the administrative skills of technical experts.

The development of the New York and Boston water systems, each based on diversions from distant upland sources, would influence many other U.S. cities. Some cities, of course, did not require long-distance diversions; for example, Great Lakes cities found an ample source at their doorstep. (Chicago, however, had to dig a diversion channel to avoid polluting Lake Michigan—its source of drinking water—with sewage.) Los Angeles through devious means gained control of agricultural water from Owens Valley and constructed a 120-mile aqueduct to convey it to the orange groves of the San Fernando Valley (Reisner 1986). San Francisco after its 1906 earthquake and fire battled successfully against John Muir to dam the

Hetch Hetchy Valley in the Sierra Nevada as a water source (see Chapter 11). The basic strategy behind these and other long-distance urban water projects was learned from New York and Boston: employ modern technology and political power to obtain pure upland water from hinterland sources at high enough elevation to allow it to flow by gravity to where it is needed.

Urban Parks in America: The Olmsted Legacy

Imagine New York City without Central Park, Philadelphia without Fairmont Park, San Francisco without Golden Gate Park, Boston without its "Emerald Necklace," and Chicago without its lakefront parks. How impoverished would be the urban habitat of the older cities of the United States without their distinctive and spacious parks, their "green lungs" as park advocates used to call them. The existence of the great city parks is perhaps taken for granted today by the residents of those cities. Yet like urban water supply systems, parks did not simply happen to fall into place. They were established through deliberate public action, often amid controversy. Their creation during the second half of the nineteenth and early twentieth centuries required vision, money, political power, artistic genius, legal innovation, labor, and technology. The great urban parks were the embodiment of the maturing city as an instrument for social betterment. They have long been its most visible, accessible, and sometimes most neglected artifacts.

The advent of the U.S. parks movement may be traced to 1853, the year that New York's Central Park was authorized by the New York State Legislature. Central Park represented several firsts: (1) the first deliberately planned urban park in the United States (Chadwick 1966, 190), (2) the first park project of Frederick Law Olmsted, (3) the first accomplishment of landscape architecture as a profession in the United States (Fabos et al. 1968), and (4) perhaps the first use of land-value increment taxation to finance a portion of the costs of a public improvement.

In just two decades of immigration from the political turmoil in Europe between 1840 and 1860, Manhattan gained about half a million new inhabitants. In 1845, Dr. John C. Griscom published *A Brief View of the Sanitary Condition of the City,* which, like Chadwick's studies in England, documented the abysmal conditions of overcrowding and incidence of disease in the city's tenement districts (Rosen 1958, 236). One implication of the growing crisis had already been addressed in the development of the new Croton River water supply, which reached the city (but certainly not all its households) in 1842. Another need identified in Griscom's report, as in most sanitary reform literature of the time,

however, was for public parks and open spaces where the working class could devote their few hours of leisure time to outdoor recreation and exercise.

In 1853, New York possessed only a handful of small parks, totaling about 117 acres. These parks were supplemented by a few privately developed "pleasure gardens": urban oases of cafés, music, and flower gardens modeled on Vauxhall Gardens in London or Copenhagen's Tivoli Gardens. By 1850, though, these places were disappearing as their site value for building increased. The only other open spaces available were cemeteries (Olmsted and Kimball 1928/1973, 20–22).

The proposal to establish a large central park in New York actually arose not from the sanitary reformers but from the city's literary and artistic community. During the mid-nineteenth century, the urban upper class became enthralled with the transcendent beauty of nature and wildness through the work of artists such as John James Audubon, Thomas Cole, and Frederick Church, writers such as George Perkins Marsh and Henry David Thoreau, and poets such as William Cullen Bryant and Henry Wadsworth Longfellow. Thus began social action to protect and restore remnants of "nature" within cities and their hinterlands. In 1844, William Cullen Bryant, whose day job was editor of the *New York Evening Post,* wrote, "If the public authorities, who expend so much of our money in laying out the city, would do what is in their power, they might give our vast population an extensive pleasure ground for shade and recreation" (Olmsted and Kimball 1928/1973, 22). Bryant's appeal was reinforced by landscape architect Andrew Jackson Downing whose journal *The Horticulturist* urged that New York should emulate English cities in the creation of large public parks.

Without a legacy of royal lands as Nash had to work with in London, however, New York had to purchase land for a park from private owners. To obtain a sizable tract of land at a reasonable cost, it was necessary to look beyond the limits of the existing built-up city—about 34th Street in 1850—to the still rural precincts of upper Manhattan. At that time, the proposed site of Central Park was a messy landscape of squatters, goats, mud, and rubbish, a thirty-minute walk from the existing city. Its advocates, however, correctly anticipated that all Manhattan would soon be paved and built over, and thus the park would be central indeed.

After prolonged lobbying by Bryant, Downing, and others, the New York State Legislature in 1853 authorized the city to establish Central Park. It was originally to comprise a rectangle of 770 acres, including space for two reservoirs to receive water from the new Croton system. The park was later expanded to 110th Street on the north, bringing its total area to 843 acres, about 0.5 mile east and west by 2.5 miles north to south.

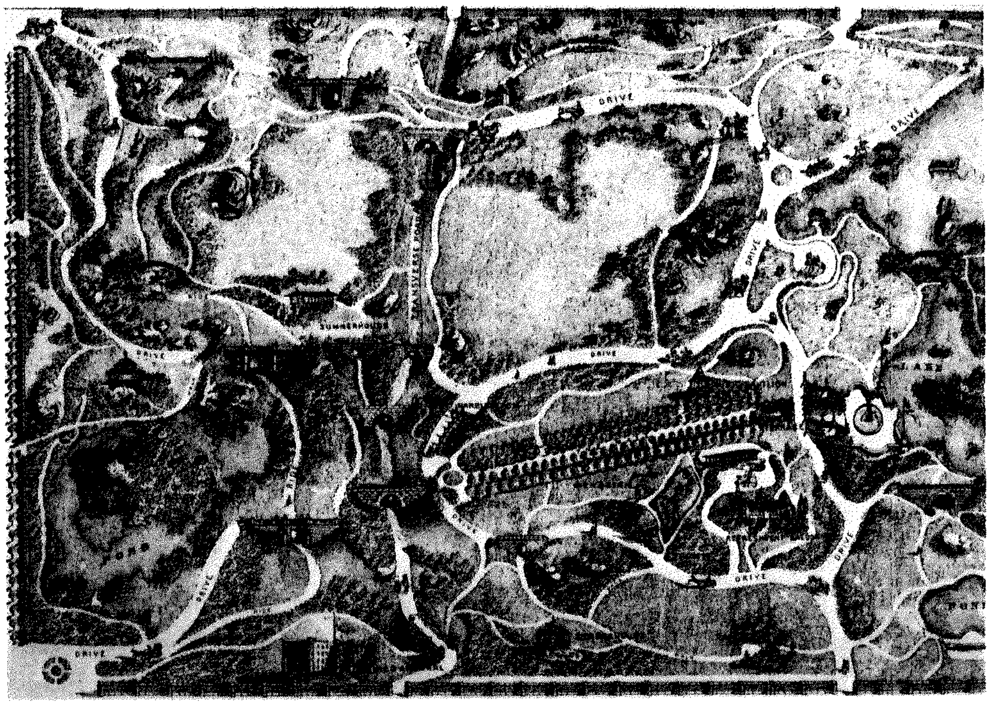

FIGURE 4-9 Excerpt from "Greensward Plan" for New York City's Central Park by Olmsted and Vaux, 1858. *(Source: Fabos, Milde, and Weinmayr 1968.)*

The conversion of this huge and squalid tract of land into one of the world's great urban parks was the triumph of Frederick Law Olmsted. Olmsted possessed no particular training for landscape architecture, a field that he would soon dominate. Born in 1822, he studied agricultural science and engineering at Yale and then devoted himself to farming, travel, and writing. He moved from his farm on Staten Island directly to the post of superintendent of the new Central Park project in 1857 (Sutton 1971, 7). In collaboration with Calvert Vaux, he prepared the winning plan in a design competition for the park. In 1858, he was appointed Architect in Chief to execute their plan.

Olmsted and Vaux's *Greensward Plan* for Central Park (Figure 4-9) was influenced by English "picturesque" landscape designs, particularly Nash's Regent's Park in London and Joseph Paxton's Birkenhead Park in Liverpool (Chadwick 1966, 71–72). The essence of this style was deliberate informality, contrast between open meadow, groves of woods and water, and attention to the park's borders with the surrounding city. Although as carefully planned and engineered as a formal baroque park such as Versailles, the picturesque style sought to create the illusion of an artificial "countryside." Olmsted wrote in 1872 that his purpose

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in designing Central Park was "to supply to the hundreds of thousands of tired workers, who have no opportunity to spend their summers in the country, a specimen of God's handiwork that shall be to them, inexpensively, what a month or two in the White Mountains or the Adirondacks is, at great cost, to those in easier circumstances" (Olmsted and Kimball 1928/1973, 46).

A distinctive feature of Central Park, later widely imitated, was the separation of different forms of circulation. Pedestrians were removed from the path of equestrians and carriages, and internal bridle paths and carriage roads were isolated from cross streets for through traffic. Where routes serving different purposes met, Olmsted provided under- or overpasses to eliminate stopping points and to enhance the illusion of open countryside.

The building of Central Park was the largest public work yet undertaken in the city of New York, involving thousands of jobs and millions of dollars. The city's political machine known as "Tammany Hall" hampered Olmsted in the execution of his plans during the twenty-five years of his official connection with Central Park. He actually resigned from the project five times (Sutton 1971, 9). The park has continued to spark civic controversy ever since, as in the "Tavern on the Green" battle in the 1960s when Parks Commissioner Robert Moses ordered bulldozers to clear trees for a restaurant parking lot within the park that was opposed by park advocates (Caro 1974).

Despite its political travails, Central Park was a spectacular financial success. The total cost of acquiring its site of 843 acres from private owners was $7.4 million. The cost of improvements to the site was about $8.9 million (Olmsted and Kimball 1928/1973, 54, 95). The project was self-funding through increases in property tax collections on surrounding land. In the 1870s, the annual increase in such taxes was estimated to exceed the annual interest on the park project costs by over $4 million (Olmsted and Kimball 1928/1973, 95). Today, condominiums with a view of Central Park cost several million dollars apiece, with city tax revenues enriched accordingly.

From its inception, Central Park was also a practical success. In 1871, usership of the park amounted to some 30,000 visitors per day and more than 10 million per year (Olmsted and Kimball 1928/1973, 95), or about ten visits per capita for the entire population of Manhattan! Olmsted and Vaux sought to encourage active use in many ways, such as horseback riding, boating, carriage driving, skating, cycling, and strolling. Picturesque informality dominates most of the park plan, with the exception of a formal baroque-style mall. Open meadows, rocky outcrops, wooded areas, and water surfaces encourage spontaneity and the sense of freedom that

FIGURE 4-10 Enjoying Central Park on a fine June day, 2003. *(Photo by author.)*

provided, then and now, a charming facsimile of a rural landscape in the very heart of the nation's largest city (Figure 4-10).

Olmsted was not reticent about his achievement. In 1880, he wrote:

> To enjoy the use of the park, within a few years after it became available, the dinner hour of thousands of families permanently changed, the number of private carriages kept in the city was increased tenfold, the number of saddle horses a hundredfold, the business of livery stables more than doubled, the investment of many millions of private capital in public conveyances made profitable. It is often said, How could New York have got on without the park? Twelve million visits are made to it every year. The poor and the rich come together in it in larger numbers than anywhere else and enjoy what they find in it in more complete sympathy than they enjoy anything else together. The movement to and from it is enormous. If there were no park, with what different results in habitat and fashions, customs and manners, would the time spent in it be occupied.
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> And the Park of Brooklyn [Prospect Park] . . . is sure, as the city grows, to be a matter of the most important moulding consequence—more than the great bridge [Brooklyn Bridge], more so than any single affair with which the local government has had to do in the entire history of the city. (Quoted in Sutton 1971, 255)

The use of the term *moulding* [*sic*] suggests two meanings. First, Central Park and its counterparts in other cities were designed to "mould" the physical form and structure of the surrounding city. Parks were conceived to be oases of open space and bucolic scenery around which the city would grow. Second, parks were intended to "mould" the moral character of the populace. Olmsted frequently pontificated on the benefit of open space and outdoor recreation on the physical and mental health of the city dweller. These views became articles of faith in twentieth-century urban and regional planning. Today, Central Park has been substantially restored under the direction of Elizabeth Rogers, a landscape architecture historian and recently the administrator of the park and head of the Central Park Conservancy (www.centralparknyc.org). A parallel upgrading of Olmsted and Vaux's Prospect Park in Brooklyn (www.prospectpark.org) has been led by Tupper Thomas.

Perhaps Olmsted's most important contribution to modern city planning was the recognition of parks and open space as integral elements of the urban system:

> The success and popularity of Central Park started a trend, and city administrators throughout the country woke up to the advantages of open spaces. The land they were willing to purchase and sacrifice for this purpose, however, was usually some site undesirable for commercial or residential buildings, and in no way integral to the established patterns of city life, for example: the Fens in Boston; the mountain in Montreal; the swamps in Buffalo; the marshlands in Chicago. In general, the officials adopted simplistic notions of a park, separating it in their minds from the activities of the city. *Olmsted's effort was to integrate the two.* (Sutton 1971, 10–11; emphasis added)

The Emerald Necklace plan for the Boston park system, formulated in the 1880s, was a logical progression from the concept of Central Park (Figure 4-11). It comprised a series of major and minor open spaces, some existing and some proposed, to roughly encircle central Boston on its landward side. One anchor for the necklace was the old Boston Common and the new Public Garden (laid out in 1839). The other terminus of the necklace was the proposed Franklin Park. These parks were to be connected by a series of parkways and greenways bordering local streams. The achievement of these links was to be incorporated within the ongoing development of new land created by draining the Back Bay marshes in the 1860s. Commonwealth Avenue, a broad parkway, formed the main axis of the fashionable new Back Bay district and simultaneously served as a link in the Emerald Necklace.

The next link was less obvious. Olmsted urged that a remaining stretch of marsh bordering the humble Muddy River, a tributary to the Charles River, be set aside as open space rather than be filled like the rest of Back Bay. Viewed in isolation, the Muddy River Fens were befouled with rubbish and sewage and were generally unpromising as urban park space. Olmsted, though, enumerated multiple benefits to be achieved in rehabilitating the swamp: (1) abatement of a "complicated nuisance," (2) "reconciliation of convenient means of general public communication through the adjoining districts of the city," (3) "dressing and embellishment of the banks," and (4) an element of a "general scheme of sylvan improvement for the city" (quoted in Sutton 1971, 227). Olmsted's Fenway is today sadly overshadowed by an elevated highway. It is chiefly known for its namesake, Fenway Park, the home of the Boston Red Sox, and for its community gardens planted and tended by neighborhood residents (Figure 4-12).

The two paradigms of Olmsted's legacy were thus reflected in Central Park and the Emerald Necklace. The former involved the use of open space as the "working man's White Mountains" and the latter the use of a series of connected open spaces to interrupt or buffer the spread of urbanization. Olmsted enjoyed a wealth of opportunities to apply these two paradigms in various cities of North America. In contrast to Haussmann, who dealt with all planning elements of a single city, Olmsted specialized in a particular city element—parks and open space—in more than a dozen major cities. Olmsted is most celebrated for his achievements under the first paradigm, the creation of the great urban parks, but few more of them were established in the United States in the twentieth century as the white middle class fled to the suburbs, turning its back on cities. The second paradigm—interruption of urban sprawl with greenbelts and other systems of green spaces—would become a prominent theme of the conservation movement of the 1960s and thereafter (Platt 1994, 2000).

No appraisal of Olmsted would be complete without mention of his contributions to urban planning. In 1869, he and Calvert Vaux designed the prototype "garden suburb" at Riverside, Illinois, just west of Chicago (Jackson 1985, 79–81). Riverside's curvilinear streets, common greenways, and spacious residential lots impressed Ebenezer Howard, who visited there in 1876 and incorporated these characteristics into his influential garden city concept that in turn would influence twentieth-century American planning advocates like Lewis Mumford. Olmsted returned to Chicago in 1890 as landscape architect to the Columbian Exposition of 1893. He planned the lakefront site for this world's fair (which today is Jackson

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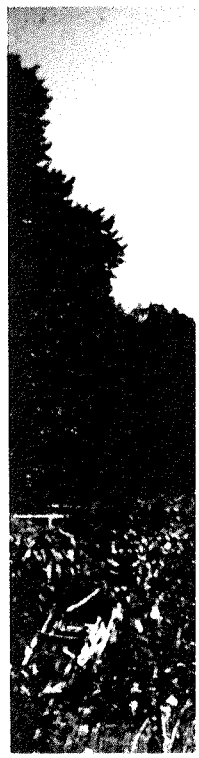

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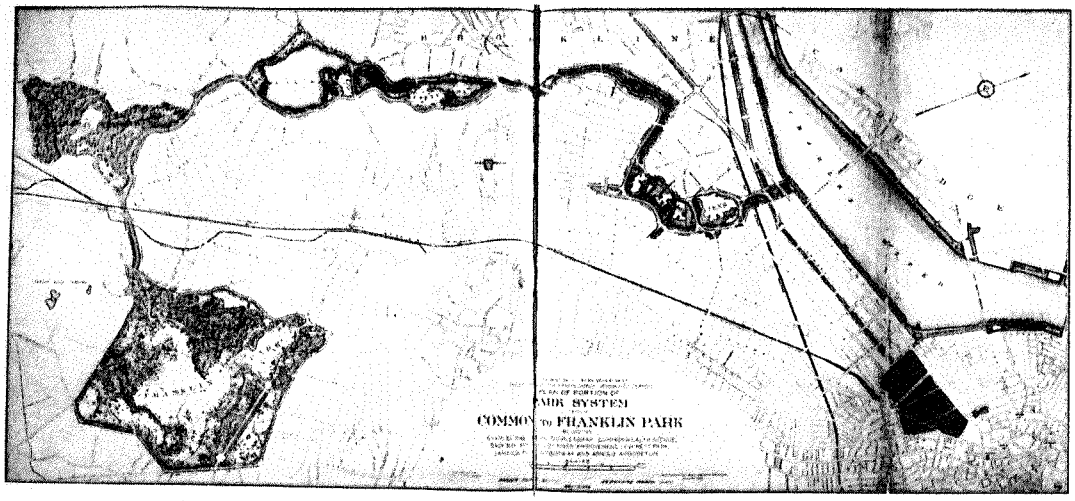

FIGURE 4-11 Olmsted's "Emerald Necklace" plan for the Boston park system, ca. 1885. *(Source: Fabos, Milde, and Weinmayr 1968.)*

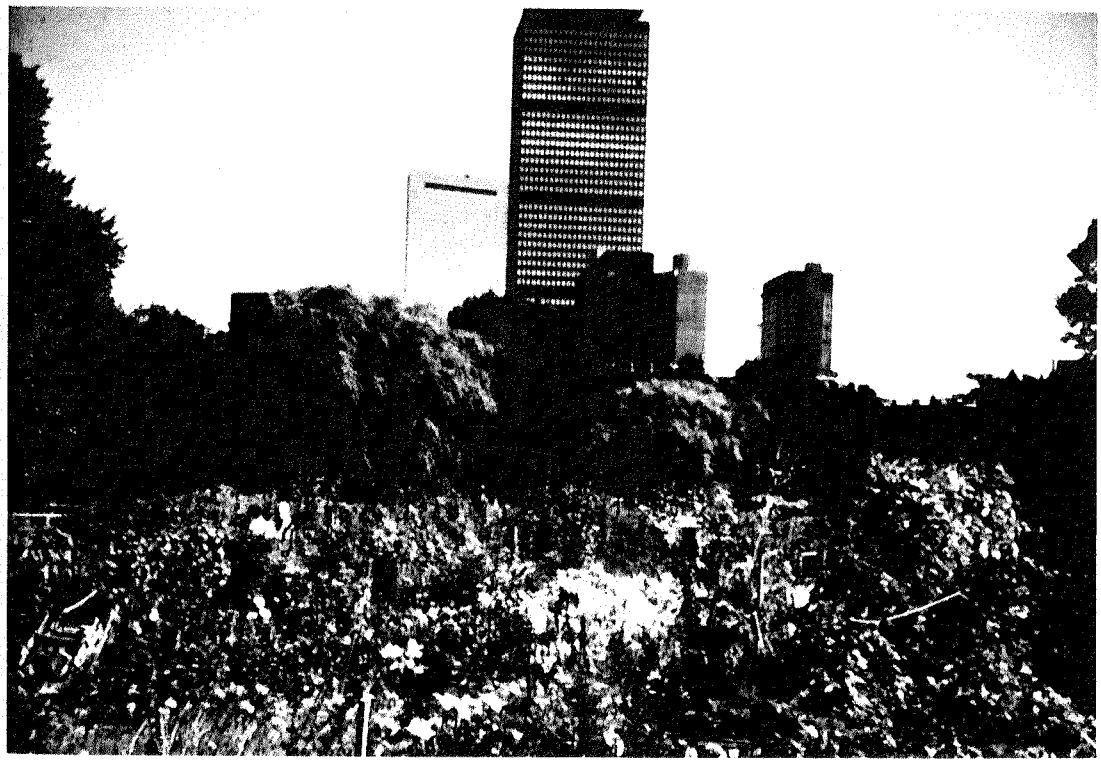

FIGURE 4-12 Community gardens in the Fenway, Boston, with Prudential Building in background. *(Photo by author.)*

Park) to accommodate great pavilions and exhibition halls amid open courts, lagoons, reflecting pools, and statuary. Alongside this beaux arts "White City" was a touch of pure Olmsted, a wooded island "to contrast with the artificial grandeur and sumptuousness of the other parts of the scenery" (Sutton 1971, 194).

Behind the grandiose stage set of the White City, the 1893 exposition was admired for its applications of modern technology and planning. Transportation, food, lighting, water supply, waste disposal, and mechanical energy were all incorporated into its design. To highlight its function as a showcase for electricity, President Grover Cleveland activated its lighting and fountains by pushing a button in Washington, D.C. (to the strains of Handel's "Hallelujah Chorus" sung by a chorus of one thousand!). Thus even though the exposition looked backward to Haussmann, Versailles, and antiquity for its architectural inspiration, it looked forward to the next century in its application of technology to the design of a new community, albeit a temporary one. The contrast between the planned environment and what lay beyond its borders was widely noted:

> The [Exposition] was an artificial city that conflicted with the actual city in almost every important element. Where the American metropolis was chaotic and disorganized, the Exposition was planned and orderly; while the real city was private and commercial, the ideal was public and monumental; where Chicago was sooty and gray, the White City was clean and sparkling. (Mayer and Wade 1969, 193)

Olmsted as landscape architect was of course not responsible for the functional arrangements of the fair, but he may be credited for having successfully assimilated the demands of technology and aesthetics in his site design. This design was in effect a land use plan incorporating both the built and the unbuilt elements of a "city." The application of this integrative approach to actual cities and their surrounding regions, most notably in the 1909 Plan of Chicago, would be the work of Daniel H. Burnham, a Chicago architect and director of works for the fair. In effect, the torch of national preeminence in the art of planning cities passed from Olmsted to Burnham at the 1893 exposition. This summary of Olmsted's contributions to the U.S. city appropriately ends with a tribute to him by his successsor, Daniel Burnham:

> The genius of him who stands first in the heart and confidence of American artists.... He who has been our best adviser and our common mentor. In the highest sense he is the planner of the Exposition. No word of his has fallen to ground since first he joined us.... An artist, he paints with lakes and wooded slopes; with lawns and banks and

> forest-covered hills; with mountain-sides and ocean views. [We honor him] not for his deeds of later years alone, but for what his brain has wrought and his pen has taught for half a century. (Quoted in Chadwick 1966, 196)

Relocation: The Ideal Communities Movement

This chapter has so far considered two broad avenues of public response to eighteenth-century urban crowding and squalor, namely *regulation* of building and sanitary conditions and *redevelopment* and expansion of urban infrastructure. These two approaches went hand in hand: the first yielded building and sanitary codes to be applied by local public authorities to new construction; the second fostered the development of new streets and residential districts, water systems, sewers, parks, and other infrastructure. The regulatory and the redevelopment approaches addressed the ills of existing cities directly, with gradual, uneven, but sometimes positive results.

There was, however, a third approach to the problem of urban squalor proposed by a handful of eighteenth-century utopians and progressives, namely *relocation* of workers to new, planned industrial villages in rural settings. Such communities, it was argued, would promote health, happiness, productivity, and morality. Several public-spirited individuals in Europe and the United States put their beliefs into practice and created model villages to inspire wider imitation. Although they did not succeed in the latter goal, the experimental communities and the theories of socioeconomic organization that prompted them have deeply influenced twentieth-century planning ideology.

The remainder of this chapter considers the experience of three early proponents of ideal communities. To list them is to indicate that this was no tightly circumscribed school or movement, but rather a diverse collection of individualists who were motivated by very different goals and assumptions. Those considered here are the Welsh-born utopian Robert Owen, the Chicago sleeping-car magnate George Pullman, and the stenographer-turned-progressive Ebenezer Howard. These and their like-minded contemporaries had little in common except for a repugnance for large cities, an impatience with conventional reforms, and a faith in environmental determinism.

An important heritage that influenced the planning of model industrial communities was the spiritual utopia movement that proliferated in the United States and elsewhere beginning in the late eighteenth century. The movement included

a few long-lasting and economically viable communities such as the Shaker villages of New England and New York, the Oneida settlement in New York, the Amana Colonies in Iowa, and the Mormons in Illinois, and later, Utah. They also included a variety of more ephemeral utopian experiments whose religious or philosophical objectives perhaps overshadowed economic and functional practicality, as with Brook Farm in Massachusetts or the thirty *phalanxes* established in the United States between 1843 and 1858 by followers of the French utopian philosopher Charles Fourier (Hayden 1976, 149). Concepts for spiritual utopias floated in the wind of mid-nineteenth-century America like cottonwood seeds. According to Ralph Waldo Emerson in 1840, "Not a reading man but has a draft of a new community in his waistcoat pocket" (quoted in Hayden 1976, 9).

Utopian settlements established for religious or philosophical purposes were by definition limited to adherents to those beliefs, whereas industrial model towns were intended for the laborers working for particular companies. The spiritual communities valued total isolation from mainstream society, whereas the industrial communities required access to main transportation routes (obviously a sleeping-car factory had to be connected to mainline railroads). Religious communes, however, undoubtedly influenced the concept and form of industrial model towns and garden cities. Fundamental elements of both types of communities included (1) centralized control over the use of land and structural development (usually through ownership of the site by sect or corporation); (2) proximity of work and residence; (3) population limits with overflow to be accommodated in new settlements in the vicinity; (4) a rural setting with much open space within and surrounding the community; and (5) facilities and programs for social, cultural, and moral betterment.

Owen: From Practice to Theory

Robert Owen (1771–1858) and Ebenezer Howard (1850–1928) symmetrically opened and closed the nineteenth century. Owen moved from practical experience gained in a preexisting community—New Lanark, Scotland—to articulate a general theory of cooperative socioeconomic organization. Howard first formulated his theory of the *garden city* and then successfully applied it in the establishment of new communities at Letchworth and Welwyn. Both men proselytized public opinion but with quite different styles and results. Howard's "peaceful path to reform" promised a humanitarian experiment involving "no direct attack upon vested interests" (Osborn, 1945/1965, 131). He was rewarded with a knighthood in

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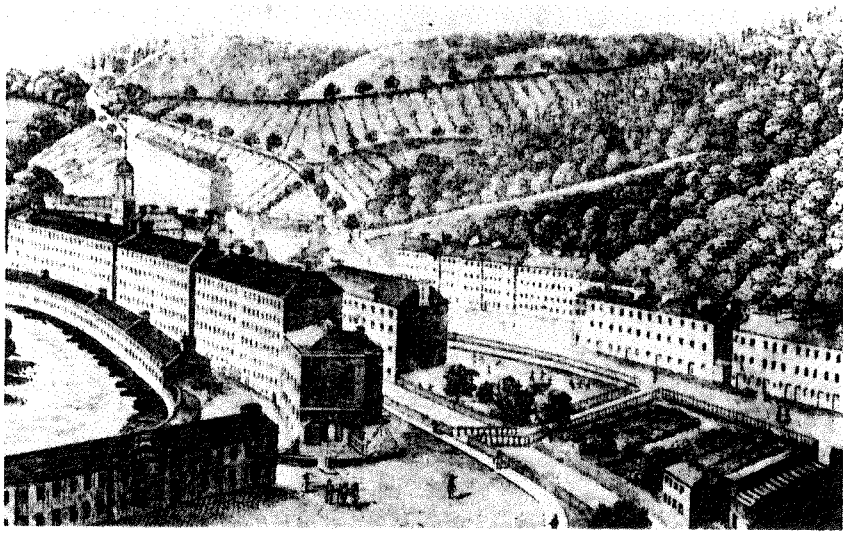


FIGURE 4-13 Robert Owen's New Lanark, ca. 1818. *(Source: Reproduced by permission of New Lanark Conservation Trust.)*

1927. Owen's more strident advocacy of labor organization earned him the adulation of subsequent socialists but no knighthood. Discussion of each of these visionaries, together with the pragmatic American industrialist George Pullman, will conclude this chapter.

The laboratory for Robert Owen's far-ranging theories was New Lanark, a village founded in 1783 as a site for cotton-spinning mills on a rapids of the Clyde River in south central Scotland (Figure 4-13). Upon marrying the daughter of one of the founders in 1800, Owen assumed the position of manager of the mills, which then employed more than 1,100 workers, two-thirds of them children. Owen devoted the next fourteen years and much of his personal profits to the improvement of New Lanark, both physically and institutionally. Living conditions first attracted his attention:

> The great bulk of their houses ... consisted of one single room, and before the door of that room was, as often as not, a dung-heap. One of Owen's first acts was to build another story to each of these houses, thus giving the family two rooms, and to remove the dung-heaps to a less unhealthy and unsightly position. (Cole 1953, 54)

Owen also had the streets cleaned and paved and reorganized the provision of food and coal to the inhabitants, but his chief contribution to New Lanark was in the area of education. He espoused the view, remarkable at the time, that children should be in school rather than in the mills, at least until the age of ten! His

Institute for the Formation of Character opened in 1816 in collaboration with the radical philosopher Jeremy Bentham. The institute provided child care and instruction beginning when a child could walk. It was designed to provide a balance of classroom teaching, exercise, and training in music and the arts (Benevolo 1967, 40).

No more humble than Haussmann or Olmsted, Owen referred to New Lanark as "the most important experiment for the happiness of the human race that has yet been instituted at any time in any part of the world" (Allen 1986, 3). The scope of his increasingly utopian schemes, however, was rapidly expanding beyond the possibilities for practical implementation in the "experimental cell" of New Lanark (Ashworth 1954, 119). In response to a national inquiry into the problem of unemployment and public unrest after the close of the Napoleonic Wars, Owen articulated his vision for "villages of cooperation" to accommodate workers displaced from their former jobs, who now were crowding the cities and depending on meager relief. (This idea might resonate in the United States today.)

Owen envisioned villages of about one thousand inhabitants who would chiefly be occupied in farming, although some "manufactories" would also be provided. Like a feudal manor, each village would be largely self-sufficient in food (Cole 1953, 110). He specified the size, use, and arrangement of buildings for communal living, dining, education, and relaxation. Supportive facilities included churches, stables, slaughterhouses, breweries, and corn mills. Missing from this list were courts of law and prisons, which he deemed superfluous!

According to his son, Owen's "one ruling desire was for a vast theater on which to try his plans of social reform" (Owen 1874, 211). He became convinced that such a theater could be found not in Britain but in the hinterland of the United States. The site of his second practical experiment in social organization was New Harmony, Indiana, on the Wabash River. In 1825, Owen purchased a communal village already established there by followers of the utopian George Rapp, together with 20,000 acres of alluvial farmland and forest. He and his son moved there to establish a "village of cooperation."

The enterprise was a failure. Unlike New Lanark, New Harmony lacked an existing economic base to undergird its social principles. Furthermore, Owen attempted to carry these principles much further than at New Lanark, to make every adult settler an equal partner in the ownership, operation, and economic yield of the land and manufacturing assets of the village: "Liberty, equality, and fraternity, in downright earnest!" (Owen 1874, 254). This goal, to which Owen pledged his personal wealth, was defeated by the unsuitability of the people who

were attracted to settle there "a heterogeneous collection of radicals, enthusiastic devotees to principle, honest latitudinarians, and lazy theorists, with a sprinkling of unprincipled sharpers thrown in" (Owen 1874, 254). In 1827, Owen declared the project a failure and returned to England, having lost four-fifths of his own wealth.

New Harmony was Owen's last attempt to found or restructure a social community himself; subsequent experiments of this kind were conducted by his Owenite disciples (with similarly disastrous results). Owen devoted the remainder of his life to the cause of trade unionism and the advocacy of worker cooperatives.

Pullman: The Perils of Paternalism

George M. Pullman (1831–1897), one of the United States' most prominent union busters, was an incongruous successor to Robert Owen in the field of ideal town building. Like the early Owen of New Lanark, Pullman was a capitalist entrepreneur who recognized that a worker is likely to be more productive if he or she is well housed, well fed, healthy, and entertained. Yet whereas Owen departed from the profit motive to explore the possibilities of pure socialism at New Harmony, Pullman remained a stalwart industrialist. Ironically, despite the apparent success of his town in terms of bricks and mortar, Pullman's experiment in socio-economic engineering was ultimately defeated by his obstinate *capitalism* as surely as Owen's obstinate *socialism* proved *his* undoing at New Harmony. Pullman, Illinois, is probably better known for the great labor strike that occurred there in 1894 than for its physical plan and amenities. Perhaps the underlying similarity of both men was their inability to compromise.

George Pullman invented the railroad sleeping car that bore his name in 1864 and thereafter dominated the construction and operation of such cars on railroads throughout the United States. (Readers who have never heard of, let alone traveled on, a "Pullman Car" are referred to the Marilyn Monroe film *Some Like It Hot* for a sense of the experience!) To establish a new factory for his burgeoning Pullman Palace Car Company, Pullman in 1880 purchased 4,000 acres of prairie and boggy wetland adjoining Lake Calumet, 20 miles south of downtown Chicago. This site was certainly not selected as a rural utopia, but rather for the sound reasons of cheap land and accessibility to mainline railroads. There was, however, nowhere for a workforce to live without a long train ride. Making a virtue of necessity, Pullman undertook to build a brand-new town as a model of enlightened corporate planning and good employer-employee relations (Figure 4-14).

There were few precedents to draw on. Since New Lanark, only a handful of

industrial model towns had actually been constructed in Europe and the United States (Ashworth 1954, 126). The best known were Titus Salt's woolen-mill town Saltaire in England, completed in 1871, and the Massachusetts towns of Lowell and Holyoke, which produced textiles and paper, respectively. With the help of a New York architect Pullman essentially designed his town personally.

The basic elements of the town were the car factory, the residential district, a commercial and cultural arcade, a covered market, parks, a hotel, a theater, and an interdenominational church. All were built and owned by Pullman through a holding company. In physical terms, it was progressive, humane, and "ideal." Housing of diverse size and rental cost was provided to accommodate both laborers and managers. Even the lowest-cost units consisted of brick row houses lining paved streets at densities of eight to ten per acre, far less crowded than usual at the time (Saltaire in England had thirty-two houses per acre). Human wastes were collected and conveyed by pipeline to agricultural land south of the town that produced commodities for sale in the local market. Consistent with Owen, and later, Howard, alcoholic beverages were banned from sale in the town, but schools, a

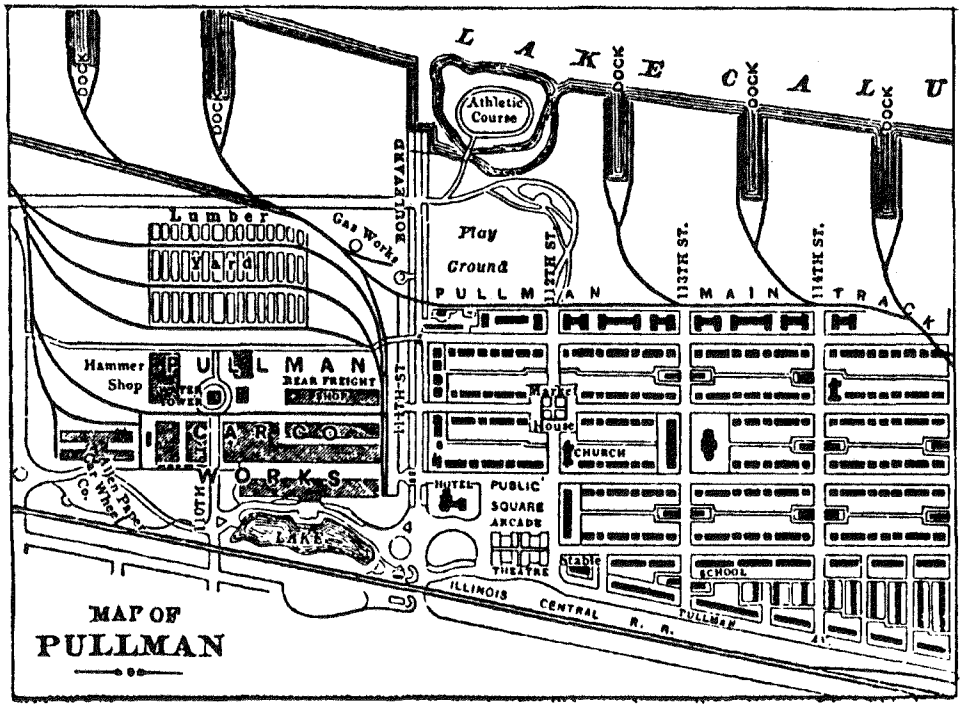


FIGURE 4-14 Map of Pullman, Illinois, 1885. *(Source: Buder 1967. Reproduced by permission of Oxford University Press.)*

library, a theater, and other morally uplifting amenities were provided at Pullman's expense.

The town attracted immediate public attention:

> From 1880 to 1893, the town was intensely surveilled [*sic*]. Hundreds of thousands saw this most modern and novel of communities and an overwhelming majority left impressed.... Here was an American utopia that people wanted to succeed. (Buder 1967, 92–93)

The town was touted at the company's exhibit at the 1893 world's fair in Chicago as a place "where all that is ugly, and discordant and demoralizing is eliminated, and all that inspires to self-respect, to thrift and to cleanliness of thought is generously protected" (Buder 1967, 148).

Unfortunately, similar protection was not extended to the right to form a labor union or to object to company policies on wages, hours, and costs of rent, water, and food in the company store. The paternalism that benefited the eight thousand inhabitants in prosperous years became their scourge when recession forced wage cuts and layoffs in 1894. The hand that fed them could also starve them. The resulting strike lasted three months and provoked the first use of federal troops in U.S. labor history. George Pullman died three years after the strike, vilified by those whom he thought he was helping. The town, severed by legal action from the company in 1904, gradually deteriorated into obscurity until gentrification set in during the 1960s. Pullman's worker row houses rebounded as solid investments for Chicago yuppies.

Howard: From Theory to Practice

It was perhaps inevitable that an Ebenezer Howard should appear at the close of the nineteenth century. England and the United States were rife with utopian and progressive outrage concerning the state of large cities. Someone had to synthesize the many strands of thought, word, and deed into a practical program. That was Howard's contribution. In his own words, "I have taken a leaf out of the books of each type of reformer and bound them together by a thread of practicability" (Osborn 1945/1965, 131).

In effect, Howard blended Owen's New Lanark cooperative socialism with Pullman's bricks-and-mortar paternalism (although neither are discussed in his book). He incorporated impressions of landscape design experienced during his visit to Olmsted's Riverside, Illinois, community. He was influenced by Henry

George's theory of a single tax on land rent to recoup undeserved profits of land ownership for the public welfare. He was enthralled with Edward Bellamy's 1889 socialist tract *Looking Backward,* which envisioned American society recast on Owenite principles with centralized planning, cooperative enterprise, and equality of income (Fishman 1977, 33).

There was in fact very little that was original in Howard's garden city proposal, but the assimilation of these and other intellectual "leaves" yielded his influential little book, *To-morrow: A Peaceful Path to Real Reform* (published in 1898 and reissued in 1902 as *Garden Cities of To-morrow*). According to Lewis Mumford in his preface to the 1965 republication the book, "*Garden Cities* ... has done more than any other single book to guide the modern town-planning movement and to alter its objectives" (Osborn 1945/1965, 29).

Howard was the last of the great nineteenth-century self-taught urban reformers. By trade, he was a court stenographer and inventor, implying an ability to record faithfully the statements of others and to assemble components into a workable machine. Both skills, his admirers have noted, served him well in formulating his garden city theory, first in assimilating the ideas of the time and second in visualizing a community as a system or "machine." Frederick J. Osborn, Howard's chief disciple and publicist, described him as "not a political theorist, not a dreamer, but an inventor" (Osborn 1945/1965, 21). Another biographer identifies a trait of "Americanism" in Howard's personality:

> The special inheritance of the Puritan as we see it philosophically in Emerson, practically in [Henry] Ford, is a real conviction that mind triumphs over matter, that a clear idea tends to actualize itself by the inherent force that is in it. The mind of old England works from the concrete to the abstract—the New Englander works from the ideal to the real. (MacFadyen 1933/1970, 11)

Although Howard was scarcely a New Englander, the analogy is apt: in contrast to Owen, he effectively moved from theory to the practical.

The garden city idea was represented by Howard's famous magnet metaphor (Figure 4-15) wherein *town* and *country* are opposed. The former affords economic opportunity and culture at the expense of health, high prices, and crowding, whereas the latter provides a healthy environment but also boredom, poverty, and "lack of society." Howard's remedy was represented by a third magnet, *town-country,* which incorporated the advantages and minimized the negative features of the other two. It was Howard's fundamental synthesis, which appealed strongly to the Hegelian spirit of the time: "thesis, antithesis, synthesis."

Howard's magnet metaphor had additional significance. He rejected compulsion by a central authority as a means of accomplishing resettlement of population to the new garden cities. He viewed migration as a voluntary, individual decision. Thus his proposed garden city(ies) would offer inducements—social, environmental, and economic—that would draw working-class people away from the miserable conditions of the large cities and would intercept rural migrants headed toward the same cities. In Howard's diagram, " 'The People' are poised like iron filings between the magnets" (Fishman 1977, 39).

The physical plan of the garden city reflected Howard's "central idea that the size of towns is a proper subject of conscious control" (Osborn 1945/1965, 10). His recommended population size was about 32,000 people, sufficient to attract industry and sustained cultural and social activities but small enough to retain a healthy and uncrowded environment. Such a community was to be situated on a tract of about 6,000 acres, of which the town itself would occupy a central core of 1,000 acres. The remainder would be devoted to a circumferential *greenbelt* of agriculture and other rural activities (Figure 4-16). Garden cities were to be located within convenient rail distance of a central metropolis (e.g., London) but should develop a local economic base to discourage long-distance commuting to work.

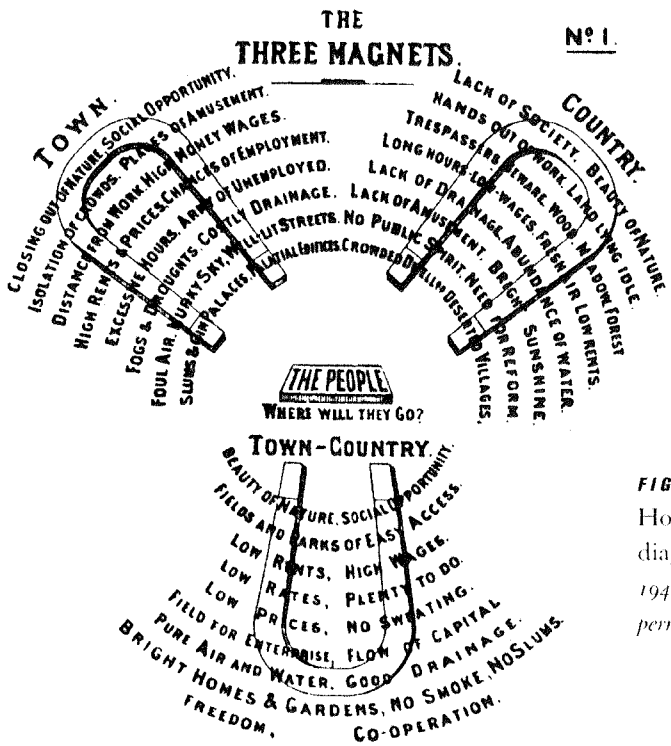
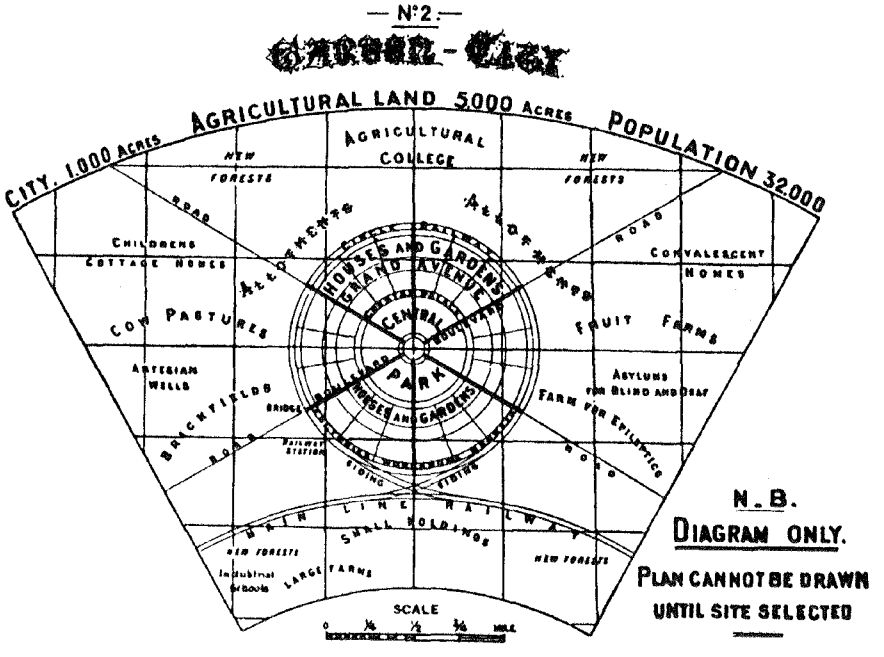


FIGURE 4-15
Howard's "Three magnets" diagram. *(Source: Osborn 1945/1965. Reproduced by permission of MIT Press.)*

Internally, the garden city would provide a range of housing opportunities to attract families of different socioeconomic levels (as in Pullman). Dwellings were to be situated along broad sylvan boulevards or local interior streets. The center of the town would be devoted to a community park surrounded by a "crystal palace" or enclosed shopping arcade, together with a "town hall, principal concert and lecture hall, theater, library, museum, picture-gallery, and hospital" (Osborn 1945/1965, 53). Privately tended gardens and common open spaces would interlace with the village core and residential areas (the Olmsted factor). An outlying industrial district would accommodate smokeless, "nonsweat" industry (Figure 4-17).

Crucial to the importance of Howard's proposal was its means of accomplishment. The entire site of the garden city, including its agricultural greenbelt, was to be acquired, planned, and managed in perpetuity by a limited-dividend (nonprofit) charitable corporation or trust. This entity would raise capital from philanthropically inclined private investors in exchange for a modest, fixed rate of return. The trust would derive all its revenue from rents on land used for residence, business, industry, and agriculture. Any revenue accruing to the trust over and above the dividend to investors and operating costs would be returned to the community for beneficial purposes (the Henry George factor). As owner of the



GARDEN CITY AND RURAL BELT

FIGURE 4-16 Howard's diagram of Garden City and its "Rural Belt."
(Source: Osborn 1945/1965. Reproduced by permission of MIT Press.)

land, the trust would strictly control land use and development according to a community master plan.

Limitation of population size would be achieved by limiting the supply of dwelling units and by establishing additional garden cities at a suitable distance. Howard envisioned that the prototype community would lead to a cluster of such towns, separated by their greenbelts, that in time would become a formidable "magnet" drawing the working-class populace out of the cities.

Howard and his supporters actually built two garden cities: Letchworth, starting in 1903, and Welwyn in 1920. Of the two, Letchworth is the more faithful to Howard's principles and the more widely admired. Its present population is about 32,000 as Howard had envisioned. Its residential district is graced by "cottage picturesque" architecture set amid gardens, parks, and grassy commons. The town plan of 1903 by Barry Parker and Raymond Unwin smoothed the rigid symmetry of Howard's diagrams in favor of a more organic, informal design. It includes prototypical suburban *cul-de-sacs* as well as a network of footpaths. The commercial core lacks the central park and crystal palace of Howard's imagination but instead provides retail spaces ranging from a Victorian arcade (reminiscent of Pullman), to a linear shopping street narrowed into a pedestrian and bus mall, to a

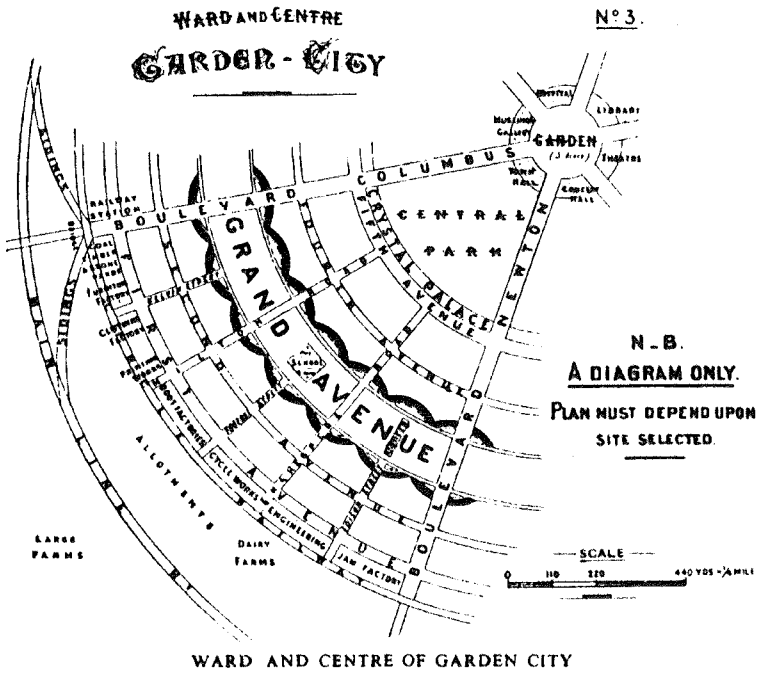


FIGURE 4-17 Howard's diagram of Garden City's "Ward and Centre."
(*Source: Osborn 1945/1965. Reproduced by permission of MIT Press.*)

contemporary shopping center. Letchworth remains protected by an agricultural greenbelt, albeit comprising only about 2,000 acres now.

In 1963, the original Letchworth corporation was replaced by a public corporation created by an act of Parliament at the request of the town inhabitants. The new corporation performs the same role as its predecessor as trustee for the local public welfare. Every year, it allocates sizable sums from excess land rents to social and cultural organizations in Letchworth.

Howard's hope that garden cities would proliferate once their potential was demonstrated was dashed by depression, war, and the spread of less planned suburbs in Great Britain and the United States. The garden city thesis, as promoted by F. J. Osborn and the Town and Country Planning Association, however, substantially influenced the global postwar New Towns and Greenbelt programs. The British New Towns and their counterparts in France, India, the Soviet Union, Hong Kong, and elsewhere scarcely resemble Letchworth in scale or form of organization. They are predominantly high-rise, publicly constructed communities with populations far exceeding 32,000. Yet the elements of unified ownership and control of land, their mixture of functions, and their goal of metropolitan decongestion are faint echoes of Howard's third magnet.

Conclusion

This chapter has surveyed three approaches to the problems of rapid urbanization during the nineteenth century: (1) regulation of building and sanitary conditions, (2) redevelopment and expansion of urban infrastructure, and (3) relocation of factory workers to planned model communities in nonurban settings. The first two approaches involved primarily governmental actions. The third approach involved private initiatives taken by well-meaning individuals of widely differing backgrounds and motivations. All three, however, required the development of new legal measures, authorities, and doctrines to modify the existing abusive practices of urban development.

Each of these three approaches in turn served as precedent for more expansive intervention into the private land market by government during the twentieth century. Regulation would lead directly to the zoning movement that began just after World War I and continues today. Regulation also proliferated in the various public programs of environmental management concerned with clean air and water, wetlands, toxic wastes, pesticides, and many other issues. Redevelopment emerged after World War II as the focus of the public urban renewal programs

and its various offshoots. Relocation has been the self-selected strategy of millions of central city residents who have moved to suburban areas or back to the hills and byways of rural America. Although not overtly a governmental policy, many laws and programs (e.g., the interstate highway system and federal tax benefits for home ownership) have contributed to the impetus to abandon older central cities. The next two chapters continue this chronology of the evolution of cities, land use, and society through the twentieth century.

References

Allen, N. 1986. *David Dale, Robert Owen, and the Story of New Lanark.* Edinburgh: Moubray House Press.

Ashworth, W. 1954. *The Genesis of Modern British Town Planning.* London: Routledge and Kegan Paul.

Benevolo, L. 1967. *The Origins of Modern Town Planning.* Trans. J. Landry. Cambridge, MA: MIT Press.

Blake, N. M. 1956. *Water for the Cities.* Syracuse, NY: Syracuse University Press.

Booth, M. L. 1860. *History of the City of New York.* New York: W. R. C. Clark and Meeker.

Bridenbaugh, C. 1964. *Cities in the Wilderness.* New York: Capricorn Books.

Buder, S. 1967. *Pullman: An Experiment in Industrial Order and Community Planning, 1880–1930.* New York: Oxford University Press.

Caro, R. A. 1974. *The Power Broker.* New York: Knopf.

Chadwick, G. F. 1966. *The Park and the Town: Public Landscape in the 19th and 20th Centuries.* New York: Praeger.

Chapman, B. 1953. Baron Haussmann and the Planning of Paris. *Town Planning Review* 24:177–92.

Chapman, J. M., and B. Chapman. 1957. *The Life and Times of Baron Haussmann: Paris in the Second Empire.* London: Weidenfeld and Nicolson.

Cole, M. 1953. *Robert Owen of New Lanark.* London: Batchworth Press.

Davis, T. 1966. *John Nash: The Prince Regent's Architect.* London: Country Life.

Fabos, J. Gy., G. T. Milde, and V. M. Weinmayr. 1968. *F. L. Olmsted, Sr.: Founder of Landscape Architecture in America.* Amherst: University of Massachusetts Press.

Fishman, R. 1977. *Urban Utopias in the Twentieth Century.* New York: Basic Books.

Flinn, M. W., ed. 1965. *Edwin Chadwick's Report on the Sanitary Condition of the Labouring Population of Great Britain.* Edinburgh: Edinburgh University Press.

Giedion, S. 1962. *Space, Time, and Architecture.* Cambridge, MA: Harvard University Press.

Hayden, D. 1976. *Seven American Utopias: The Architecture of Communitarian Socialism, 1790–1975.* Cambridge, MA: MIT Press.

Jackson, K. T. 1985. *Crabgrass Frontier: The Suburbanization of the United States.* New York: Oxford University Press.

Jordan, D. P. 1995. *Transforming Paris: The Life and Labors of Baron Haussmann.* New York: Free Press.

Kutler, S. I. 1971. *Privilege and Creative Destruction: The Charles River Bridge Case.* New York: W. W. Norton.

MacFadyen, D. 1933/1970. *Sir Ebenezer Howard and the Town Planning Movement.* Cambridge, MA: MIT Press.

Mayer, H. M., and R. C. Wade. 1969. *Chicago: Growth of a Metropolis.* Chicago: University of Chicago Press.

Nesson, F. L. 1983. *Great Waters: A History of Boston's Water Supply.* Hanover, NH: University Press of New England.

Olmsted, F. L., Jr., and T. Kimball. 1928/1973. *Forty Years of Landscape Architecture: Central Park.* Cambridge, MA: MIT Press.

Osborn, F. S., ed. 1945/1965. *Ebenezer Howard's Garden Cities of To-Morrow.* Cambridge, MA: MIT Press.

Owen, R. D. 1874. *Threading My Way.* London: Turner.

Page, M. 1999. *The Creative Destruction of Manhattan: 1900–1940.* Chicago: University of Chicago Press.

Peets, E. 1927. Famous Town Planners: Haussmann. *Town Planning Review* 12:181–90.

Peterson, J. A. 1983. The Impact of Sanitary Reform upon American Urban Planning 1840–1890. In *Introduction to Planning History in the United States,* ed. D. A. Krueckeberg, 13–39. New Brunswick, NJ: Rutgers Center for Urban Policy Research.

Platt, R. H. 1994. From Commons to Commons: Evolving Concepts of Open Space in North American Cities. In *The Ecological City: Preserving and Restoring Urban Biodiversity*, eds. R. H. Platt, R. A. Rowntree, and P. C. Muick, 22–39. Amherst: University of Massachusetts Press.

———. 1995. The 2020 Water Supply Study for Metropolitan Boston: Demise of Diversion. *Journal of the American Planning Association* 61 (2): 185–99.

———. 2000. Ecology and Land Development: Past Approaches and New Directions. In *The Practice of Sustainable Development*, ed. D. R. Porter, 25–52. Washington, DC: Urban Land Institute.

Rasmussen, S. E. 1967. *London: The Unique City.* Cambridge, MA: MIT Press.

Reisner, M. 1986. *Cadillac Desert: The American West and Its Disappearing Water.* New York: Penguin.

Riis, J. A. 1890/1972. *How the Other Half Lives.* Williamstown, MA: Corner House.

Rosen, G. 1958. *A History of Public Health.* New York: MD Publications.

Saalman, H. 1971. *Haussmann: Paris Transformed.* New York: George Braziller.

Smith, E. R. 1907. Baron Haussmann and the Topographical Transformation of Paris under Napoleon III. *Architectural Record* 21–38.

Summerson, J. 1962. *Georgian London.* Baltimore: Penguin.

Sutton, S. B., ed. 1971. *Civilizing American Cities: A Selection of Frederick Law Olmsted's Writings on City Landscape.* Cambridge, MA: MIT Press.

Weber, A. F. 1899/1963. *The Growth of Cities in the Nineteenth Century: A Study in Statistics.* Ithaca, NY: Cornell University Press.

Weidner, C. H. 1974. *Water for a City.* New Brunswick, NJ: Rutgers University Press.

Whitehill, W. M. 1968. *Boston: A Topographic History.* 2nd ed. Cambridge, MA: Harvard University Press.