

INTRODUCTION



Since human beings have inhabited the earth, they have generated, produced, manufactured, excreted, secreted, discarded, and otherwise disposed of all manner of waste. Among myriad types of rejectamenta, refuse—solid waste—has been one of the most abundant, most cumbersome, and potentially most harmful. Beginning with ancient civilizations, there has always been refuse. There has not always been a refuse problem, however, at least not one of the magnitude that has developed in modern times. Simply to equate poor sanitation with the age of a society is to overlook the major factors that produce a refuse problem with serious health and environmental repercussions.

Refuse is primarily an urban blight. Agrarian societies throughout history have successfully avoided solid waste pollution; cities and towns have faced the gravest dangers. Although varying in degree and intensity, the urban refuse problem is exacerbated by limited space and dense populations. A refuse problem must be understood by those affected by it to have negative effects on human life. The problem may be seen at first as merely a nuisance or annoyance, and only later as a health hazard or part of a broader environmental crisis. It is the modern industrial society, not the ancient society, that has experienced the most intense refuse problem. With the Industrial Revolution in Europe and the United States came the manufacture of material goods on a large scale and attendant pollutants.

With the emergence of modern metropolises, people concentrated in urban areas as never before. The modern urban-industrial society, however, also developed its own brand of environmental consciousness and civic awareness.

Garbage in the Cities focuses on the refuse problem in industrial and postindustrial America. Because of the nation's rapid growth and rising affluence, the magnitude of the waste production has been staggering in the nineteenth and twentieth centuries. The first six chapters of the book concentrate on the period between 1880 and 1920, beginning with a decade in which citizens first became interested in the "garbage nuisance," and ending soon after World War I, when the priorities of war distracted attention from almost every municipal problem. The American experience with refuse pollution was formative during this era. It was linked, in part, to the European experience, but it was also the result of a unique set of circumstances that produced the affluent, wasteful society whose material progress became the envy of the world. The last two chapters concentrate on the period after 1920, and explore the ways in which the refuse problem—and how Americans addressed it—evolved over time and continues to evolve.

In order to place in perspective the nature and extent of the American refuse problem, it is helpful first to trace the impact of waste on human society from ancient times through the Industrial Revolution in Europe. The historic connection between refuse and urbanization is apparent within this context, as is the significance of local circumstance and popular and institutional attitudes toward waste.

With the shift from hunting and gathering to food producing around 10,000 BC, human beings began to forsake the nomadic life for more permanent settlements, thus laying the groundwork for the first urban sites. In time, the demands of this new lifestyle produced many challenges, including the need for improved methods of waste disposal. On-site dumping and natural decomposition would never do; casual rural habits could not be tolerated in denser urban environs.

New ways of dealing with discards progressed slowly, however. In ancient Troy, wastes were left on the floors of homes or simply thrown into the streets. In parts of Africa, similar habits prevailed to the point where street levels rose and new houses had to be constructed on higher ground. As Lewis Mumford graphically stated, "For thousands of years city dwellers put up with defective, often quite vile, sanitary arrangements, wallow-

ing in rubbish and filth they certainly had the power to remove, for the occasional task of removal could hardly have been more loathsome than walking and breathing in the constant presence of such ordure. If one had any sufficient explanation of this indifference to dirt and odor that are repulsive to many animals, even pigs, who take pains to keep themselves and their lairs clean, one might also have a clue to the slow and fitful nature of technological improvement itself, in the five millennia that followed the birth of the city.”¹ This bleak portrayal suggests a lack of resolve by ancient civilizations to promote good sanitation. While the general state of uncleanness was appalling in many locations, there were several examples to the contrary. Ancient Mayans in the New World placed their organic waste in dumps and used broken pottery and stones as fill. In the Indus River Valley city of Mohenjo-Daro (founded about 2500 BC), a precedent-setting experiment in central planning led to the construction of homes with built-in rubbish chutes and trash bins. The city also had an effective drainage system and a scavenger service. The residents of Harappa, in the Punjab in eastern Pakistan, equipped their homes with bathrooms and drains. Excavations of ancient Babylon, Greece, and Mesopotamia revealed drains, cesspools, and sewerage systems. Carthage and Alexandria also had well-constructed sewers. In the Egyptian city Heracleopolis (founded before 3000 BC), the wastes in the nonelite quarters were ignored, but in the elite and religious quarters, efforts were made to collect and dispose of all wastes, which usually ended up in the Nile. In Crete, a most advanced civilization in terms of sanitation, the homes of the Sea Kings had bathrooms connected to trunk sewers by 2100 BC, and by 1500 BC, the island had areas set aside for the disposal of organic wastes. Records of China dating from the second century BC indicate forces of sanitary police who were charged with removing animal and human carcasses and traffic police who oversaw, among other things, street sweeping in the major cities.²

Religion, as well as utilitarian and social conventions, played a major role in the establishment of sanitary practices in the ancient world. Most notable were the Jewish laws of cleanliness, likely derived from Minoan, Assyrian, Babylonian, Indian, and Egyptian origins. About 1600 BC, Moses wrote a code of sanitary laws that was perpetuated and enlarged upon through the centuries. Every Jew was expected to remove his own waste and bury it far from the living quarters. Later, the Talmud ordered the streets of Jerusalem to be washed daily, a severe law in such an arid region.

Like a number of other ancient cities conscious of health and sanitation needs, Jerusalem also had a sewer system and its own water supply as early as 800 BC.³

The achievements of Mohenjo-Daro, Harappa, and Jerusalem—as well as other cities—did not produce a universal standard of cleanliness in the ancient world. Into the classical period, refuse problems plagued even the high culture of Athens. In the fifth century BC, garbage and other accumulated waste cluttered the city's outskirts and threatened the Athenians' health. On balance, however, the Greeks made some important contributions to sanitation. About 500 BC, Greeks organized the first municipal dumps in the Western world. (The municipal dumps bordering the city also became sites for abandoning unwanted babies.) The Council of Athens began enforcing an ordinance requiring scavengers to dispose of wastes no less than one mile from the city walls. Athens also issued the first known edict against throwing garbage into the streets.⁴

Rome, because of its size and dense population, faced sanitation problems unheard of in Greece. The city was effective in dealing with water, sewerage, and some public health matters. The Cloaca Maxima—a large underground conduit—was an outstanding example of a drain used in a civilization more than two thousand years ago. And in addition to building the famous aqueduct system, the Romans supervised public baths, houses of prostitution, and wine-drinking establishments. They also regulated food vendors. By the end of the reign of Augustus Caesar in AD 14, Rome had an effective public health administration.

Although well organized by pre-nineteenth-century standards, refuse collection and disposal were deficient for Rome's needs. The volume of waste was staggering, yet municipal collection was restricted to state-sponsored events, such as parades and gladiatorial games. By law, property owners were responsible for adjacent streets, but enforcement of the law was lax. The wealthy employed slaves to collect and dispose of waste, and independent scavengers collected garbage and excrement to be resold as fertilizer. Open dumping remained the standard disposal practice, despite all of its obvious shortcomings. In a city of approximately one and one-quarter million people, the waste problem far exceeded the means to deal with it. Well before the Fall of Rome, the city became incredibly unhealthy and dirty. Ironically, as Rome experienced a population reduction to about twenty thousand in the thirteenth century, and as the rest of the Western world similarly deurbanized, the breakdown of sanitation services had a more localized impact.⁵

The persistent clichés that cast the medieval period as the Dark Ages with recurrent plagues suggest that Europe became a vast garbage dump after the Fall of Rome. Such generalizations are overstated. The population of Europe was scattered and was spared the massive waste problem Rome experienced in classical times. Despite the crudity of medieval dwellings and living conditions, sparsely populated areas did not have to contend with the refuse pollution experienced in the great cities of the past. With the rise of medieval cities, conditions were gradually improved. According to public health historian George Rosen, “All the institutions needed for a hygienic mode of life had to be created anew by the medieval municipalities. It was within this urban environment that public health, thought, and practice revived and developed further in the medieval world.”⁶

All of the basic needs—safe water, sewerage, and so forth—had to be met by a new urban society. The collection and disposal of waste was a particularly difficult problem at a time when rural habits were being reintroduced into town life. Hogs, geese, ducks, and other animals shared the urban habitat with human beings. By the thirteenth century, the larger European cities were once again coming to grips with refuse. Cities began paving and cleaning their streets at the end of the twelfth century. Paris began paving its streets in 1184, when, according to contemporary accounts, King Philip II ordered the streets to be paved because he was annoyed by the offensive odors emanating from the mud in front of his palace. Augsburg became the first city in Germany to pave its streets, though not until 1415. Street cleaning at public expense came some time later—in 1609, for example, in Paris. In the German principalities, street-cleaning work was often assigned to Jews and to the servants of the public executioner. It was hardly an ennobling profession.⁷

Waste collection and dumping in medieval cities have a varied history. In 1388, the English Parliament banned waste disposal in public watercourses or ditches. Paris had a very unusual experience with the refuse problem. In 1131, a law was passed prohibiting swine from running loose in the streets after young King Philip, son of Louis the Fat, was killed in a riding accident caused by an unattended pig. The monks of the Abbey of Saint Anthony protested the law, and were granted a dispensation because their herds of swine were a major source of income. The controversy over allowing animals to run free raged on for years, however. Until the fourteenth century, Parisians were allowed to cast garbage out their windows, and although several attempts were made at effective collection and

disposal, by 1400 the mounds of waste beyond the city gates were so high that they posed an obstruction to the defense of Paris. One ingenious regulation provided that whoever brought a cart of sand, earth, or gravel into the city had to leave with a load of mud or refuse. Little by little, the people of medieval Europe were becoming aware of waste as a health hazard. Public resistance to new regulations was strong, however, and primitive collection and disposal methods were widespread. No adequate solution was in sight. The steady transition of the medieval towns into modern cities, with multistory tenements, high concentrations of people and business establishments, and growing quantities of inorganic as well as organic wastes exacerbated the problem.⁸

Until the transition of Europe from a predominantly agrarian to an urban-industrial culture, the refuse problem remained much as it had been in the Middle Ages. Although the Renaissance brought a revival of classical art to Europe and heralded a new era of rationalism, early modern Europe did not undergo a sufficient physical or demographic change to influence the development of new methods to cope with waste. Change was gradual until the onset of the Industrial Revolution. Only in the major cities could the rudiments of a sanitation system be found. Most people continued to discard garbage and rubbish helter-skelter. In Edinburgh, regarded by many as the filthiest city in all of Europe, citizens cast garbage into the streets in the evening, hoping that the scavengers would collect it the next morning. In Naples, the breakwater sheltering moored vessels was so badly clogged by 1597 that city leaders almost decided to build a new breakwater rather than clean the old one. Cities continued to pass laws and ordinances against the most unsanitary practices, but to little avail. The plagues that invaded Europe between 1349 and 1750 provided some inducement for better sanitation, but responsibility largely remained an individual matter well into the nineteenth century.⁹

The Industrial Revolution, which originated in England in the 1760s, brought down the old order in Europe, replacing it with a new one characterized by vast economic expansion and rapid urbanization. The major physical consequence of the Industrial Revolution was the tremendous environmental change in the cities. As never before, urbanites were forced to confront massive pollution in many forms. In this context, the refuse problem emerged as a major blight.¹⁰

Historian Eric E. Lampard suggested that the Industrial Revolution was “a particular form of social change” and that its occurrence “transcends explanation in purely economic terms.” Lampard argued that the

first phases of the Industrial Revolution produced a kind of “disorder” rather than an instantaneous new order; the gradual nature of the change distressed and bewildered town and country people alike.¹¹ During the transition from a preindustrial to an industrial society, dislocations, distress, instability, and uncertainty of change shook the people to their roots. The transition from rural to urban, from agrarian to industrial, had a similar impact on the physical environment.

The effect of the Industrial Revolution on urban society was not all negative, but its imprint on the physical city was often grim. Mumford has written that “industrialism, the main creative force of the nineteenth century, produced the most degraded urban environment the world had yet seen; for even the quarters of the ruling classes were befouled and overcrowded.”¹² Asa Briggs, in more measured but also critical words, observed, “The worst aspects of nineteenth-century urban growth are reasonably well known. The great industrial cities came into existence on the new economic foundations laid in the eighteenth century with the growth in population and the expansion of industry. The pressure of rapidly increasing numbers of people, and the social consequences of the introduction of new industrial techniques and new ways of organizing work, involved a sharp break with the past. The fact that the new techniques were introduced by private enterprise and that the work was organized for other people not by them largely determined the reaction to the break.” He went on to say, “The priority of industrial discipline in shaping all human relations was bound to make other aspects of life seem secondary.”¹³ Neglect of the physical environment was to be expected in a society in which priorities were shaped by an “industrial discipline.”

The demographic shift in England profoundly affected city growth and led to serious problems of overcrowding. The English were the world’s first urbanized society. Twenty percent of the population lived in cities and towns of 10,000 or more by 1801, with one-twelfth of the people residing in London. By 1851, more than half of the English were city dwellers. At the beginning of the nineteenth century, only the Netherlands was more urbanized. During the reign of Queen Victoria (1837–1901), the population of Great Britain doubled, and the 1901 census indicated that 77 percent of the country’s 36 million citizens lived in urban areas.

The inability to house such a growing population led to serious overcrowding and sanitary problems. In 1843, in one section of Manchester there was one toilet for every 212 people. “It was impossible,” Lampard wrote, “for the nineteenth-century market-economy to house the grow-

ing, urbanizing, population in any but the most rudimentary way. Public and philanthropic efforts could do little more than advertise the ‘problem.’” Although the housing crisis eased somewhat after the turn of the century, all types of structures, including cellars and other dank places, were converted for human habitation. In Liverpool, one-sixth of the population lived in underground cellars. As late as the 1930s, London had 20,000 basement dwellings considered unfit for occupation. Many dwellings had insufficient ventilation, inadequate privies, and little or no sunlight.¹⁴

The crush of people and the concentration of industry in and around cities produced living and working conditions of incredible deprivation, especially for the poor and the working class. The pages of Charles Dickens overflow with graphic images of the wretchedness of life in the industrial city. Stinking water, smoky skies, ear-shattering din, and filthy streets made living conditions grim. Conditions in the factory were no better. The factory was “a new kind of prison; the clock a new kind of jailer.”¹⁵ The lessons of good sanitation and public health learned over the years were forgotten or ignored. Nuisance laws were rarely enforced, public health laws went unheeded, and in some quarters cleanliness was all but forgotten.¹⁶

The life of the urban poor and the working class reveals the neglect of sanitation and proper collection and disposal of waste. It suggests but one dimension of the growing waste problem in industrial-urbanized societies. As Lampard noted, industrial-urban nations are “effluent” societies.¹⁷ The growing production and consumption of goods made the scale and magnitude of the waste problem much greater than that encountered by previous cultures. Even if sanitary standards were improved to the point of rendering the unhealthy safe and the dirty clean, rising affluence, which brought still more production, would produce an ever-larger quantity of waste. The growth to maturity of an industrial society, therefore, was no guarantee that the refuse problem would decline, even though sanitary conditions might improve. The moderate rise in the standard of living and the improvement in living conditions in England by the time of the Great Exhibition in London in 1851 did not signal an end to the waste problem. Changes for the better simply meant that the most immediate unpleasant effects of the Industrial Revolution were subsiding.

In the mid-to-late nineteenth century, England could boast about reversing some of the most debilitating physical defects of the industrial city, especially poor sanitary and health conditions. The harshness of the industrial city could not be neglected forever. When the subtle became

painfully obvious, when the affluent were touched by some of the same misfortunes as those of the suffering poor, something was done. Several forces converged to halt the downward spiral of the environment. One of the most important was the “service revolution.” City services had been established over time to meet the most pressing needs: fire and police protection, water supplies, and even waste collection—largely by scavenging. Their growing size and the extent of their problems required industrial cities to supply many citywide services that had previously been provided selectively by volunteers or paid agents. Several scholars have argued that, along with the rise of laissez-faire capitalism, the nineteenth century also experienced a kind of “municipal socialism,” that is, a demand for services provided by the city rather than the individual. Although some scholars have exaggerated the range and quantity of services provided by this municipal socialism, the needs of the large, heterogeneous industrial city did force a rethinking of ways in which those needs could be met. One of the results of the new emphasis on citywide services was the development of rudimentary public works and public health agencies or departments.¹⁸

Another, and perhaps the most essential, factor in bringing about the first effort to improve sanitation in the industrial city was the emergence of modern public health science. Surveys undertaken by the Poor Law Commission, first in London and then throughout England, evaluated the health of the working population. In 1842, the commission published *Report on the Sanitary Condition of the Labouring Population in Great Britain* under the primary authorship of barrister-turned-sanitarian Edwin Chadwick. The document was well researched, well argued, and widely disseminated, and painted a vivid picture of urban blight and the lack of sanitary conditions throughout the country. The most significant feature of the report was the conclusion that disease, especially communicable disease, was related in some way to filthy environmental conditions (the exact connection would not become clear until the inception of the germ theory of disease after 1880). The establishment of the Sanitary Commission in 1869 and subsequent enactment of public health laws provided the foundation for environmental sanitation that led to a reduction in urban disease. With the advent of the “sanitary idea” and ultimately with modern science and information-gathering procedures brought to bear on public health, conditions in industrial England began to improve. Similar programs in other parts of Europe and in the United States signaled a new “age of sanitation.” The emergence of bacteriological science and the rise

of the germ theory of disease led to the discrediting of environmental sanitation as the sole means of curbing communicable diseases. Nonetheless, these first steps offered immediate, and in some cases dramatic, relief from some of the ravages of the urban environment. The industrial city had not been brought under control, but at least the most obvious environmental hazards were being confronted.¹⁹

While Europe was in the midst of its Industrial Revolution, the United States was emerging as a new nation. Many of the difficult lessons learned in the industrial cities of Europe had little applicability in the colonial society of North America. Some aspects of the European experience with sanitation problems were transmitted to the New World, but not in ways that would help Americans avoid those problems. The evolution of American society established a different context for dealing with health and sanitation.

Preindustrial America was a highly decentralized society, but from the beginning it had some form of urban life. Indeed, cities and towns played central roles in establishing American traditions, in fostering a strong economy, and in providing staging areas for territorial expansion. The importance of American cities and towns was disproportionate to their size. From the early seventeenth century until the eve of America's own industrial revolution in the mid-nineteenth century, the total urban population remained small, as did the physical size of the cities. The first federal census of 1790 showed that city dwellers represented only 5.1 percent of the population, and only two cities exceeded 25,000. By 1840 the urban population had increased to 10.8 percent, and only New York exceeded 250,000. Between 1790 and 1840, however, the number of cities increased from 24 to 131.²⁰

What distinguished the American experience with sanitation problems from the European experience during a comparable period of growth were factors of space and magnitude. In the American colonies, the abundance of land and natural resources such as water supplies mitigated massive sanitation problems even in cities and towns. Since no American city reached the size of London during that period, the need to deal with health and sanitation problems on a grand scale did not materialize. That is not to say that American cities were free of refuse and poor sanitation—only that any parallels between the two societies must be drawn with an understanding of local conditions.²¹

American cities periodically experienced appalling sanitary and health problems. Carl Bridenbaugh wrote that in colonial times the casting of

rubbish and garbage into the streets was “a confirmed habit of both English and American town-dwellers.” In the condition of streets, however, “colonial villages vied with, but never equaled, the filthiness prevalent in contemporary English towns,” though the swine roaming the streets scavenging for food and causing obstructions to people and horses were reminiscent of scenes in most European villages.²² In eastern cities, where crowding became a chronic problem as early as the 1770s, the streets reeked with waste, wells were polluted, and deaths from epidemic disease mounted rapidly. Even in the burgeoning cities in the West and South, problems were sometimes legion. As late as the 1860s, Washingtonians dumped garbage and slop into alleys and streets, pigs roamed freely, slaughterhouses spewed nauseating fumes, and rats and cockroaches infested most dwellings—including the White House. No wonder the infant mortality rate was very high in the capital city.²³

Because of the time differential, preindustrial American cities benefited earlier and more quickly from sanitary sciences than did their counterparts in Europe. The connection between filth and disease was dogma. In colonial cities, removal of waste and street cleaning were considered effective ways of preserving public health as well as eliminating nuisances. By the mid-nineteenth century, several cities had established boards of health and had passed ordinances against indiscriminate dumping of refuse and the free roaming of animals.²⁴

These measures alone were not enough to curb the problem of waste or to maintain consistently high standards of sanitation. Environmental sanitation alone could not protect cities from epidemics; until the development of the science of bacteriology, cities were constrained to deal with them. Ordinances were not reinforced with adequate inspections, surveillance, or policing to ensure the compliance of citizens. City leaders' concern for cleanliness was not always matched by their constituents' concern.²⁵

The quality of sanitation in preindustrial America was determined largely by local circumstances. Some city leaders had the foresight to place a high priority on city cleanliness, while others ignored the problem. Epidemics ravaged several cities, while others were spared because of their relative isolation or because of attention to comprehensive sanitary measures. While rudimentary public works systems emerged in several of the larger or more progressive communities, individuals or private scavengers handled the waste problems in many towns and villages. Little progress was made in establishing clear lines of responsibility for collection and

disposal of refuse, except in New York and Boston, and even in New York advances were slow in coming. The burghers of New Amsterdam had been among the first to pass laws against casting waste into the streets (1657), but the condition of the streets remained the responsibility of the householders. In the late eighteenth and early nineteenth centuries New York City established municipal control over several sanitary services, but jurisdictional disputes between state and local governments and between city and individuals continued. The time for comprehensive community-wide programs and general environmental reform had not yet arrived. Americans must have found it difficult to comprehend the massive pollution problems confronting industrial London, if they heard about them at all. They must have found it even more difficult to anticipate that similar problems would threaten them in the not-too-distant future.²⁶

The impact of the Industrial Revolution on American cities was no less severe than its impact on European cities had been. Like Europe, the United States experienced an array of environmental problems—smoke, noise, and tainted water—if not for the first time, at the very least in greater intensity than before. Also like Europe, the United States was confronted with a waste problem in its industrial era that had two distinct dimensions. One was linked to the physical distress caused by overcrowding, poor sanitation, and primitive methods of collection and disposal, especially in the late nineteenth and early twentieth centuries; the other was tied to the rising affluence of the middle class, abundance of resources, and consumerism, which persisted well into America's postindustrial era in the late twentieth century. Of course, it is best to keep in mind that forces other than industrialization also influenced various forms of pollution and the waste problem, including agricultural cultivation, transmittal of epidemic diseases, a variety of technical choices in the non-industrial sectors of society, and urban processes not attributable to industrial activity.

Industrialism in the United States, however, went hand in hand with the transformation of the country into an urban nation. As early as 1820, there was a significant link between urban development and industrial growth. From 1840 to 1920, the urban population grew from 1,845,000 to over 54 million. This represented at least 29 percent growth in each decade and as much as 92.1 percent growth between 1840 and 1850. The number of urban areas also grew at a fast pace—from 131 in 1840 to 2,722 in 1920, extending across the country.²⁷

During this period of remarkable growth, especially between 1870 and

1920, the industrial city was a dominant urban form. Densely populated, physically expansive, and economically vital, the industrial city was characterized by outward expansion, an ever-rising skyline, and specialized land use in the form of well-defined business and residential districts. Relatively new cities with strong industrial economies such as Cleveland, Pittsburgh, and Milwaukee began experiencing rapid population growth and economic prosperity. Industrialization also transformed, and attracted factories to, many older commercial or preindustrial cities such as Boston, Baltimore, Philadelphia, and New York.²⁸

Industrial cities paid a high price for their rapid population growth and economic dynamism. They experienced crowded tenement districts, chronic health problems, billowing smoke, polluted waterways, traffic congestion, unbearable noise, and mounds of putrefying garbage. Americans were unprepared to deal with the extent of these pollutants and the rapid transformation of the United States into an urbanized nation.

By 1885, the need for a plentiful and inexpensive source of energy to run factories and to heat homes led to the extensive use of coal. Bituminous (soft) coal was the most widely used; only a small portion of it was consumed in the generating of power and heat, and most of the residue went directly into the air, encrusting buildings, clothing, and the lungs of city dwellers.²⁹

The concentration of factories in and around cities added to environmental problems. Iron and steel mills, textile mills, and chemical plants were often constructed near waterways, mainly because of the large quantities of water needed for steam conversion and for chemical solution manufacturing. Waterways also proved useful for disposing of wastes. A 1900 study suggested that 40 percent of the pollution load on American rivers was industrial in origin. Manufacturers contributed substantially to land pollution as well, dumping heaps of rubbish, garbage, slag, ashes, and scrap metal on available vacant land. Slaughterhouses and other animal-processing industries dumped animal wastes in open pits or on vacant lots; tanning companies polluted waterways by washing hides in them. The noise produced by large factories could deafen workers and disrupt surrounding residential neighborhoods.³⁰

The numbers of factories and the dense concentration of industries around cities turned many nuisances into full-fledged environmental disasters. By 1899, 40 percent of the 500,000 industrial establishments in the country were factories. At least three-fourths of American manufacturing was concentrated in New England, the mid-Atlantic states, and the north-

central states. By 1900, thirty-four of the forty-four states were manufacturing more than 50 percent of their goods in urban areas; in eighteen states more than 75 percent of the products came from urban factories. Industrial specialization added to this high concentration. For instance, the highly polluting iron and steel industry was concentrated in the greater Pittsburgh area, and, not surprisingly, the amount of smoke was stifling. Chicago, Saint Louis, and Kansas City led the nation in slaughtering and meatpacking, and the citizens suffered a great deal from the festering wastes and noxious odors.³¹

Sizeable human concentrations in the industrial cities exacerbated the environmental problems. The rapid population growth of the United States and its cities during this period is well known. Between 1850 and 1920, while the world population increased by 55 percent, the population of the United States soared by 357 percent. The most phenomenal growth occurred in the cities, primarily because of immigration and rural-to-urban migration. During this period, nearly 32 million people entered the United States, most of them from southern and eastern Europe. By 1910, 41 percent of American city dwellers were foreign-born. About 80 percent of the new immigrants settled in the Northeast. Migration from rural areas of the country was also impressive. Although statistics are scant, a conservative estimate is that 15 million rural people moved to the cities between 1880 and 1920. During those years, the rural population fell from 71.4 percent to 48.6 percent.³²

Statistics can measure the magnitude of these shifts in population, but they cannot measure the human dimension of the attendant environmental problems. Many city dwellers in the industrial cities lived and worked in oppressive social and physical surroundings. It is almost impossible to comprehend the overcrowding in some cities. From 1820 to 1850 the average block density in lower Manhattan increased from 157.5 to 272.5 persons. In 1894, New York City's Sanitary District A averaged 986.4 people an acre in thirty-two acres, which translated to 300,000 people in a space of five or six blocks. Bombay, India, the second-most crowded area in the world, had 759.7 people an acre; Prague, the European city with the worst slums, had 485.4 people an acre.³³

Jane Addams, in *Twenty Years at Hull-House*, recalled the seeming disregard for the crowded and inferior living conditions of those years, "The mere consistent enforcement of existing laws and efforts to their advance often placed Hull-House, at least temporarily, into strained relations with its neighbors. I recall a continuous warfare against local landlords who

would move wrecks of old houses as a nucleus for new ones in order to evade the provisions of the building code, and a certain Italian neighbor who was filled with bitterness because his new rear tenement was discovered to be illegal. It seemed impossible to make him understand that the health of the tenants was in any wise as important as his undisturbed rents.”³⁴

Jacob Riis, in *How the Other Half Lives*, wrote, “Thousands were living in cellars. There were three hundred underground lodging-houses in the city when the Health Department was organized. Some fifteen years before that [about 1852] the old Baptist Church in Mulberry Street, just off Chatham Street, had been sold, and the rear half of the frame structure had been converted into tenements that with their swarming population became the scandal even of that reckless age.”³⁵

Appalling stories of overcrowding, like David Brody’s example about the thirty-three Serbian workers and their boss who lived in a five-room house, or the common practice of keeping farm animals in basements and even slaughtering them there, were all too familiar.³⁶

In such surroundings, health problems, disease, and high mortality rates were to be expected. Typhoid spread throughout New Orleans from sewage standing in unpaved streets. In 1873, Memphis lost nearly 10 percent of its population to yellow fever. Mortality figures for “Murder Bay,” a black district in Washington, D.C., not far from the White House, were twice as high as those for white neighborhoods. The residents of that slum lived in ghastly surroundings, picking their dinners out of garbage cans and dumps. By 1870, conditions in New York City had deteriorated so badly that infant-mortality rates were 65 percent higher than those of 1810. Correlations between living conditions and disease in tenements led to some understanding of the debilitating effects of a bad environment on health, but improvements would not come quickly.³⁷

Even the elite were not completely insulated from the environment of the industrial city. The crush of human beings, the concentration of factories, and the expansion of the city affected everyone. Even the wealthy banker had to endure the trip from his country estate to his downtown office. The new urban environment challenged every Jeffersonian notion of individuality and self-reliance. Yet the need to confront the most immediate environmental problems was at hand, and urbanites needed to meet this challenge.

The first efforts to resolve the environmental crisis were directed piecemeal at the most obvious concerns. Thus the needs for sources of pure

water and adequate sewerage received top priority because they affected citizens collectively and were vital for good health. To the credit of many cities, effective programs to tap pure water sources and construct modern sewer systems were underway by the 1870s. Efforts to control smoke pollution and excessive noise lagged far behind and did not gain momentum until the mid-1890s. Such problems were more elusive, more difficult to gauge and measure, and even more difficult to monitor and control. Smoke came to symbolize material progress and the economic activity vital to the growth of industrial cities and the nation. Noise also seemed to indicate a society on the move. Only when the skies remained black with soot and the din made it difficult to think, eat, or sleep did the reformers gain public and official support.³⁸

The refuse problem gained public recognition as an environmental issue soon after the efforts to assure clean water and adequate sewerage in the early 1880s, and just before the first attempts to abate smoke and excessive noise in the mid-1890s. At first it was considered a mere nuisance, but by the 1890s the garbage problem was recognized as a major pollutant of the industrial era. Between 1880 and 1920, American cities began coping effectively with the immediate threats caused by refuse but failed to confront the more fundamental problems associated with the production of wastes. Not until the 1960s and 1970s did Americans link the resolution of the refuse problem to American affluence and the consumption of goods. Yet, by the onset of the twenty-first century, Americans were still trying to learn how to *manage* the solid waste problem, not *solve* it.