CHAPTER ONE

INTRODUCTION

I often begin my courses on the urban environment with the following question, "What is the difference between an anthill and a city?" Some students get a quizzical look on their faces. Others seem to be caught by surprise. After a reasonable period of silence, I simply answer, "Nothing." This usually sets off a round of comments and debate—just what I was looking for.

My point is at once simple, but nonetheless central to placing the city in the physical world. Why should the product of human labor be regarded as fundamentally different from that of other living organisms? Why should a city not be viewed like an anthill? A beaver dam? A prairie dog town? Of course, there is a little facetiousness and mischief in my query, but some obvious comparisons exist. Anthills provide protection from the weather and from predators. They incorporate living and working quarters, transportation networks, and food storage capability. But even when the comparisons run out and we begin to refine the distinction between homo sapiens and the rest of the animal world, we are left with at least one major truism: Cities should not be totally excluded from our understanding of the natural world. Doing so loses the opportunity to examine urban history from an ecological perspective.

The Cary Conference VII, sponsored by the Institute of Ecosystem Studies in Millbrook, New York, in April 1999, was devoted to urban ecology. The conference rationale and goals noted, "Nowhere on earth is the challenge for ecological understanding greater, and yet more urgent, than in those parts of the globe where human activity is most intense—

cities." By viewing cities as ecosystems—with physical, biological, and social structure, the rationale went on, "We bring urban areas into the realm of ecology and ecological understanding. . . ."[1] This vantage point helps to connect cities to the rest of the world and to appreciate their relationship with nature. It does not suggest, however, that cities are organic entities, that they are closed systems with unyielding metabolisms and little dependence on external forces. It does suggest that for us to understand cities as part of the world, we need not create rigid distinctions between "the natural environment" and "the built environment."

William Cronon and his colleagues in *Uncommon Ground: Rethinking the Human Place in Natur e* have gone a long way in reorienting our thinking about the place of humans in the natural world. As Cronon stated:

> It is simply that "nature" is a human idea, with a long and complicated cultural history which has led different human beings to conceive of the natural world in very different ways. Far from inhabiting a realm that stands completely apart from humanity, the objects and creatures and landscapes we label as "natural" are in fact deeply entangled with the words and images and ideas we use to describe them.[2]

As "a profoundly human construction," Cronon concluded, nature "is not nearly so natural as it seems. . . . If we allow ourselves to believe that nature, to be true, must also be wild, then our very presence in nature represents its fall. The place where we are is the place where nature is not." These observations clearly are meant to reconnect humans to their place in the physical world. Even in Cronon's view, however, there is a wide chasm between human civilization and wilderness. Agriculture is "a profoundly unnatural enterprise" because humans manipulate landscapes and growing seasons. Urban-industrial society is clearly beyond the borders of wilderness.[3]

Ultimately the view Cronon espoused helps to close the gap between placing urban society outside of the natural world and, on the other extreme, viewing cities as just another ecosystem. He made this point quite clear in *Nature's Metropolis* by suggesting the symbiotic relationship that exists between city and countryside as a result of commodity flows through which resources of various kinds from the hinterland are transformed into a variety of products in the city.[4] Nevertheless, cities still inhabit that "otherness'" that makes them neither of nature nor a product of humans acting "naturally" in nature.

Samuel P. Hays has tried to find a place for cities in environmental history by focusing on the urban process. As he said, "The history of the past century or more is the history not of cities but of the evolution of an urbanized soci-

ety."[5] He postulated that cities are central to the study of environmental history in several ways. Cities place pressure on a finite environment, interact significantly with rural environments (or the countryside), and also act as a starting point for new attitudes about the environment in general.[6] The first point Hays shares with several other scholars; the latter two are closely linked to, among others, Cronon's view. Like others, Hays called for examining the environment "internal to the city" as well as how cities "reached out to influence the wider countryside" and the effects of this outreach on "environmental transformation of that wider world."[7]

Overall, however, Hays's questions still lead from the presumption that cities are relatively unique, environmentally speaking, and require explanatory modes to place them in the larger context of environmental history. While cities are not anthills or organisms, they do not simply reside in a separate space and time dimension as fabrications in defiance of natural processes. Cities are places where humans live, work, play, consume goods, and make waste. Humans carry out or have carried out the same functions in caves, on farms, in villages, or even in space stations circling the earth. It may be time to look at cities for what they share with natural processes and other communal relationships rather than for how they differ.[8] I agree with Jonathan J. Keyes, who suggested, "The environmental take on cities . . . offers new ways to measure urbanism." It is partly a question of "angle of attack." For the most part, urban historians "departed from an interest in the problems of the city, not the environment." At the same time, environmental historians study the city to help define the place of nature in human life, to break down the myth that cities "are not involved with nature or have no bearing on the natural world."[9]

My own intellectual journey into the urban environment over the past twenty-five years or so has led me back to where I began—questioning how cities fit into the physical world—and trying to take seriously the question "What is the difference between an anthill and a city?" Unfortunately, this odyssey has yet to provide enough answers to satisfy me, or even to stimulate enough good questions. But I have made a start, as have Joel Tarr, Sam Bass Warner Jr., Harold Platt, Christine Rosen, Craig Colten, Andrew Hurley, Stanley Schultz, Clay McShane, Mark Rose, Maureen Flanagan, Chris Hamlin, Josef Konvitz, John Cumbler, Dolores Greenberg, Louis Cain, Jon Peterson, Sarah Elkind, and relative newcomers Adam Rome, Ellen Stroud, David Stradling, and others, who all contribute to the discourse.

I have placed the bulk of my work in the urban-industrial society of the

United States in the nineteenth and twentieth centuries. The impact of industrial processes on the economic, political, social, and environmental life of the nation was and remains profound. The rise of the industrial city and its counterparts was a transforming event in the nineteenth and early twentieth centuries, dramatically altering urban life and life in the surrounding hinterland. The twin forces of industrialization and urbanization were equally important environmental events with a complex array of results. What an incredible place and time to consider the role of humans in the physical world.[10]

Having grown up in suburban northern California, lived in small-town Montana, spent much of my adult life in urban Texas, and traveled widely throughout Europe, I have become very conscious of place. If I were to choose, I would identify myself as an environmental historian with a passion for studying cities. That is my angle of attack. My intellectual journey into the urban-industrial environment began in the fall of 1971, at the University of Texas, in H. Wayne Morgan's graduate seminar on the Gilded Age. Morgan introduced me to graphic images of urban squalor and what he believed to be the intimate connection between industrialism and urban environmental degradation. One of his works, *Industrial America: The Envir onment and Social Problems, 1865–1920* (one of the very early historical statements on the urban-industrial environment), outlined many of the issues he had raised in class, including the notion that citizen responses to industrial development and the ways in which they viewed the environment "revealed how deeply American ideals and tastes conflicted with the need to oversee industrialism."[11] Framing urban environmental issues in political (and industrial) terms caught my attention, since I had gone to the University of Texas to work with Robert A. Divine, a noted political and diplomatic historian. My newfound fascination with urban-industrial politics, ultimately environmental reform, was reinforced by a small circle of other students at Texas, who also began their graduate careers in traditional areas of history, but who were intrigued by the possibilities that environmental history offered, especially in the wake of the rising environmental movement in the early 1970s. The modern environmental movement was but one dimension of the social and political upheaval and change (civil rights, women's rights, gay rights, the antiwar movement) after World War II that were transforming the historical profession in the 1960s and 1970s.

In the spring of 1972 I participated in Morgan's unique research seminar on environmental history, choosing as my topic refuse disposal in industrial cities.

In my mind, there was nothing more graphic—and visceral—than garbage and rubbish in the grimy cities at the turn of the century. I was particularly interested to learn how urbanites reacted to such a basic problem and to what degree the presence of mounds of waste influenced their thinking about health matters and the environment. The research paper, and later article, focused on efforts by engineers, sanitarians, and civic groups to confront the waste issue, and it gave particular attention to Progressive Era reform. An interest in the aesthetic and technical dimensions of antipollution measures would permeate much of my later work, particularly through growing efforts to "civilize" cities by promoting programs of cleanliness and citizen participation and through efforts to make cities more rational, and thus to "manage" the environment by using technical and administrative measures to develop new municipal services and to reduce pollution.

In many respects, the political reform model for approaching urban environmental problems—in this case refuse—grew not only logically out of my own training as a political historian, but also by default. Available historical literature on the urban environment was quite thin or remained undiscovered by a fledgling researcher. For the most part, either out of sheer determination or a naive understanding of available sources, this early work on urban refuse gave primary attention to individuals and groups promoting public solutions to problems that had largely been handled privately before the late nineteenth century. While I made some effort to explain the variety of collection and disposal options available at the time, I paid scant attention to how municipal government functioned, how technologies evolved, the nature of urban fiscal policy, and to what extent new city services transformed urban space. This may have been too much to ask of a budding historian, but it is now clear how necessary it would become to place urban environmental issues in a broader framework than reform politics.[12]

My chronological limit for the study was the Progressive Era, approximately 1880–1920, when the reform spirit was at a fever pitch and contemporary sources on reform activity are abundant. I later would come to believe that the inordinate attention to Progressive Era environmental reform was somewhat of a morass for environmental historians or maybe just too seductive to escape. Few have been willing to venture beyond its chronological confines to find reform patterns in other eras, save possibly the rise of the environmental movement in the late 1960s and 1970s. More important, however, it would become necessary not to equate environmental issues with just one time period or to

restrict attention to rising and falling environmental "problems." The digging may be a little more difficult, but the subject demands a much wider gauge than the Progressive Era provides. Indeed, the need to abandon not only a rigid periodization, but too narrow a focus on environmental problems within one set of national borders, let alone a Western cultural bias, seems essential. Some of my cursory examinations of China, the subcontinent, the Middle East, and other parts of the world suggest that seeking to find the roots of urban environmental history in the United States or even in Europe is too myopic. If there is a redeeming value to attention to urban environmental issues in a single country, like the United States, it may be that these issues often possess qualities that naturally lead to comparisons with the experiences of others. In some important respects, environmental problems translate across national and cultural experiences.

I put aside my newfound interest in the urban environment in the mid-1970s to complete my dissertation on the Pearl Harbor investigations conducted after World War II. After all, I was still an aspiring diplomatic and political historian. However, the opportunity to return to matters urban and environmental presented itself when I got my first job at Texas A&M University. It became obvious to me—and to others—that I was just one of several diplomatic historians in my new department, and that I probably stood a greater chance of finding a professional niche if I turned in another direction. Fortunately, I was hoping to get the chance to revisit my work on urban waste. While my previous research had only skimmed the surface of the topic, I had received very positive reviews on my "garbage" article and found myself teaching at a technically oriented university, where library resources in this research area were strong. On receiving a substantial grant from the Rockefeller Foundation in the field of environmental studies, I began to map a plan to produce two new books: one that sampled a variety of urban pollution problems in historical perspective, and another that delved much more deeply into the urban waste issue.

These works emphasized a "problems" approach in dealing with the urban environment; that is, using pollution problems as organizing principles through which to evaluate the effects of industrialization and urban growth on the United States. In addition, the pollution problems could be linked to political reform efforts primarily in the Progressive Era—the antismoke and antinoise campaigns for example. These studies placed heavy emphasis on the relationship among urban growth, urban pollution, and industrialization. The

research implied a causal connection between industrialization and urban growth, urban growth and pollution, industrialization and pollution, and pollution and reform. Making such correlations proved valuable for raising issues rarely discussed in urban history or environmental history at that time. Subsequent years of additional study and reflection ultimately proved the tight little argument to be a little too pat, a little too rational, and a little too superficial, however.

While the study may not have been a mature piece of scholarship, it nonetheless had substantive merit. It turned attention to aspects of urban development that had been little appreciated. At the time, several historians were still using the city as a backdrop for examining an array of social and political issues. *Pollution and Refor m* turned attention to infrastructure, technical change, and city services—the physical city, albeit through the narrow prism of political reform. That historians would tackle urban pollution problems was a novel idea, and it eventually helped to broaden the discourse in the burgeoning field of environmental history as well as to provide a unique vantage point for studying the history of technology. Of course in the late 1970s and early 1980s, such topics remained on the fringe of both environmental history and urban history, and historians of technology sometimes referred to such endeavors in pejorative terms as "low-tech" studies.

In structuring *Pollution and Reform in American Cities* I forged ahead with the problems approach, creating chapter headings on water supply, smoke, sewerage, refuse, and noise.[13] Since the book was to have a focus on reform efforts, I also believed that key groups—especially women civic reformers and municipal engineers—deserved special attention. I wrote the chapter on refuse and took a stab at writing an introduction on the relationship between industrialization, urbanization, and pollution. However, I did not feel confident in my own abilities to write essays on the other topics. I turned to the few senior people I had heard about who studied the urban environment—Joel Tarr, Stanley Schultz, and Clay McShane—and asked them to reprise some of their recent work on topics relevant to the book. To my surprise, they agreed. I also sought out a few younger scholars—Dale Grinder, Suellen Hoy, Raymond Smilor, Stuart Galishoff—who also were addressing specific pollution and/or reform issues like I was doing. *Pollution and Refor m* was well received in the reviews, and it was ultimately regarded as a seminal work in urban environmental history. In 1980, however, it was a book that existed in a relatively obscure subfield of history, attracting some attention because of the focus on political reform in the

Progressive Era, but not ready to claim pioneer status. In recent years the study of pollution in a historical context has attracted greater attention than it did in the early 1980s. Urban historian Lynn Hollen Lees, in discussing the evolution of European urban history, suggested that the "concept of pollution can be turned in different ways. While on the one hand it points to specific processes and even to technologies of physical contamination, it can also alert us to contemporary notions of dirt and disorder. By exploring contemporaries' definitions of the unclean and unacceptable, we learn more about central urban values."[14]

Garbage in the Cities grew out of my seminar work at Texas and *Pollution and Reform*.[15] As such, much of the focus remained on political reform in the Progressive Era. Working on this project, however, advanced my interest in the urban environment in three important ways. I began to view "decision making" as a more appropriate way to deal with the politics of pollution and city service development than limiting attention exclusively to political reform. In essence, I adopted a rather simplified version of interest-group politics that was widely discussed in the social science literature, but that I had not read at the time. How engineers, sanitarians, and civic leaders interacted with the urban bureaucracy became more important, as did the ways in which private enterprises become public ones. I asked, How did contracted street cleaning and garbage collection/disposal become public responsibilities? I also became more aware of the intrinsic value of the types and styles of technology—what I later would call the "technologies of sanitation"—in bringing about changes in the urban environment and the quality of services offered. Such devices as compaction trucks and street sweeping equipment, as well as disposal techniques such as incinerators and sanitary landfills, became important players in my story, rivaling my previous attention to reform politics. Little by little, political reform was taking a back seat to a broader rendering of a key urban environmental problem. My focus was increasingly on the structure of government, the role of government in service delivery, fiscal policy, and the function of technical expertise in the construction, maintenance, and operation of services. All of this was informed by the work of others, especially the ubiquitous Joel Tarr, whose work gave me a real appreciation for the need to understand the physical city, to appreciate the technical limits of city services, and to give sufficient attention to the central role of municipal engineers in constructing and maintaining urban infrastructure.[16]

Although *Garbage in the Cities* emphasized the period 1880–1920, much like

my earlier work, I tacked on a rather breezy final chapter that carried the story to 1980. Joel Tarr had often warned me to avoid a presentist approach to my research on the urban environment, that is, to understanding the environmental issues of the past in the context of their time. However, I also came to realize, as did he, that the history of urban pollution problems resonated in the debates of the present. The trick was trying to determine how evidence from the historical past informed current issues. In the last chapter of *Garbage in the Cities* I discussed government regulation, changing technologies, and institutional change (privatization, for example) in the years since 1920 with an eye to how views had changed about the problem of solid waste. From that time forward I never doubted the policy implications of studying the urban-industrial environment. Urban environmental history has clear value as an historical discipline, to be sure, but it generates many ideas and issues that are found in the public discourse in the late twentieth century, including issues of health, pollution threats, the infrastructure crisis, the proper role of government in delivery services, and privatization of services. I also have come to realize that such a pragmatic interest in the urban environment sometimes requires straying from a more theoretical or abstract interest in the urban ecosystem—the city as an anthill—but the duality between the theoretical and the practical remains part of my work and the work of others in the field to this day. History can serve both ends.

After the publication of *Garbage in the Cities,* I sought rather desperately to escape the image of a "garbage historian," turning my attention to energy issues. I was not simply fleeing from the urban environment, but was attracted to a topic very much in the news, especially in the wake of the energy crisis of the 1970s. As I later came to realize, I was drawn to the energy issue because of my interest in the impact of the Industrial Revolution on the United States—in which energy resources played a major part—and because of a more generalized interest in the relationship between resource development and consumption. My studies of the urban waste problem had first stimulated an interest in what material goods people prized and what they discarded as worthless, choices that were possible in a society noted for its abundance and affluence. I had been struck by the fact that one of the most affluent nations in the world was also one of the most wasteful, a seeming juxtaposition of affluence and effluents.

The issue of energy raised similar issues. Particularly graphic in the 1970s were the humbling experiences of gasoline shortages and brownouts—even so

briefly—panicking one of the great energy-producing and energy-generating societies of the world. *Coping with Abundance* was my major effort to explore the development of wood, coal, petroleum, electrical, and nuclear power throughout American history, to link energy development to the processes of industrialization, and to comment on the environmental implications of resource extraction, power production, and energy consumption. I also tried to periodize the study by outlining energy transitions from wood to coal and from coal to petroleum as a way to assess production and consumption patterns and to explain the process of economic modernization.[17]

Researching and writing *Coping with Abundance* and several related articles provided me with a deeper understanding of industrial processes and the uses of natural resources, but it only scratched the surface in exploring the energy/environment nexus beyond some of the most obvious effects. The study of energy nonetheless deepened my understanding of American habits of consumption and made me aware of a wider range of environmental risk than I had learned about in studying the solid waste problem and other forms of urban pollution. Similarly, I turned to explaining policy issues, especially government regulation, in order to link the historical evidence to present concerns. As I argued in the introduction to *Coping with Abundance,*

> The United States was blessed with abundant energy sources throughout its history. . . . Abundance affected the way Americans used energy, how businesses developed and marketed it, and how government established policies about it. While bestowing many benefits, the array of energy sources posed problems of choice. The *luxury of choice* was preferable to the *necessity to choose,* but it often proved a curse when policy makers tried to arrive at coherent and comprehensive energy policies or strategies. The energy history of the United States, therefore, has been an ongoing effort to cope with abundance."[18]

The book was national in scope, however, and devoted scant attention to cities. A book I wrote several years later, *Thomas A. Edison and the Modernization of America,* allowed me to explore electrification and industrialization more fully, but also returned me to my interest in urban growth and development.[19] The primary thesis of the book was that Edison produced his inventions in and for an urbanized society. I was convinced more than ever that to understand modern America was to appreciate the process of urbanization.

The emphasis on energy and industrialization mirrored my previous work on urban pollution and industrialization. At the time, these correlations seemed to offer an appropriate construct, one that emphasized major changes

in the environmental orientation in the United States due primarily to its transformation from a rural, agrarian society into an urban, industrial one. The major implication was that industrialization spawned a wide variety of pollution problems particularly endemic to cities (directly through smoke, industrial wastes, and water pollution, and indirectly through urban growth and congestion), leading to an "environmental crisis." In the case of energy, it shifted production toward coal and petroleum, with consequent environmental implications. Focus on industrialization had merit, certainly because of the profound variety of changes brought on by the Industrial Revolution, reinforced in the historical literature through books such as Samuel P. Hays's *Response to Industrialism, 1885–1914* (Chicago: University of Chicago Press, 1957).

In more recent years, however, I have come to believe that the correlation between industrialization and pollution—or necessarily the advent of an environmental crisis—is too rigid and does not take into consideration a broad range of variables that both precedes and postdates industrialization. Making industrialization the prime culprit in modern pollution production and environmental degradation of various types—a core reason for something as dramatic as a crisis—is monocausal. It ignores other factors, including but not limited to agricultural cultivation, transmittal of epidemic diseases, a variety of technical choices in the nonindustrial sectors of society, and urban processes not attributable to industrialization.

In the same sense, industrialization alone or even in part was not necessarily responsible for the impulse to improve the urban environment of the late nineteenth and early twentieth centuries. In many cases, for example, new forms of city service (improved water supplies, sewerage systems, and so forth) appeared in American cities before the advent of industrialization in those areas. My focus in the 1970s and 1980s on industrialization and pollution was a useful device, but overemphasized. In some respects, I had been seduced by the powerful work of Lewis Mumford, whose critique of industrialization had so influenced me in the 1970s.[20]

In the mid- to late 1980s, I concentrated on some traditional issues of urban growth using Dallas-Fort Worth and Houston as case studies. A book chapter and bibliographic essay on Dallas-Forth Worth dealt with questions of politics and economic change, while an article on Houston focused more on the process of growth.[21] While the Houston research did not concentrate on pollution issues or service delivery as it would in a later study, developing an under-

standing of how a modern automobile city grew and how it contended with sprawl was useful research for later work focusing on the delivery of key environmental services.[22]

In the early 1990s I also gave considerable attention to more current issues related to urbanization. I continued to see important correlations between the historical record and the modern urban scene. Understanding housing patterns, changes in fiscal policy, and the impact of growth on public policy formation demonstrate the value of history as a policy tool. As I argued in *Urban Public Policy,* "The complexities of urban public policy are such that the ability of historical research to examine long trend lines, to offer carefully crafted analogies, and to provide historical perspective gives urban policy history value. The problem becomes not producing useful studies, but finding ways to get them into the hands of policymakers."[23]

Building on my historical work on solid waste, I wrote several pieces with a policy focus that confronted such issues as the evolution of the legal concept of environmental liability and the problem of hazardous waste; the distinction between a "garbage crisis" with immediate short-term impact and chronic waste problems that are more difficult to remedy in the long run; and the preference for one type of disposal technology versus another—namely the use of incinerators and sanitary landfills. In all of these cases, the primary motive was to demonstrate how knowledge of the historical issues in the nineteenth and twentieth centuries could inform contemporary policy.[24]

While very little of my work has been comparative in nature, that is, across national boundaries, I have devoted considerable time to sharing my experiences with respect to urban growth, the development of city services, and the environmental consequences of urbanization and energy use with colleagues and students in Europe, Canada, Mexico, and elsewhere.[25] In many respects, environmental history—particularly urban environmental history—translates well across national boundaries. While cultures and governments vary widely, urban pollution problems, growth issues, and the need for services are common concerns.

The American experience, while hardly typical in several respects, offers useful parallels. More particularly, American urban environmental historians have been, as a group, the most productive in the world, and the books and articles they have produced on a wide range of topics are read and used by professionals in several countries. Scholarly productivity is advancing rapidly in some countries, however. France, for example, has produced good scholarship

on urban and environmental planning. Nordic countries have a burgeoning literature on the urban environment. Scholars in many other countries are also beginning to contribute valuable works.[26]

Language remains one of the chronic barriers to sharing information, however, especially for Americans with little training in or inclination to study other languages. Some European and Latin American scholars have published in English, but many more have not. The common concerns of urban and industrial development are nonetheless providing a focus for scholarship that may blossom more fully in the early twenty-first century, especially with the help of the Internet.

My growing interest in comparative history in the 1990s has been matched by greater attention to the social and cultural implications of urban environmental history. In my early work, I devoted considerable attention to political reform, and to a much lesser degree, to the role of women reformers. Race, class, and gender issues were largely missing, however. The blossoming of social history in the past three decades and its influence in several subdisciplines in the field has not, until quite recently, manifested itself in environmental history.[27] In particular, reading *Ecopopulism,* sociologist Andrew Szasz's study of grassroots antitoxic protesters after Love Canal, showed me how vital issues of race, class, and gender had become in the evolution of the environmental movement.[28]

In order to inform myself better on race, class, and gender issues, I began modest research and writing on the environmental justice movement of the 1980s and 1990s. As a historian, I came to understand that it was important to look back beyond the more recent debates over siting toxic facilities to determine the degree to which certain groups had been subject to greater environmental risks than others and who actually had a voice in environmental protests. My explorations have been somewhat preliminary, focusing on the origins of the environmental justice movement, the role of grassroots protest to toxic issues, and the notion of the cultural construction of environmental views and values.[29] This latter point is extremely important and connects effectively with the need to understand how humans view nature in general and urban environments in particular.

As my own work has ranged more broadly over industrialization and urban development, energy issues, the environmental movement, and cross-cultural and cross-national themes, the need to deepen my understanding of the theoretical foundations of urban ecology and environmental history has become

more essential. In seeking to research and write a major study of sanitary services—water supply, wastewater, and solid waste collection and disposal—I did not want simply to tell the story of their development and use. I particularly wanted to broaden my understanding of the role that these services played in altering and influencing the shape of the urban infrastructure and their consequent impact on urban growth, public health, and the quality of urban life. To begin this undertaking, I was fortunate enough to secure a major grant from the National Endowment for the Humanities in 1988 that allowed me to study the interconnection among water supply, wastewater, and solid waste collection and disposal in the United States, and to consider the broader intellectual context in which these sanitary services were devised and implemented. The resulting product was *The Sanitary City,* a book that examined the development and implementation of these three services. It also raised questions about the nature of the urban environment and the correlation between decisions to use certain kinds of "technologies of sanitation" and the prevailing public health and environmental views that inform those decisions.[30]

In writing the book and in preparing several preliminary essays, I turned to works in sociology, geography, political science, and economics to mine theories concerning urban growth, urban ecology, systems development, and decision making. Through my research and writing, I gave major attention to the ecological theory of urban growth first developed by the Chicago School in the 1920s; systems theory, which describes how technical systems are designed and how they function; and path dependence theory, which postulates that initial decisions made—in this case on selecting particular technologies of sanitation—constrain future choices. These issues will be discussed in greater depth in subsequent chapters.[31]

As I said in the introduction to *The Sanitary City,* service delivery is a hidden function of cities because, "It often blends so invisibly into the urban landscape; it is part of what we expect a city to be. While economic forces are essential to the formation of cities in the United States, urban growth depends heavily on service systems that shape the infrastructure and define the quality of life." I also suggested, "Sanitary services are important vehicles for revealing contemporary environmental thought as it relates to urban life and city development. They are linked inextricably to prevailing public health and ecological theories and practices, which have played a large part in the timing of their implementation and in determining their form."[32] In others words, public health theories such as the miasmatic—or filth—theory and the bacteriological

theory of disease or ecological ideas informed the decisions made about the type and extent of sanitary service to be used. Technologies did not drive decisions for these services, ideas about their health and environmental effects did. Within this context, I tried to move beyond an essentially descriptive discussion of urban environmental problems and political reform and to focus on the root causes of environmental service delivery and decision-making processes to help explain important components of the urban matrix. To broaden this analysis, I intend to write a companion volume to *The Sanitary City* in the next several years that treats communication, transportation, and energy systems in an American urban setting. It is tentatively titled *The Networked City*. Essentially, I am attempting to construct, in historical terms at least, a more elaborate anthill—confronting urban ecology through the development of city services, the rationale for their implementation, and how they affect growth.

Effluent America, in one sense at least, traces my own intellectual journey into the realm of urban ecology from a historian's vantage point. On a more concrete level, the book presents a series of essays that examines the urban-industrial history of the United States from a variety of perspectives, some quite specific, others more speculative. Moreover, while they may not provide all of the answers, cumulatively chapters of this book may help to broaden thinking, even a little, about the urban environment and its place in the larger context of environmental history.